SUPERSERVER®
SYS-2029U-MTNRV



USER'S 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 this server. Installation and maintenance should be performed by experienced technicians only.

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

Notes

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

- Supermicro product manuals: http://www.supermicro.com/support/manuals/
- Product drivers and utilities: https://www.supermicro.com/wdl
- Product safety info: https://www.supermicro.com/about/policies/safety_information.cfm

If you have any questions, please contact our support team at:
support@supermicro.com

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

Secure Data Deletion

A secure data deletion tool designed to fully erase all data from storage devices can be found on our website: https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wdl/utility/Lot9_Secure_Data_Deletion_Utility/

Warnings

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



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



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

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Chapter 1

Introduction

1.1 Overview

This chapter provides a brief outline of the functions and features of the SYS-2029U-MTNRV server. It is based on the X11DPU-V motherboard and the SC-219ULTS-R1K62P chassis.

Key Applications include 5G Core and Edge, Telecom Micro Data Center, Network Function Virtualization, Cloud Computing, and High End Enterprise Server.

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**
Power supply modules, AC or DC	PWS-1K62A-1R PWS-1K30D-1R	2 2
Backplane	BPN-NVME4-HE211N-S6	1
Fans	FAN-0214L4	6
Air Shrouds	MCP-310-21911-0B	2
Heatsinks	SNK-P0069PS	2
Riser cards	RSC-R2UW-4E8 RSC-UMR-8	1 each
Rack mount rails	MCP-290-00058-0N	1 set

Ultra Riser Networking Options			
LAN Ports	**Part Number**	**Description**	
Two 10Gb SFP+	AOC-2UR68-I2XS	Intel 82599ES controller with two SFP+ ports, plus three PCIe 3.0 slots: one internal x8, one x16, and one x8 (in x16 slot)	
Two 10Gbase-T	AOC-2UR68-I2XT	Intel X540 controller with two RJ45 ports, plus three PCIe 3.0 slots: one internal x8, one x16, and one x8 (in x16 slot)	
Four 1GbE	AOC-2UR68-I4G	Intel i350AM4 controller with four RJ45 ports, plus two PCIe 3.0 x16 slots	
Four 1GbE	AOC-2UR66-I4G	Intel i350 controller with four RJ45 ports, plus two PCIe 3.0 x16 slots	
Four 10Gbase-T	AOC-2UR66-I4XTF	Intel XL710-BM1 and Intel X557-AT4 controllers with four RJ45 ports, plus two PCIe 3.0 x16 slots	
Two 25GbE SFP28	AOC-2UR68-M2TS-O	Mellanox CX-4 Lx EN controller with two SFP28 ports, plus three PCIe 3.0 slots: one internal x8, one x16, and one x8 (in x16 slot)	

1.2 System Features

The following table is an overview of the main features of the SYS-2029U-MTNRV server.

System Features
Motherboard
X11DPU-V
Chassis
SC-219ULTS-R1K62P
CPU
Dual Intel Xeon Scalar Processor, Gen 1 & 2 (in Socket P (LGA3647)). For the latest CPU/memory updates, refer to our website at http://www.supermicro.com/products/motherboard/Xeon/C620/X11DPU-V.cfm
Memory
Twenty-four slots for up to 6 TB of 3DS Load Reduced DIMM (3DS LRDIMM), 3DS Registered DIMM (3DS RDIMM), or up to 3 TB of Load Reduced DIMM (LRDIMM) with speeds of up to 2933 MHz; support for Non-Volatile DIMM (NVDIMM) and Intel Optane DC Persistent Memory (DCPMM)
Chipset
Intel C621
Expansion Slots
Eight PCIe 3.0: Four full-height, 10.5" x8 One full-height, 10.5" x16 One full-height, 10.5" x8 (in x16) One low-profile x8 + two M.2 One internal low-profile x8 (Ultra riser)
Storage Drives
Six 2.5" hybrid hot-swap drive bay for NVMe/SAS/SATA *(Optional)* M.2: Up to two PCIe M.2 or two SATA3 M.2
Power
1600W redundant 80Plus Titanium level modules; (optional) 1300W DC power supplies
Cooling
Six 6-cm heavy duty fans, two CPU heatsinks, two air shrouds to direct air flow
Input/Output
USB 3.0: Two ports on the rear I/O panel (USB 0/1) One serial port; one VGA port
LAN ports
Two, four or zero, depending on the Ultra riser card model; see previous page for details One dedicated BMC port
Form Factor
2U short-depth rackmount; (WxHxD) 17.2 x 3.5 x 22.6 in. (437 x 89 x 574 mm)

1.3 Chassis Features

Control Panel

Power switches and status LEDs are located on the control panel on the front of the chassis.

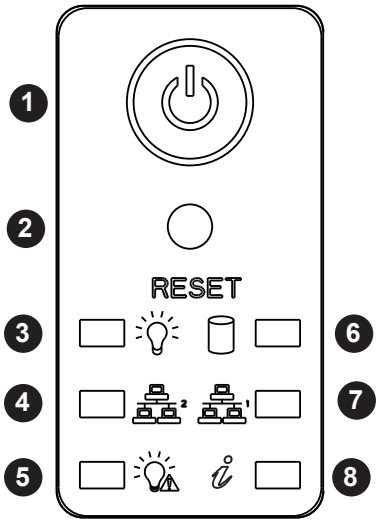


Figure 1-1. Control Panel

Control Panel Features		
Item	**Features**	**Description**
1	Power button	The main power switch applies or removes primary power from the power supply to the server but maintains standby power.
2	Reset button	Reboots the system.
3	Power LED	Indicates power is being supplied to the system power supply units. This LED is illuminated when the system is operating normally.
4	NIC LED	Indicates network activity on LAN2 when flashing.
5	Power Fail LED	Indicates a power supply module has failed.
6	HDD LED	Indicates activity on the hard drive when flashing.
7	NIC LED	Indicates network activity on LAN1 when flashing.
8	Information LED	Alerts operator to several states, as noted in the table below

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.
Blinking red (0.25Hz)	Power failure, check for a non-operational power supply.

Information LED	
Status	**Description**
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.

Chassis Front

The illustration below shows the features included on the front of the chassis. Externally accessible hard drive carriers display status lights.

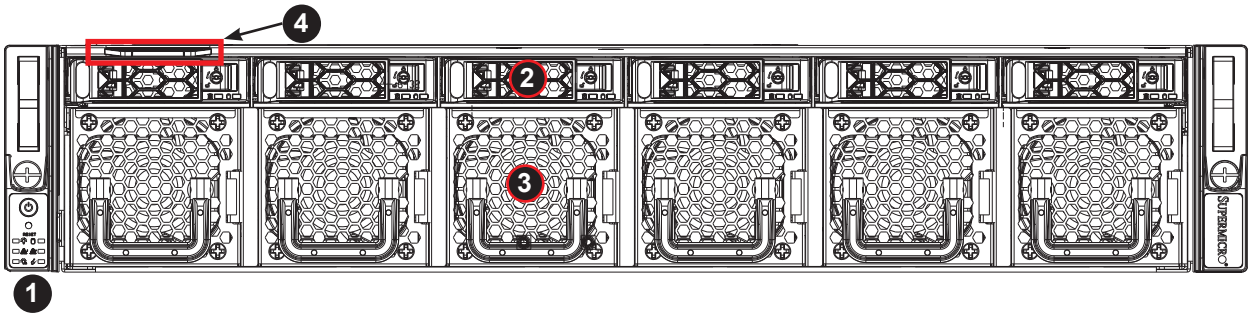
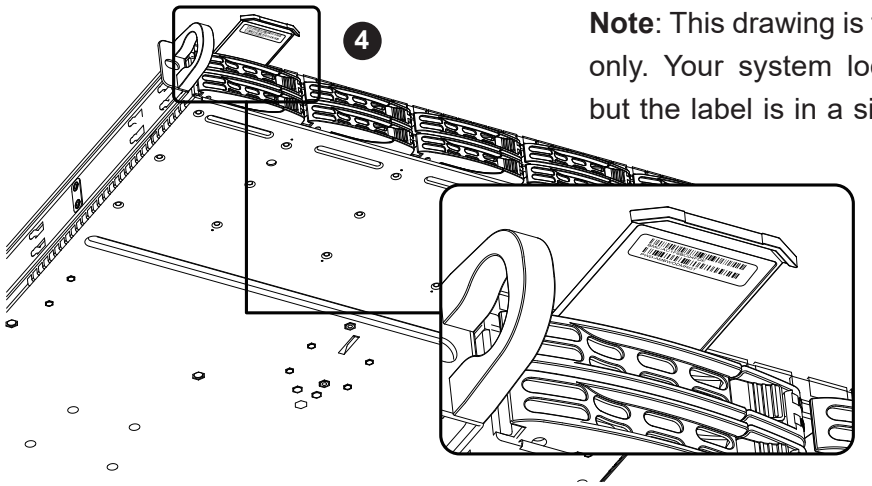


Figure 1-2. Front View

Chassis Front Features		
Item	**Features**	**Description**
1	Control Panel	Power buttons and status indicators
2	Storage Drives	Six 2.5" drive bays; see the "Storage Drive" section in Section 3.4 for details
3	Fans	Six heavy duty 6-cm PWM fans
4	Service/Asset Tag	Pull-out identifier (with BMC ADMIN default password sticker)



Note: This drawing is for illustration only. Your system looks different, but the label is in a similar place.

Figure 1-3. Location of the BMC Password Label

Chassis Rear

The illustration below shows the features included on the rear of the chassis. Power supply modules display status lights.

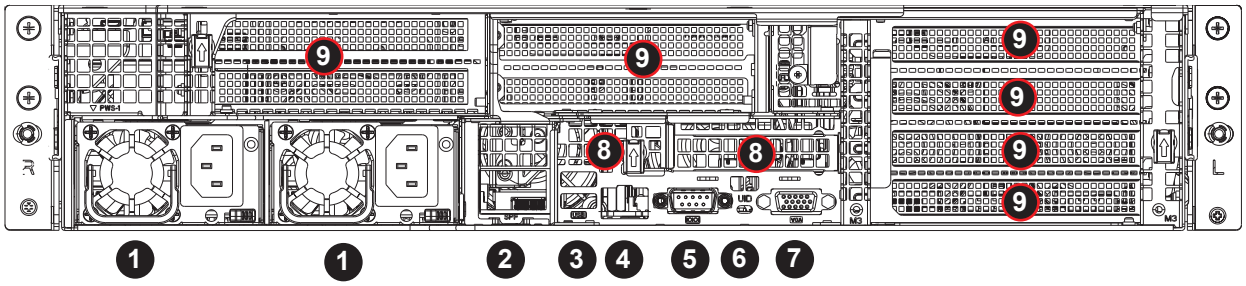


Figure 1-4. Rear View

Chassis Rear Features		
Item	**Features**	**Description**
1	Power Supply	Two redundant power supply modules, PWS1 on the left, PWS2 on the right
2	LAN	Two or four LAN ports, depending on your Ultra riser card (see Section 1.1 Overview for details; also see LAN numbering description below)
3	USB	Two USB 3.0 ports
4	BMC LAN	Dedicated LAN port for BMC
5	COM	Serial port
6	UID	UID indicator and button to toggle the UID indicators
7	VGA	Video port
8	PCI	Two PCIe low-profile slots
9	PCI	Six PCIe full-height slots

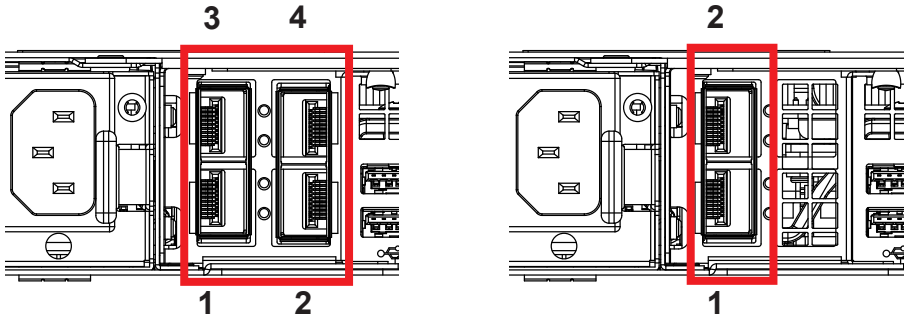


Figure 1-5. LAN Numbering

1.4 Motherboard Layout

Below is a layout of the X11DPU-V 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.

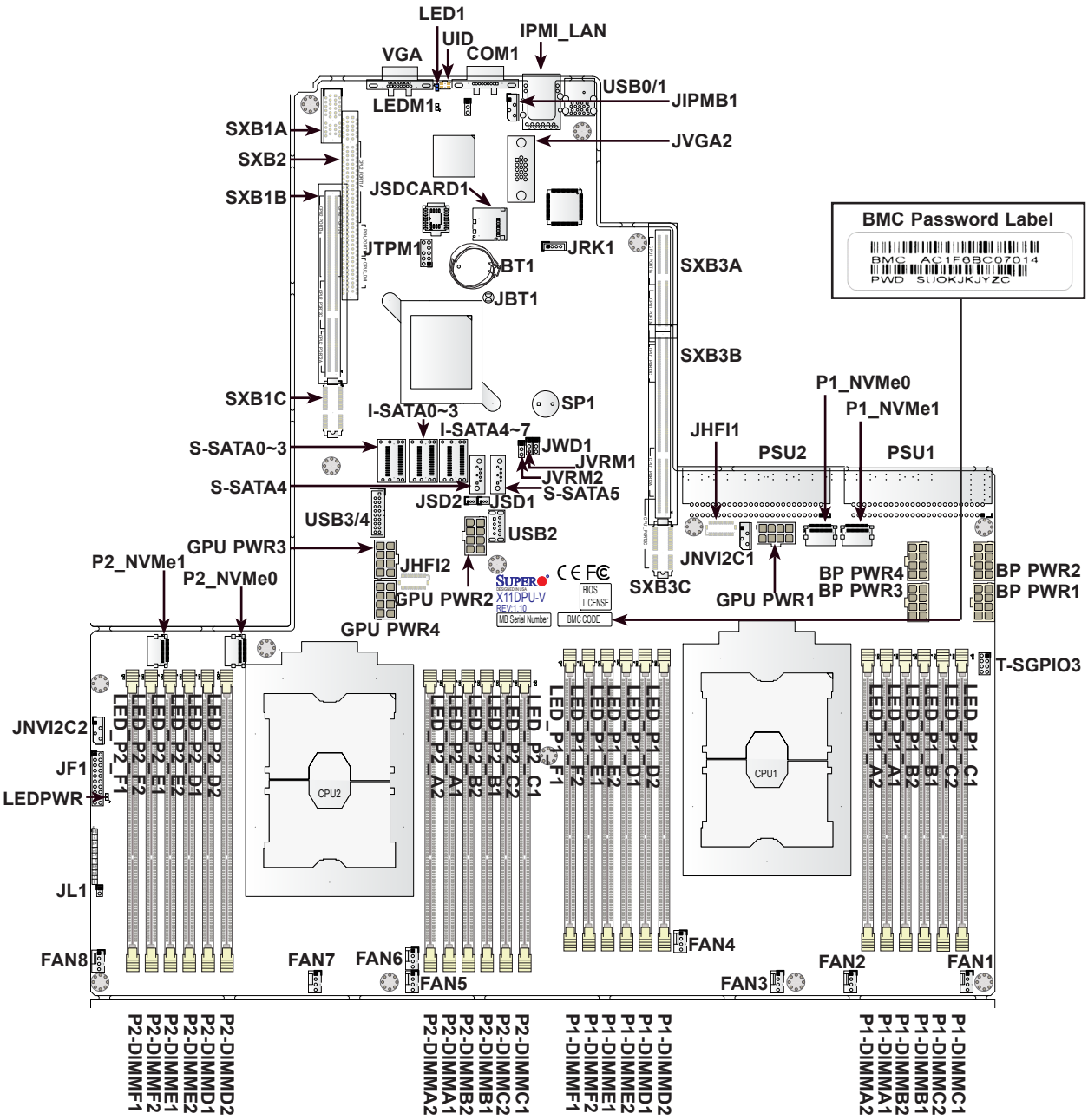


Figure 1-6. Motherboard Layout

Quick Reference

Jumper	Description	Default Setting
JBT1	CMOS Clear	Open (Normal)
JWD1	Watch Dog	Pins 1-2 (Reset)

Connector	Description
BP PWR1/2/3/4	8-pin power connectors 1/2/3/4 for backplane use
BT1	Onboard battery
COM1	COM port (COM1) on the I/O backplane
FAN1 - FAN8	System/CPU fan headers
GPU PWR1/2/3/4	8-pin power connectors 1/2/3/4 used for GPU devices
IPMI_LAN	Dedicated IPMI LAN Port
I-SATA0-3, I-SATA4-7	Intel PCH SATA 3.0 ports (0-3, 4-7)
JF1	Front control panel header
JHFI1/JHFI2	Host Fabric Interface sideband connection headers—not supported in this system
JIPMB1	4-pin BMC external IC header (for an IPMI card)
JL1	Chassis intrusion header
JNVI²C1/2	NVMe SMBus (I²C) headers used for PCIe hot-plug SMBus clock and data connections (a proprietary NVMe add-on card and cable are required; available only for Supermicro complete systems)
JRK1	RAID_Key for onboard NVMe devices
JSD1/JSD2	SATA DOM power connectors 1/2
JSDCARD1	Micro SD card slot (reserved for manufacture use)
JTPM1	Trusted Platform Module/Port 80 connector
JUIDB2	UID (Unit Identifier) switch
JVGA2	Front VGA Port
JVRM1/JVRM2	VRM I2C headers
P1_NVMe0/1 & P2_NVMe0/1	Non-Volatile Memory Express (NVMe) 3.0 devices 0/1 supported by CPU1 & CPU2
PSU1/PSU2	Power Supply Unit (PSU) Connector 1/Power Supply Unit Connector 2
S-SATA0-3	SATA 3.0 ports 0-3 supported by Intel SCU chip
S-SATA4/S-SATA5	SATA3.0 ports with power-pin built-in w/support of SuperDOM (Device-On Module)
SP1	Internal speaker/buzzer
SXB1A/SXB1B/SXB1C	PCIe 3.0 (x16 + x16) slot supported by CPU2 for proprietary riser card (w/left riser card support)
SXB2	PCIe 3.0 x8 (in x16) slot supported by CPU2 for center right riser card support
SXB3A/SXB3B/SXB3C	PCIe 3.0 (x16 + x16 + x8) slot from CPU1 for far_right ultra riser (SAS3 AOM & LAN options)
T-SGPIO3	Serial_Link General Purpose I/O header for S-SATA4/5
USB0/1	Backplane Universal Serial Bus (USB) 3.0 ports 0/1
USB3/4	Front Accessible USB 3.0 header for USB 3/4 connections
USB2	USB 3.0 Type A Header
VGA	VGA Port

LED	Description	State: Status
LED1	UID (Unit Identifier) LED	Solid Blue: Unit Identified
LEDM1	BMC Heartbeat LED	Blinking Green: BMC Normal
LEDPWR	Onboard Power LED	Solid Green: Power On
Memory LED	**Description**	**Status**
LED_P1_A1/LED_P1_A2	Memory Fault LEDs for Memory Module P1_A1/Memory Module P1_A2	Solid Red: Memory Error
LED_P1_B1/LED_P1_B2	Memory Fault LEDs for Memory Module P1_B1/Memory Module P1_B2	Solid Red: Memory Error
LED_P1_C1/LED_P1_C2	Memory Fault LEDs for Memory Module P1_C1/Memory Module P1_C2	Solid Red: Memory Error
LED_P1_D1/LED_P1_D2	Memory Fault LEDs for Memory Module P1_D1/Memory Module P1_D2	Solid Red: Memory Error
LED_P1_E1/LED_P1_E2	Memory Fault LEDs for Memory Module P1_E1/Memory Module P1_E2	Solid Red: Memory Error
LED_P1_F1/LED_P1_F2	Memory Fault LEDs for Memory Module P1_F1/Memory Module P1_F2	Solid Red: Memory Error
LED_P2_A1/LED_P2_A2	Memory Fault LEDs for Memory Module P2_A1/Memory Module P2_A2	Solid Red: Memory Error
LED_P2_B1/LED_P2_B2	Memory Fault LEDs for Memory Module P2_B1/Memory Module P2_B2	Solid Red: Memory Error
LED_P2_C1/LED_P2_C2	Memory Fault LEDs for Memory Module P2_C1/Memory Module P2_C2	Solid Red: Memory Error
LED_P2_D1/LED_P2_D2	Memory Fault LEDs for Memory Module P2_D1/Memory Module P2_D2	Solid Red: Memory Error
LED_P2_E1/LED_P2_E2	Memory Fault LEDs for Memory Module P2_E1/Memory Module P2_E2	Solid Red: Memory Error
LED_P2_F1/LED_P2_F2	Memory Fault LEDs for Memory Module P2_F1/Memory Module P2_F2	Solid Red: Memory Error

System Block Diagram

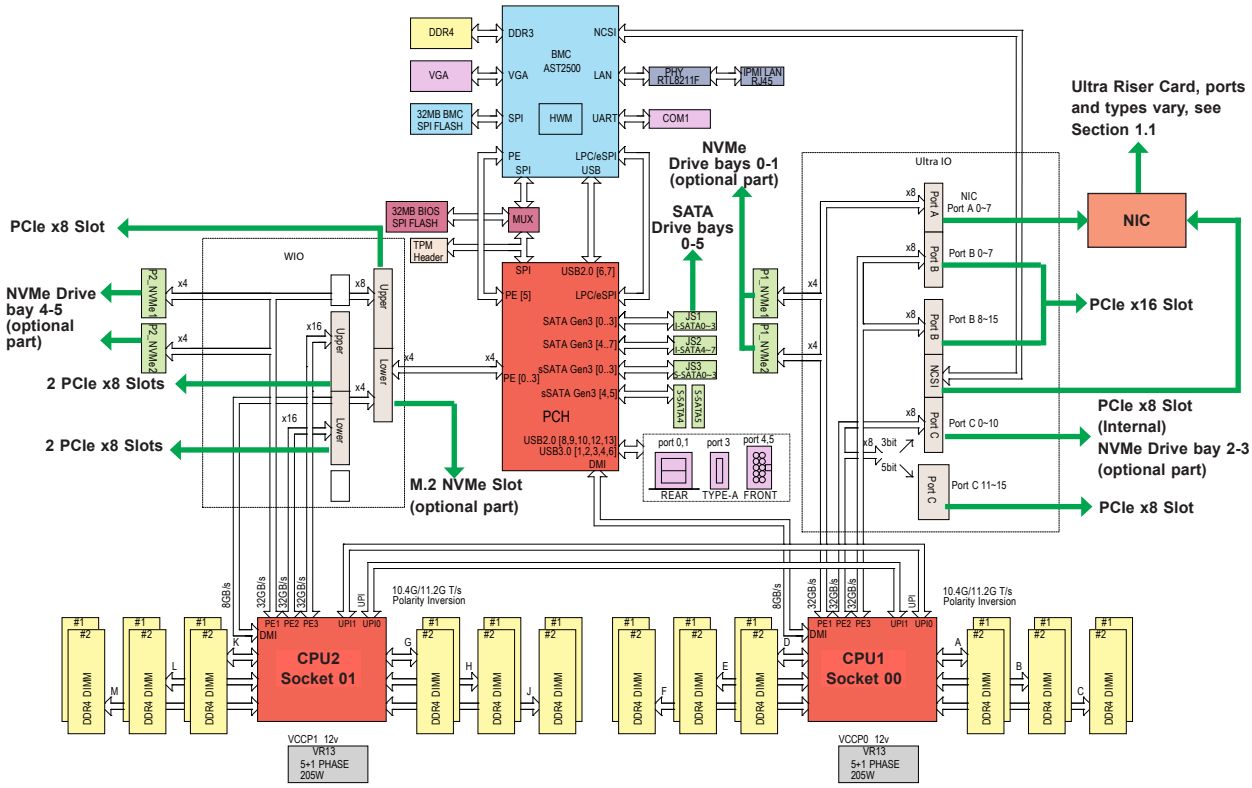


Figure 1-7. System Block Diagram

1.5 Unpacking the System

Inspect the box the system 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.

1.6 Where to Get Replacement Components

If you need replacement parts for your system, to ensure the highest level of professional service and technical support, purchase exclusively from our Supermicro Authorized Distributors/System Integrators/Resellers. A list can be found at: http://www.supermicro.com. Click the "Where to Buy" link.

1.7 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

For faster service, RMA authorizations may be requested online (http://www.supermicro.com/support/rma/).

Whenever possible, repack the chassis in the original Supermicro carton, using the original packaging material. If these are no longer available, be sure to pack the chassis securely, using packaging material to surround the chassis so that it does not shift within the carton and become damaged during shipping.

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alteration, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

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 acccording 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.

2.3 Installing the Rails

There are a variety of rack units on the market, which may require a slightly different assembly procedure. This rail set fits a rack between 26.8" and 36.4" deep.

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

Identifying the Rails

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

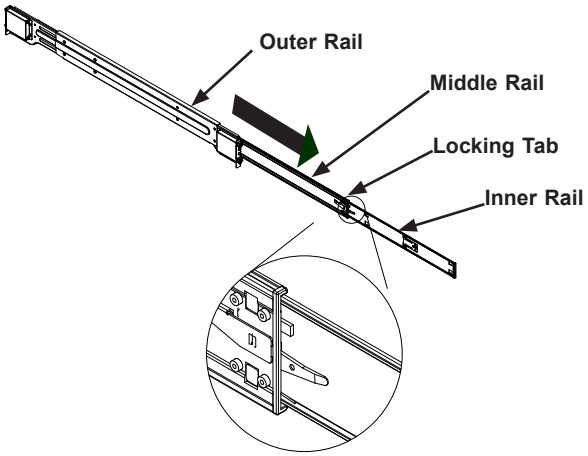


Figure 2-1. Identifying the Outer Rail, Middle Rail and Inner Rail
(Left Rail Assembly Shown)

Releasing the Inner Rail

Each inner rail has a locking latch. This latch prevents the server from coming completely out of the rack when when the chassis is pulled out for servicing.

To mount the rail onto the chassis, first release the inner rail from the outer rails.

1. Pull the inner rail out of the outer rail until it is fully extended as illustrated below.
2. Press the locking tab down to release the inner rail.
3. Pull the inner rail all the way out.

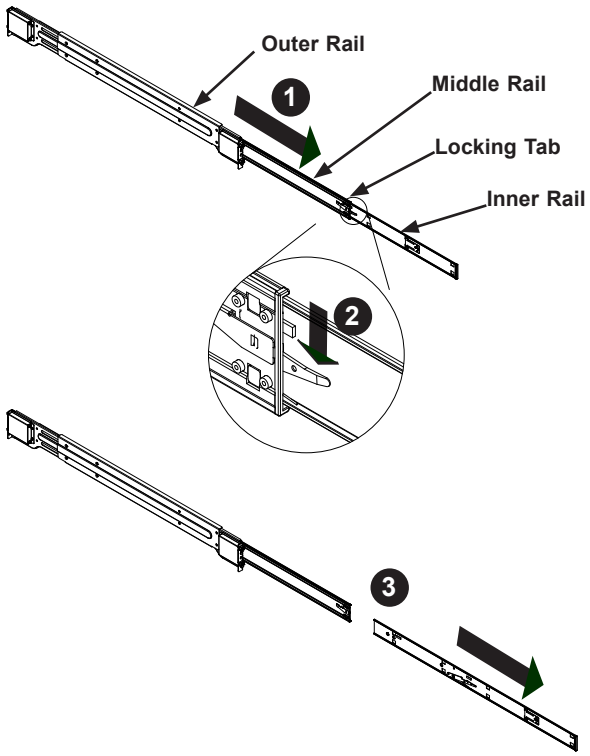


Figure 2-2. Extending and Releasing the Inner Rail

Installing the Inner Rails on the Chassis

Installing the Inner Rails

1. Identify the left and right inner rails. They are labeled.
2. Place the inner rail firmly against the side of the chassis, aligning the hooks on the side of the chassis with the holes in the inner rail.
3. Slide the inner rail forward toward the front of the chassis until the quick release bracket snaps into place, securing the rail to the chassis.
4. Optionally, you can further secure the inner rail to the chassis with screws.

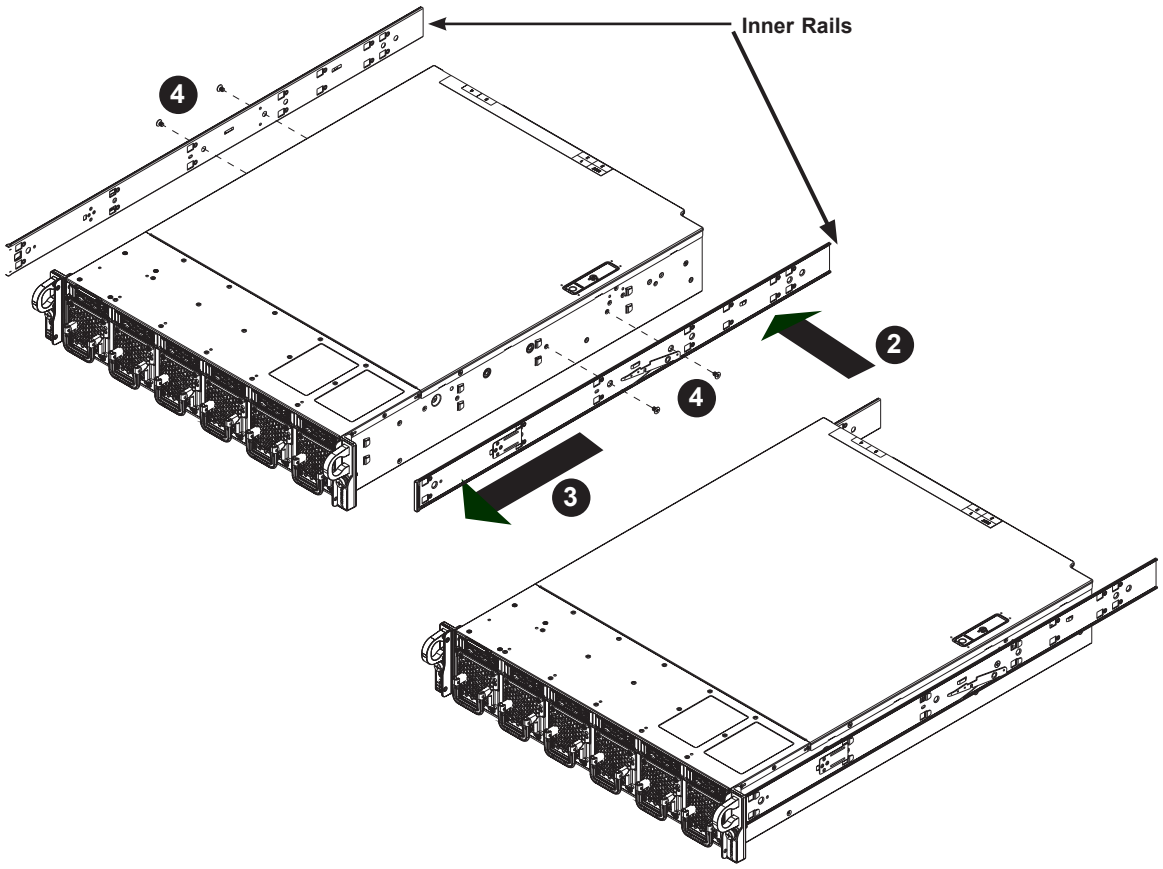


Figure 2-3. Installing the Inner Rails

Installing the Outer Rails onto the Rack

Each end of the assembled outer rail includes a bracket with hooks and square, spring-loaded pegs to fit into the square holes in your rack.

Installing the Outer Rail

1. Press upward on the locking tab at the rear end of the middle rail.
2. Push the middle rail back into the outer rail.
3. Hang the hooks on the front of the outer rail onto the square holes on the front of the rack. If desired, use screws to secure the outer rails to the rack.
4. Pull out the rear of the outer rail, adjusting the length until it just fits within the posts of the rack.
5. Hang the hooks of the rear section of the outer rail onto the square holes on the rear of the rack. Take care that the proper holes are used so the rails are level. If desired, use screws to secure the rear of the outer rail to the rear of the rack.

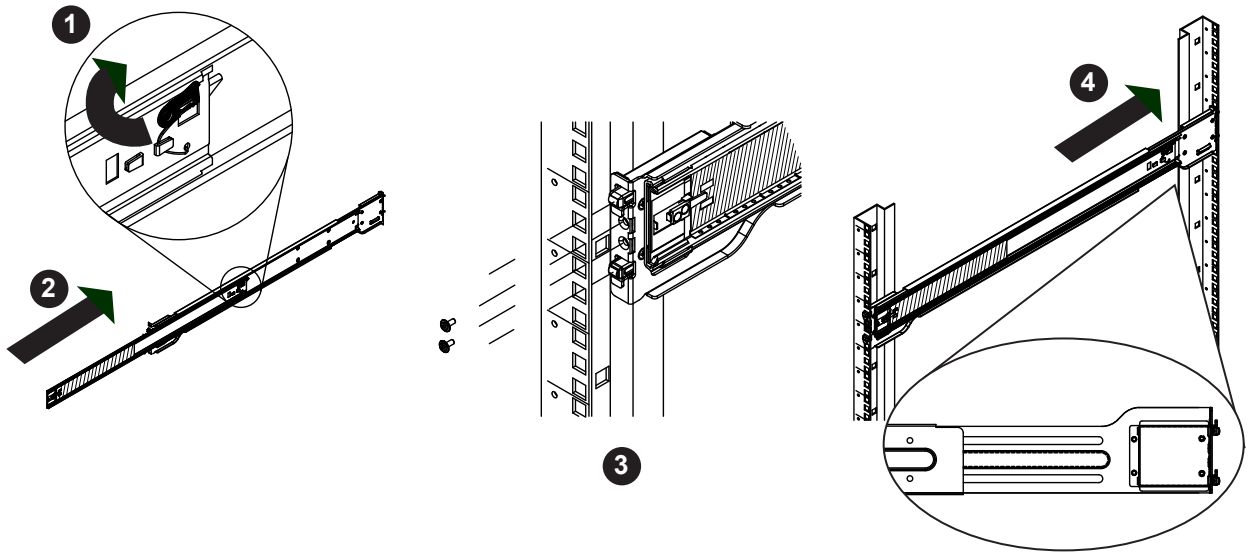


Figure 2-5. Extending and Mounting the Outer Rails

Note: The figure above is for illustrative purposes only. Always install servers at the bottom of the rack first.

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

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

2.4 Installing the Chassis into a Rack

Once rails are attached to the chassis and the rack, you can install the server.

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

Installing the Chassis into a Rack

1. Extend the outer rails as illustrated, figure on next page.
2. Align the inner rails of the chassis with the outer rails on the rack.
3. Slide the inner rails into the outer rails, keeping the pressure even on both sides. When the chassis has been pushed completely into the rack, it should click into the locked position.
4. Optional screws may be used to hold the front of the chassis to the rack.

Removing the Chassis from the Rack

Caution! The system is heavy. It is dangerous for a single person to remove it from the rack. Have sufficient personnel or use a lift to support the chassis.

1. Pull the chassis forward out the front of the rack until it stops.
2. Press the release latches on each of the inner rails downward simultaneously and continue to pull the chassis forward and out of the rack.

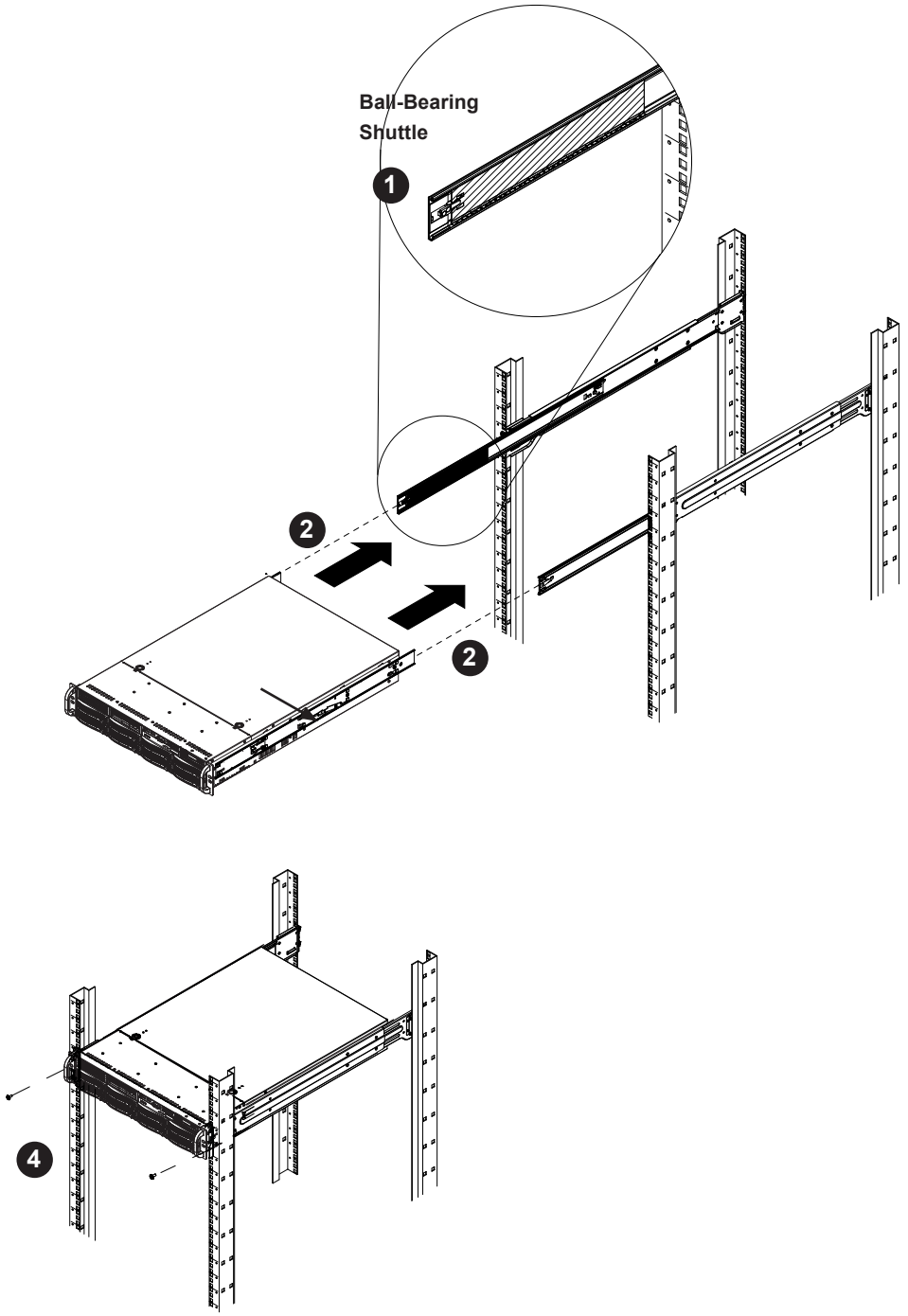


Figure 2-6. Installing the Server into the Rack

Note: Keep the ball bearing shuttle locked at the front of the middle rail during installation.

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 SC219U chassis has a removable top cover to access internal components.

Removing the Top Cover

1. Remove the screws on each side of the cover, which secure the cover to the chassis.
2. Lift the locking latch, then slide the cover toward the rear and lift off.

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

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

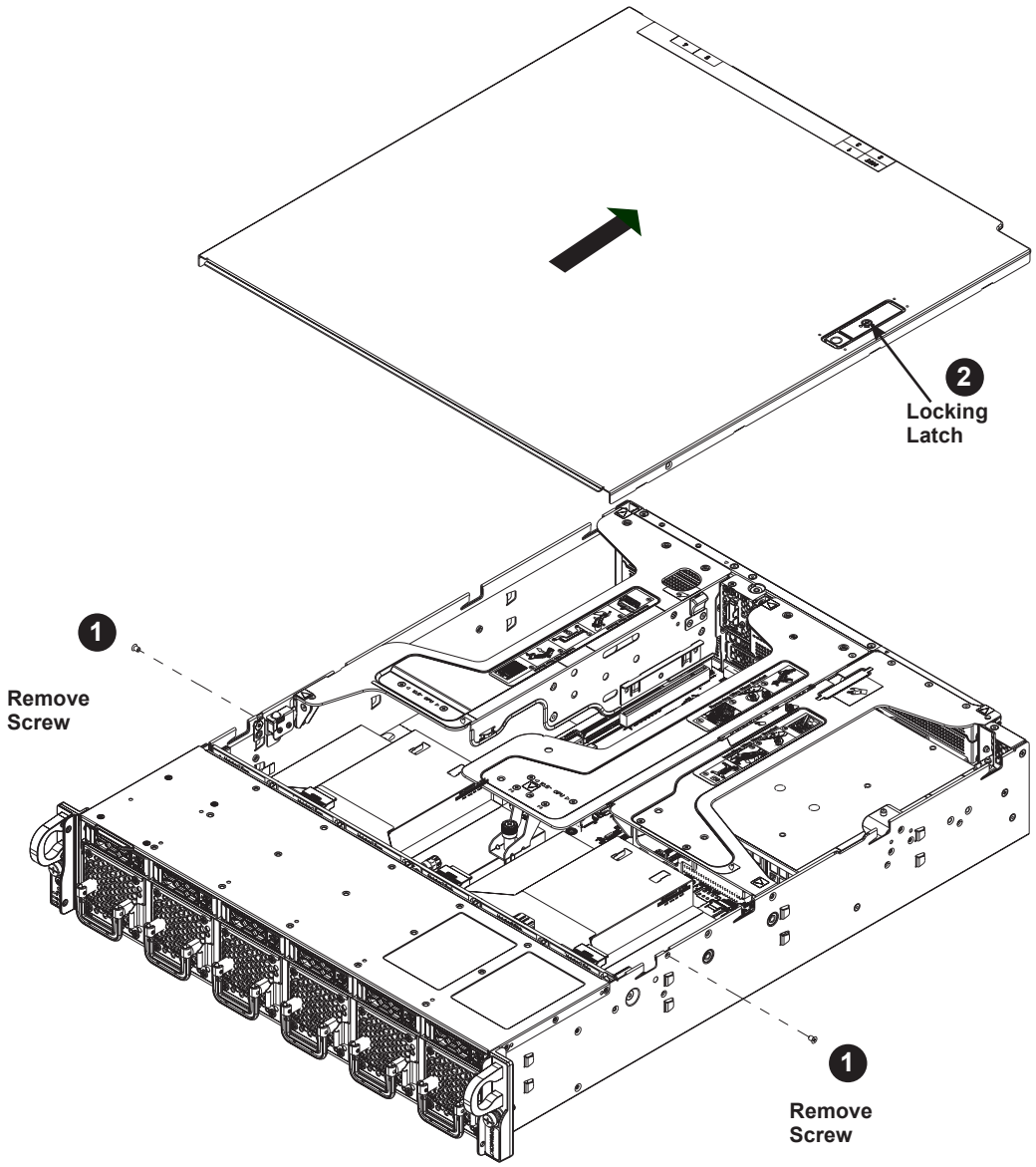


Figure 3-1. Removing the Chassis Cover

Bezel

The 2029U-MTNRV has an optional front bezel. An air filter is not recommended to allow greater air flow.



Figure 3-2. Front Bezel

Removing the Bezel

1. Use the key to unlock the bezel from the chassis.
2. Press the red lever and pull the bezel off.

Replacing the Bezel

1. Insert the two mounting pins on the left of the bezel into the holes in the tab on the chassis (see following drawing).
2. Push and hold the release lever while pushing the bezel onto the chassis front, then release the lever to secure the bezel.
3. Lock the bezel if desired.

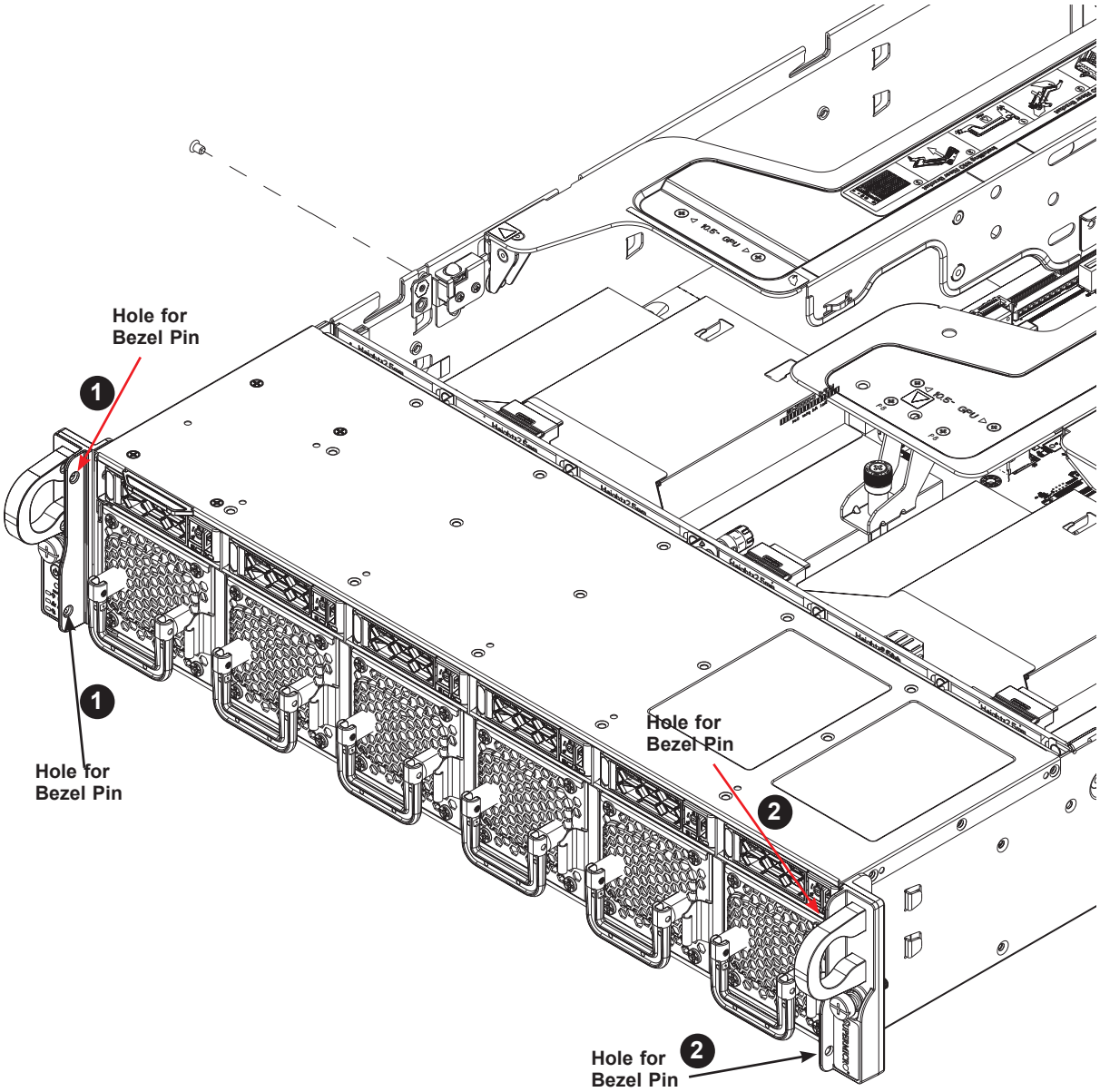


Figure 3-3. Chassis Tabs for Installing the Bezel

3.3 Motherboard Components

Processor and Heatsink Installation

The processor (CPU) and processor carrier should be assembled together first to form the processor carrier assembly. This will be attached to the heatsink to form the processor heatsink module (PHM) before being installed onto the CPU socket.

Notes:

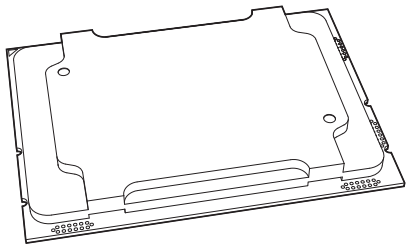
- Use ESD protection.
- Unplug the AC power cord from all power supplies after shutting down the system.
- Check that the plastic protective cover is on the CPU socket and none of the socket pins are bent. If they are, contact your retailer.
- When handling the processor, avoid touching or placing direct pressure on the LGA lands (gold contacts). Improper installation or socket misalignment can cause serious damage to the processor or CPU socket, which may require manufacturer repairs.
- Thermal grease is pre-applied on a new heatsink. No additional thermal grease is needed.
- Refer to the Supermicro website for updates on processor support.
- All graphics in this manual are for illustration only. Your components may look different.

The Processor

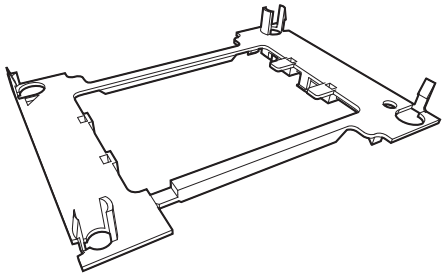
The Intel Xeon Scalar Processor, Gen 1 & 2 series comes in two models: Fabric (F Model) and Non-Fabric (Non-F Model). Only the Non-Fabric model is supported for this system.

The Processor Carrier Assembly

The processor carrier assembly is the processor and a plastic carrier.



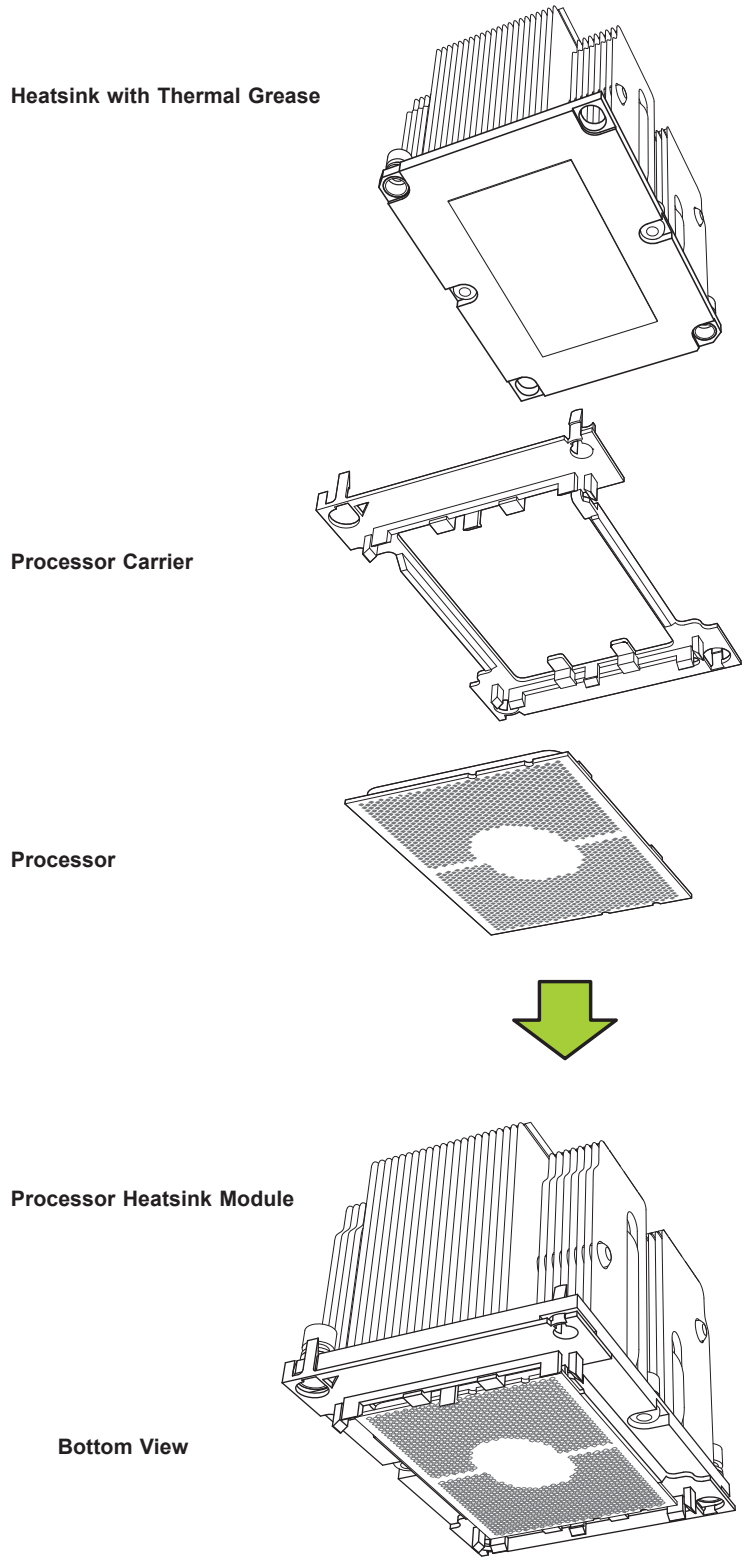
Processor



Processor Carrier

Overview of the Processor Heatsink Module

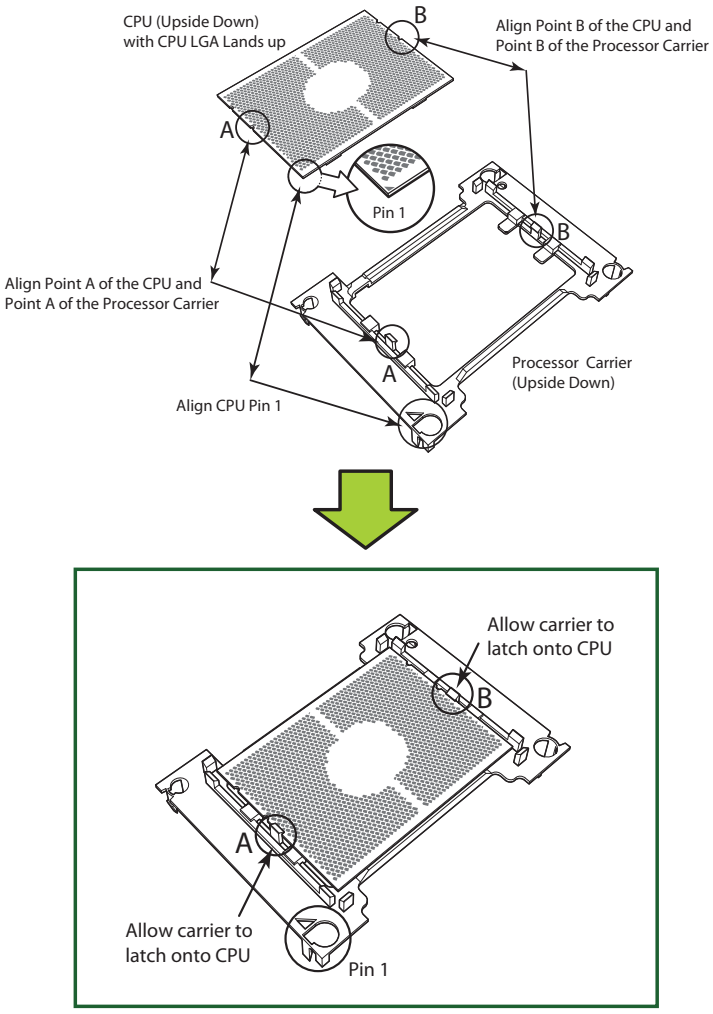
The Processor Heatsink Module (PHM) contains a heatsink, a processor carrier, and the processor.



Creating the Processor Carrier Assembly

To install a processor into the processor carrier, follow the steps below:

1. Hold the processor with the LGA lands (gold contacts) facing up. Locate the small, gold triangle in the corner of the processor and the corresponding hollowed triangle on the processor carrier. These triangles indicate pin 1. See the images below.
2. Using the triangles as a guide, carefully align and place Point A of the processor into Point A of the carrier. Then gently flex the other side of the carrier for the processor to fit into Point B.
3. Examine all corners to ensure that the processor is firmly attached to the carrier.



Processor Carrier Assembly

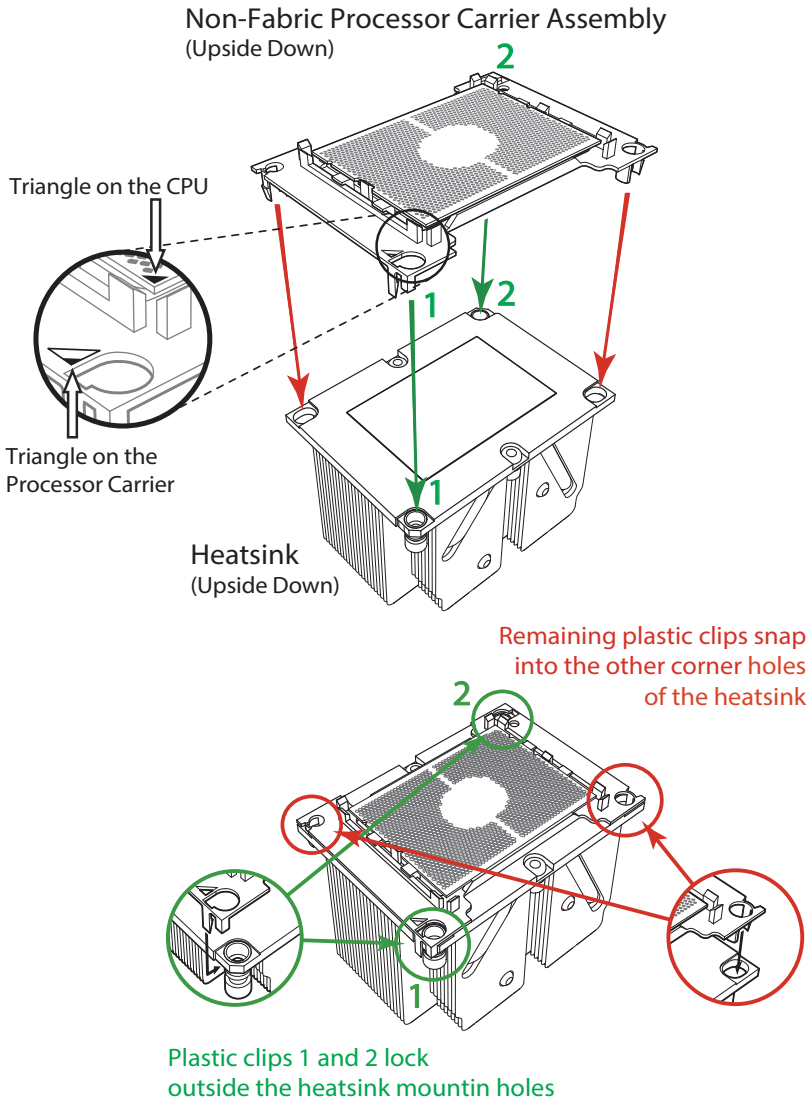
Assembling the Processor Heatsink Module

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

1. Note the label on top of the heatsink, which marks the heatsink mounting holes as 1, 2, 3, and 4. If this is a new heatsink, the thermal grease has been pre-applied on the underside. Otherwise, apply the proper amount of thermal grease.

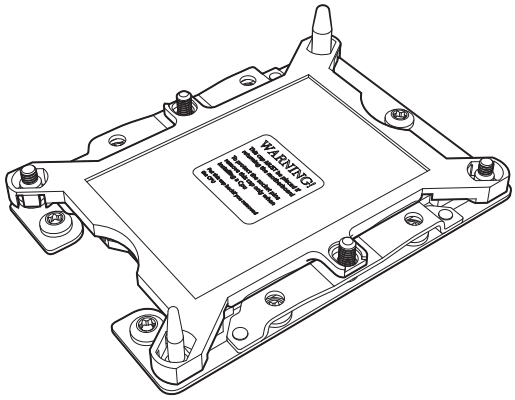
2. Turn the heatsink over with the thermal grease facing up. Hold the processor carrier assembly so the processor's gold contacts are facing up, then align the triangle on the assembly with hole 1 of the heatsink. Press the processor carrier assembly down. The plastic clips of the assembly will lock outside of holes 1 and 2, while the remaining clips will snap into their corresponding holes.

3. Examine all corners to ensure that the plastic clips on the processor carrier assembly are firmly attached to the heatsink.

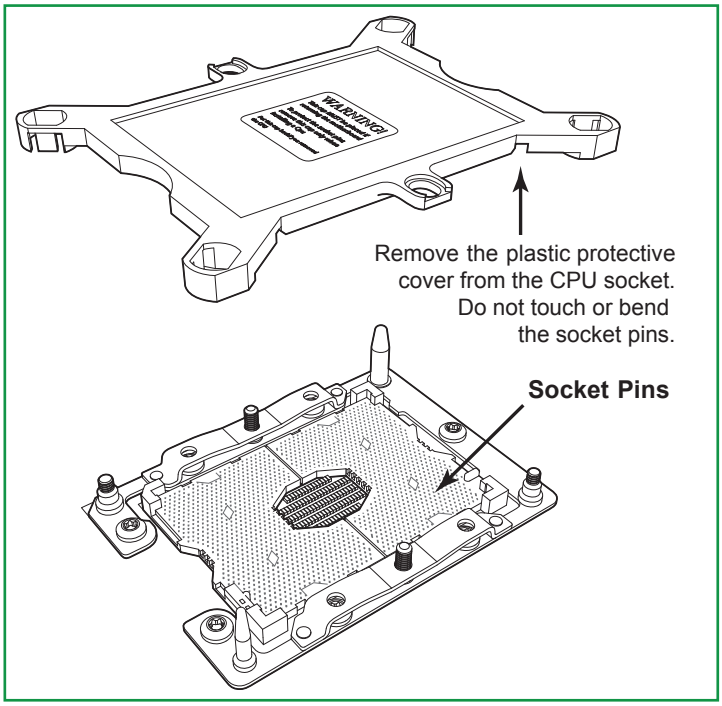


Preparing the CPU Socket for Installation

This motherboard comes with a plastic protective cover on the CPU socket. Remove it carefully to install the Processor Heatsink Module (PHM).



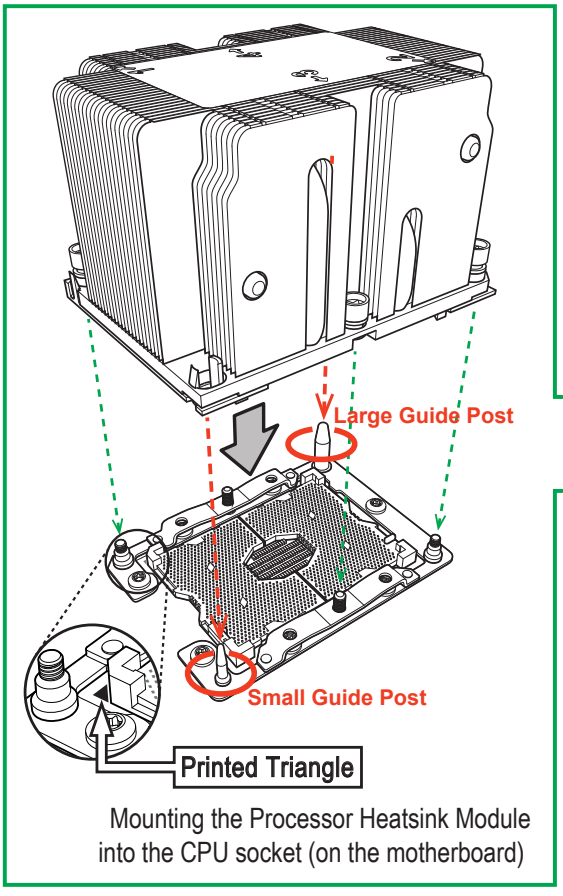
CPU Socket with Plastic Protective Cover



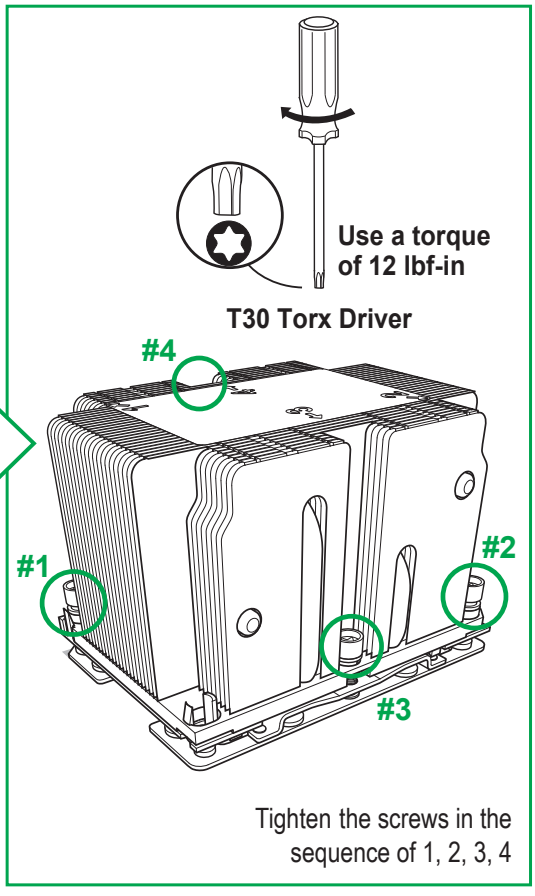
Installing the Processor Heatsink Module

After assembling the Processor Heatsink Module (PHM), install it onto the CPU socket:

1. Align hole 1 of the heatsink with the printed triangle on the CPU socket. See the left image below.
2. Make sure all four holes of the heatsink are aligned with the socket before gently placing the heatsink on top.
3. With a T30 Torx-bit screwdriver, gradually tighten screws #1 – #4 to assure even pressure. The order of the screws is shown on the label on top of the heatsink. To avoid damaging the processor or socket, do not use a force greater than 12 lbf-in when tightening the screws.
4. Examine all corners to ensure that the PHM is firmly attached to the socket.



Mounting the Processor Heatsink Module into the CPU socket (on the motherboard)



Tighten the screws in the sequence of 1, 2, 3, 4

If at any time the PHM must be removed, power off, then loosen the screws in the sequence of #4, #3, #2, and #1.

Memory

Memory Support

The X11DPU-V has 24 DIMM slots for up to 6 TB of 3DS Load Reduced DIMM (3DS LRDIMM), 3DS Registered DIMM (3DS RDIMM), or up to 3 TB of Load Reduced DIMM (LRDIMM) with speeds of up to 2933 MHz. In addition it supports Non-Volatile DIMMs (NV-DIMM) and Intel Optane DC Persistent Memory (DCPMM).

DDR4 Memory Support for 81xx/61xx/51xx/41xx/31xx Processors						
Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s)		
				One Slot per Channel	Two Slots per Channel	
		DRAM Density		One DIMM per Channel	One DIMM per Channel	Two DIMMs per Channel
		4 Gb	8 Gb	1.2 Volts	1.2 Volts	1.2 Volts
RDIMM	SRx4	4 GB	8 GB	2666	2666	2666
	SRx8	8 GB	16 GB			
	DRx8	8 GB	16 GB			
	DRx4	16 GB	32 GB			
RDIMM 3Ds	QRX4	N/A	2H-64GB			
	8RX4	N/A	4H-128GB			
LRDIMM	QRx4	32 GB	64 GB			
LRDIMM 3Ds	QRx4	N/A	2H-64GB			
	8Rx4	N/A	4H-128 GB			

DDR4 Memory Support for 82xx/62xx/52xx/42xx/32xx Processors							
Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)			Speed (MT/s)		
					One Slot per Channel	Two Slots per Channel	
		DRAM Density			One DIMM per Channel	One DIMM per Channel	Two DIMMs per Channel
		4 Gb*	8 Gb	16 Gb	1.2 Volts	1.2 Volts	1.2 Volts
RDIMM	SRx4	4 GB	8 GB	16 GB	2933**	2933**	2933**
	SRx8	8 GB	16 GB	32 GB			
	DRx8	8 GB	16 GB	32 GB			
	DRx4	16 GB	32 GB	64 GB			
RDIMM 3Ds	QRX4	N/A	2H-64GB	2H-128GB			
	8RX4	N/A	4H-128GB	4H-256GB			
LRDIMM	QRx4	32 GB	64 GB	128 GB			
LRDIMM 3Ds	QRx4	N/A	2H-64GB	2H-64GB			
	8Rx4	N/A	4H-128 GB	4H-256 GB			

*4Gb DRAM density is only supported on speeds up to 2666 MT/s

**Only the 82xx and 62xx series support 2933 MT/s; for other processors, memory speed as supported by the CPU.

Check the Supermicro website for possible updates to memory support.

Memory Population Guidelines

- All DIMMs must be DDR4.
- Balance memory. Using unbalanced memory topology, such as populating two DIMMs in one channel while populating one DIMM in another channel, reduces performance. It is not recommended for Supermicro systems.
- In dual-CPU configurations, memory must be installed in the slots associated with the installed CPUs.

Guidelines Regarding Mixing DIMMs

- Populating slots with a pair of DIMM modules of the same type and size results in interleaved memory, which improves memory performance.
- Use memory modules of the same type and speed, as mixing is not allowed.
- x4 and x8 DIMMs can be mixed in the same channel.
- Mixing of LRDIMMs and RDIMMs is not allowed in the same channel, across different channels, and across different sockets.
- Mixing of non-3DS and 3DS LRDIMM is not allowed in the same channel, across different channels, and across different sockets.

DIMM Construction

- RDIMM (*non-3DS*) Raw Cards: A/B (2Rx4), C (1Rx4), D (1Rx8), E (2Rx8)
- 3DS RDIMM Raw Cards: A/B (4Rx4)
- LRDIMM (*non-3DS*) Raw Cards: D/E (4Rx4)
- 3DS LRDIMM Raw Cards: A/B (8Rx4)

Memory Population Sequence

Blue slots versus black slots: Install the first DIMM in the blue memory slot, which is the first of a memory channel. Then, if using two DIMMs per channel, install the second DIMM in the black slot.

The following memory population sequence table was created based on guidelines provided by Intel to support Supermicro motherboards. The diagram is for illustrative purposes; your motherboard may look different.

Memory Population for the X11 DP Motherboard, 24 DIMM Slots	
CPUs/DIMMs	**Memory Population Sequence**
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*	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*	CPU1: P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/P1-DIMMD1/P1-DIMME1/ P1-DIMMF1
1 CPU & 8 DIMMs	CPU1: P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/P1-DIMMD2/P1-DIMMD1/ P1-DIMME2/P1-DIMME1
1 CPU & 9 DIMMs*	CPU1: P1-DIMMC1/P1-DIMMC2/P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/ P1-DIMMD1/P1-DIMME1/P1-DIMMF1
1 CPU & 10 DIMMs*	CPU1: P1-DIMMC1/P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/ P1-DIMMD2/P1-DIMMD1/P1-DIMME2/P1-DIMME1/P1-DIMMF1
1 CPU & 11 DIMMs*	CPU1: P1-DIMMC1/P1-DIMMC2/P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/ P1-DIMMD2/P1-DIMMD1/P1-DIMME2/P1-DIMME1/P1-DIMMF1
1 CPU & 12 DIMMs	CPU1: P1-DIMMC1/P1-DIMMC2/P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/ P1-DIMMD2/P1-DIMMD1/P1-DIMME2/P1-DIMME1/P1-DIMMF2/P1-DIMMF1
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	CPU1: P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/P1-DIMMD2/P1-DIMMD1/ P1-DIMME2/P1-DIMME1 CPU2: P2-DIMMC1/P2-DIMMB1/P2-DIMMA1/P2-DIMMD1/P2-DIMME1/P2-DIMMF1
2 CPUs & 16 DIMMs	CPU1: P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/P1-DIMMD2/P1-DIMMD1 /P1-DIMME2/P1-DIMME1 CPU2: P2-DIMMB1/P2-DIMMB2/P2-DIMMA1/P2-DIMMA2/P2-DIMMD2/P2-DIMMD1 /P2-DIMME2/P2-DIMME1
2 CPUs & 18 DIMMs	CPU1: P1-DIMMC1/P1-DIMMC2/P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/ P1-DIMMD2/P1-DIMMD1/P1-DIMME2/P1-DIMME1/P1-DIMMF2/P1-DIMMF1 CPU2: P2-DIMMC1/P2-DIMMB1/P2-DIMMA1/P2-DIMMD1/P2-DIMME1/P2-DIMMF1
2 CPUs & 20 DIMMs	CPU1: P1-DIMMC1/P1-DIMMC2/P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/ P1-DIMMD2/P1-DIMMD1/P1-DIMME2/P1-DIMME1/P1-DIMMF2/P1-DIMMF1 CPU2: P2-DIMMB1/P2-DIMMB2/P2-DIMMA1/P2-DIMMA2/P2-DIMMD2/P2-DIMMD1/ P2-DIMME2/P2-DIMME1
2 CPUs & 22 DIMMs*	CPU1: P1-DIMMC1/P1-DIMMC2/P1-DIMMB1/P1-DIMMB2/P1-DIMMA1/P1-DIMMA2/ P1-DIMMD2/P1-DIMMD1/P1-DIMME2/P1-DIMME1/P1-DIMMF1 CPU2: P2-DIMMC1/P2-DIMMC2/P2-DIMMB1/P2-DIMMB2/P2-DIMMA1/P2-DIMMA2/ P2-DIMMD2/P2-DIMMD1/P2-DIMME2/P2-DIMME1/P2-DIMMF1
2 CPUs & 24 DIMMs	CPU1: all slots CPU2: all slots

*Unbalanced, not recommended.

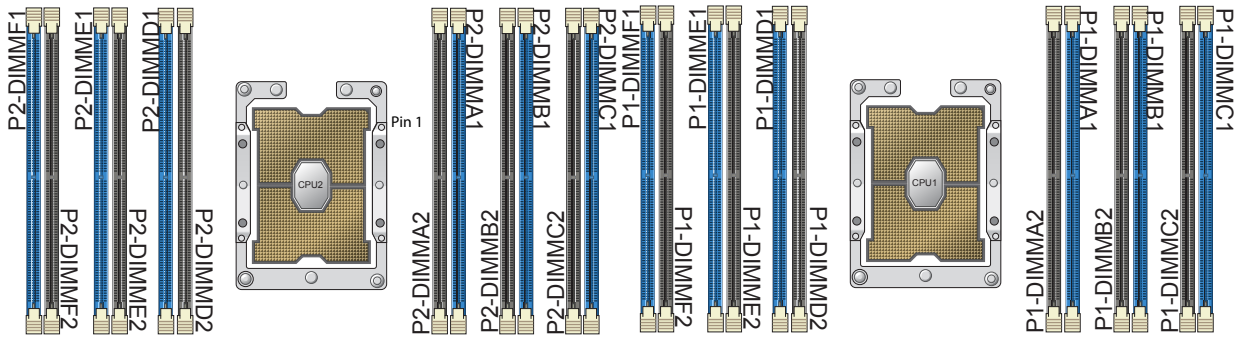


Figure 3-4. Memory Slots

DCPMM Population Table (24 Slots) based on the 82xx/62xx/52xx/42xx

Symmetric Population for Each CPU

DCP & DIMMs	Modes	P1/P2-DIMMF1	P1/P2-DIMMF2	P1/P2-DIMME1	P1/P2-DIMME2	P1/P2-DIMMD1	P1/P2-DIMMD2	P1/P2-DIMMA2	P1/P2-DIMMA1	P1/P2-DIMMB2	P1/P2-DIMMB1	P1/P2-DIMMC2	P1/P2-DIMMC1	Channel Config.
12 DCP 12 DIMM	AD	M1	DCP	M1	DCP	M1	DCP	DCP	M1	DCP	M1	DCP	M1	2-2-2
	MM	M1	DCP	M1	DCP	M1	DCP	DCP	M1	DCP	M1	DCP	M1	2-2-2
	AD + MM	M3	DCP	M3	DCP	M3	DCP	DCP	M3	DCP	M3	DCP	M3	2-2-2
4 DCP 12 DIMM	AD	M1	-	M1	-	M1	DCP	DCP	M1	-	M1	-	M1	2-1-1
	MM	M2	-	M2	-	M2	DCP	DCP	M2	-	M2	-	M2	2-1-1
	AD + MM	M3		M3	-	M3	DCP	DCP	M3	-	M3	-	M3	2-1-1
8 DCP 12 DIMM	AD	M1	-	M1	DCP	M1	DCP	DCP	M1	DCP	M1	-	M1	2-2-1
	MM	M1	-	M1	DCP	M1	DCP	DCP	M1	DCP	M1	-	M1	2-2-1
	AD + MM	M3	-	M3	DCP	M3	DCP	DCP	M3	DCP	M3	-	M3	2-2-1
4 DCP 8 DIMM	AD	DCP	-	M1	-	M1	-	-	M1	-	M1	-	DCP	1-1-1
	MM	DCP	-	M1	-	M1	-	-	M1	-	M1	-	DCP	1-1-1
	AD + MM	DCP	-	M3	-	M3	-	-	M3	-	M3	-	DCP	1-1-1
4 DCP 16 DIMM	AD	DCP	-	M1	M1	M1	M1	M1	M1	M1	M1	-	DCP	2-2-1

AD: App Direct, MM: Memory Mode, M1/M2/M3: DRAM (see Legend below)

Asymmetric Population for Each CPU

DCP & DIMMs	Modes	P1/P2-DIMMF1	P1/P2-DIMMF2	P1/P2-DIMME1	P1/P2-DIMME2	P1/P2-DIMMD1	P1/P2-DIMMD2	P1/P2-DIMMA2	P1/P2-DIMMA1	P1/P2-DIMMB2	P1/P2-DIMMB1	P1/P2-DIMMC2	P1/P2-DIMMC1	Channel Config.
2/1 DCP 12DIMM	AD	M1	-	M1	-	M1	-	DCP	M1	-	M1	-	M1	2/1-1-1
	AD*	M1	-	M1	-	M1	-	DCP	M1	-	M1	-	M1	2/1-1-1

*Second socket has no DCPMM

Legend (for the two tables above)

DDR4 Type					Capacity
M1	RDIMM	3DS RDIMM	LRDIMM	3DS LRDIMM	Any Capacity
M2	RDIMM	-	-	-	Refer to the Validation Matrix below.
M3	RDIMM	3DS RDIMM	LRDIMM	-	

Note: DDR4 single rank x8 is not available for DCP Memory Mode or App-Direct Mode.

Validation Matrix (DDR4 DIMMs Validated with DCPMM)

DIMM Type	Ranks Per DIMM & Data Width (Stack)	DIMM Capacity (GB)	
		DRAM Density	
		4Gb	8Gb
RDIMM	1Rx4	8GB	16GB
	2Rx8	8GB	16GB
	2Rx4	16GB	32GB
LRDIMM	4Rx4	N/A	64GB
LRDIMM 3DS	8Rx4 (4H)	N/A	128GB

Notes:

- For MM, general NM/FM ratio is between 1:4 and 1:16. Excessive capacity for FM can be used for AD. (NM = Near Memory; FM = Far Memory).
- For each individual population, rearrangements between channels are allowed as long as the resulting population is compliant with the PDG rules for the 82xx/62xx/52xx/42xx platform.
- For each individual population, use the same DDR4 DIMM in all slots.
- For each individual population, sockets are normally symmetric with exceptions for one DCPMM per socket and one DCPMM per node case. Currently, DCPMM modules operate at 2666 MHz.
- Do not mix DCPMM and NVDIMM within the same platform.
- This DCPMM population guide targets a balanced DCPMM-to-DRAM-cache ratio in MM and MM + AD modes.

Installing Memory

ESD Precautions

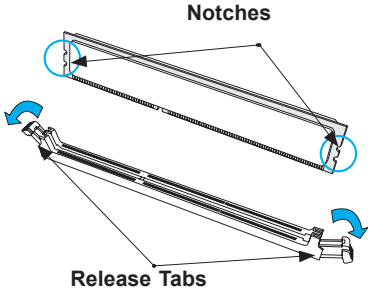
Electrostatic Discharge (ESD) can damage electronic components including memory modules. To avoid damaging DIMM modules, it is important to handle them carefully. The following measures are generally sufficient.

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

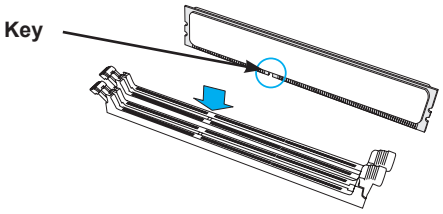
Installing Memory

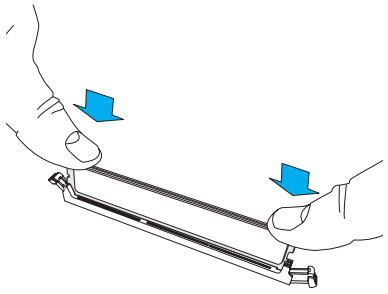
Begin by removing power from the system as described in Section 3.1. Follow the memory population sequence in the table above.

1. Push the release tabs outwards on both ends of the DIMM slot to unlock it.



2. Align the key of the DIMM with the receptive point on the memory slot and with your thumbs on both ends of the module, press it straight down into the slot until the module snaps into place.





3. Press the release tabs to the locked position to secure the DIMM module into the slot.

Caution: Exercise extreme caution when installing or removing memory modules to prevent damage to the DIMMs or slots.

Removing Memory

To remove a DIMM, unlock the release tabs then pull the DIMM from the memory slot.

Motherboard Battery

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

Replacing the Battery

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

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

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

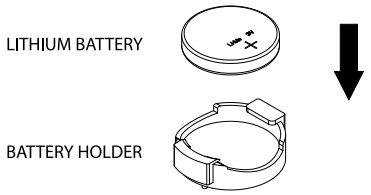


Figure 3-5. Installing the Onboard Battery

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

This section provides instructions on installing and replacing system components. To assure compatibility, only use components that match the specifications or part numbers given.

Storage Drives

The SC219U chassis has six 2.5" hot-swap storage drive bays. These are hybrid bays that support NVMe, SAS, or SATA.

The drives are mounted in drive carriers that simplify their removal from the chassis. These carriers also help promote proper airflow. Even carriers without drives must remain in the chassis for proper airflow.

The server can be purchased with drives installed or without drives installed.

For VROC configurations, refer to the VROC appendix in this manual.

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 https://www.supermicro.com/products/nfo/Ultra.cfm.

Drive Carrier Indicators

Each drive carrier has two LED indicators: an activity indicator and a status indicator. For RAID configurations using a controller, the meaning of the status indicator is described in the table below. For OS RAID or non-RAID configurations, some LED indications are not supported, such as hot spare.

Drive Carrier LED Indicators			
	Color	**Blinking Pattern**	**Behavior for Device**
Activity LED	Blue	Solid On	SAS/NVMe drive installed
	Blue	Blinking	I/O activity
Status LED	Red	Solid On	Failure of drive with RSTe support
	Red	Blinking at 1 Hz	Rebuilding drive with RSTe support
	Red	Blinking with two blinks and one stop at 1 Hz	Hot spare for drive with RSTe support *(not supported in VMD mode)*
	Red	On for five seconds, then off	Power on for drive with RSTe support
	Red	Blinking at 4 Hz	Identify drive with RSTe support
	Green	Solid On	Safe to remove NVMe device *(not supported in VMD mode)*
	Amber	Blinking at 1 Hz	Attention state—do not remove NVMe device *(not supported in VMD mode)*

Removing a Hot-Swap Drive Carrier from the Chassis

1. Press the release button on the drive carrier, which will extend the drive carrier handle.
2. Use the drive carrier handle to pull the drive out of the chassis.

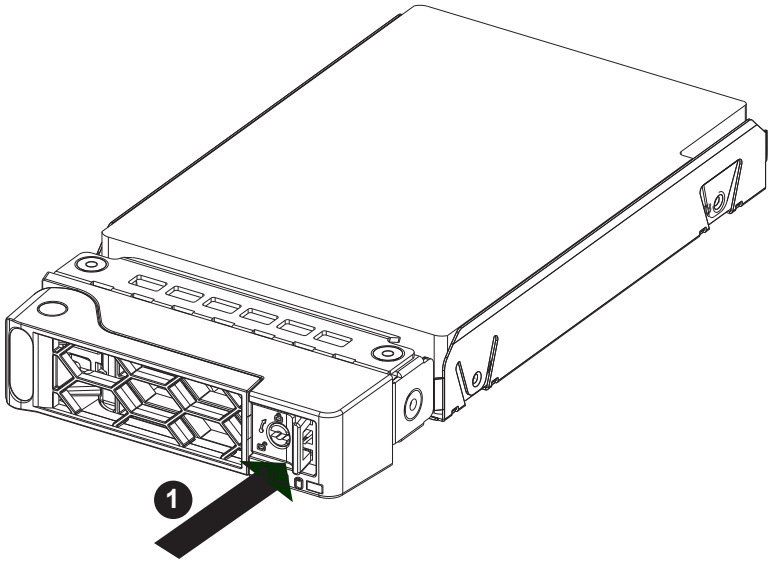


Figure 3-6. Removing a Drive Carrier

Installing a Drive

1. Remove the dummy drive, which comes pre-installed in the drive carrier.

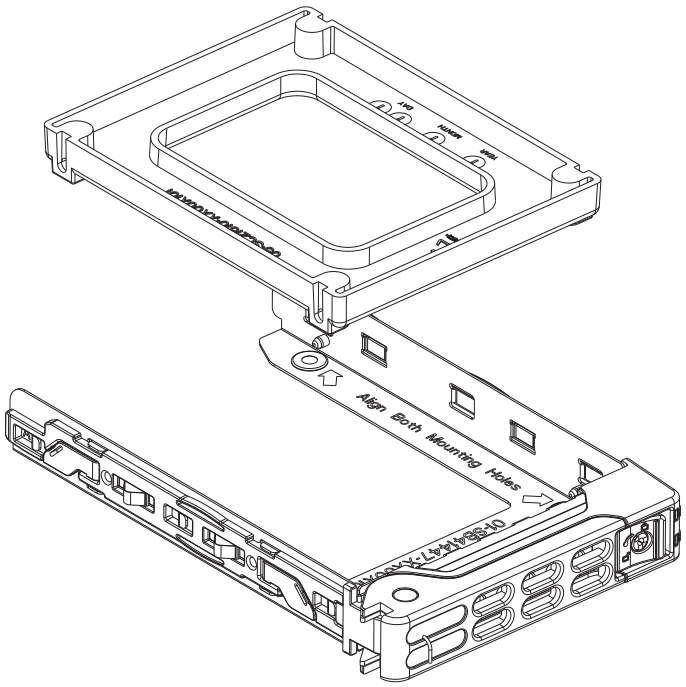


Figure 3-7. Removing the Dummy Drive from a Carrier

2. Insert a drive into the carrier with the PCB side facing down and the connector end toward the rear of the carrier. Align the drive in the carrier so that the carrier pins line up.

3. Insert the drive carrier with the disk drive into its bay, keeping the carrier oriented so that the release button is on the right side. When the carrier reaches the rear of the bay, the release handle will retract.

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

Hot-Swap for NVMe Drives

Supermicro Ultra servers support NVMe surprise hot-swap. For even better data security, NVMe *orderly* hot-swap is recommended. NVMe drives can be ejected and replaced remotely 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 2029U-MTNRV server has one Device and one Group

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

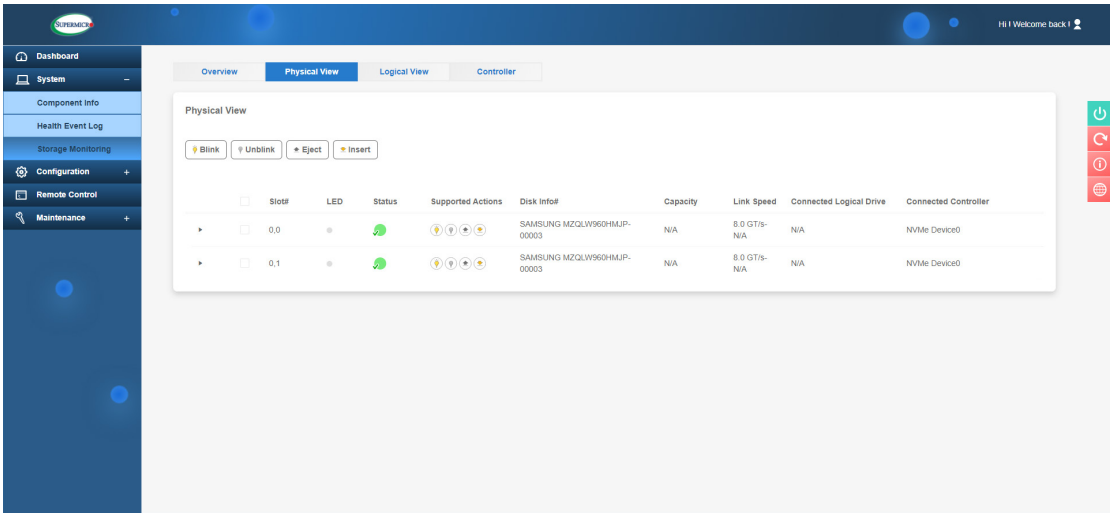


Figure 3-8. IPMI Screenshot

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

Fans

The chassis contains six 6-cm high-performance fans. Fan speed is controlled by IPMI depending on the system temperature. If a fan fails, the remaining fans will ramp up to full speed. The system will continue to run with a failed fan, although it may shut down if the heat gets too great. Replace any failed fan at your earliest convenience with the same model. Failed fans can be identified through the IPMI.

Changing a System Fan

1. Using the handle, pull the drawer with the failed fan from the chassis.
2. Push the replacement fan assembly drawer firmly into the housing.
3. Check that the fan is working properly and that the alert LED on the control panel turns off.

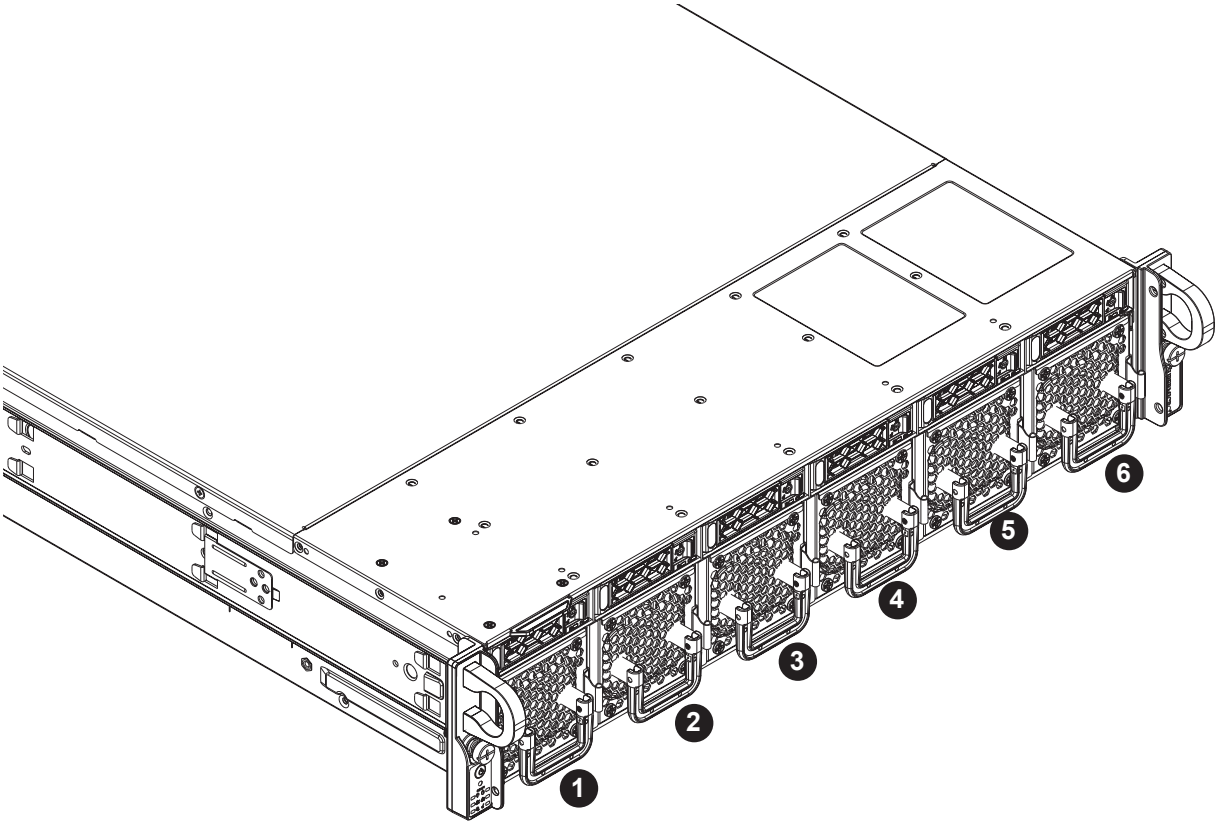


Figure 3-9. Fan Positions and Numbering

Installing the Air Shrouds

Air shrouds concentrate airflow to maximize fan efficiency. They do not require screws to install. Some GPUs require specialized shrouds (see Appendix F).

Installing the Standard Air Shrouds

- Position the air shrouds as illustrated in the figure below.

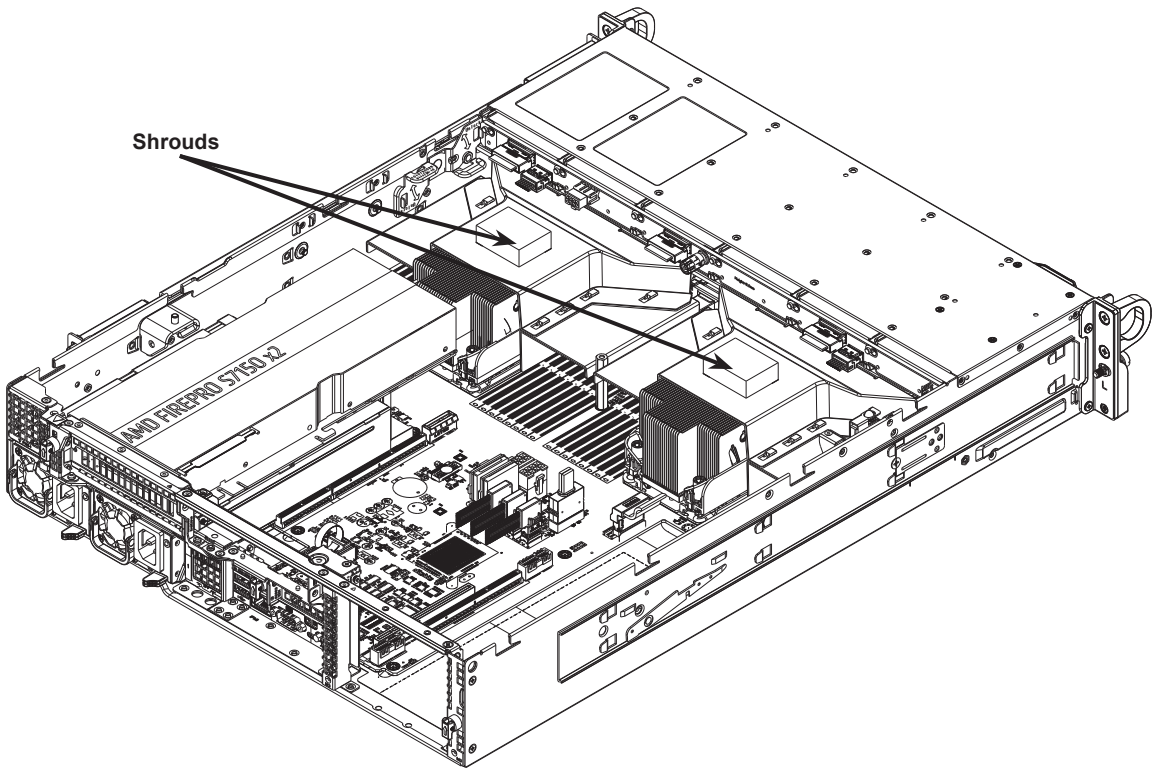


Figure 3-10. Installing the Standard Air Shrouds

Power Supply

The system features redundant power supplies and will continue to operate if one module fails. It should be replaced as soon as convenient. They can be changed without powering down the system. New units can be ordered directly from Supermicro or authorized distributors.

These power supplies are auto-switching capable. This feature enables them to automatically sense the input voltage and operate at a 100-120v or 180-240v.

Power Supply LEDs

On the rear of the power supply module, an LED displays the status.

- **Solid Green**: When illuminated, indicates that the power supply is on.
- **Blinking Green**: When blinking, indicates that the power supply is plugged in and turned off by the system.
- **Blinking Amber:** When blinking, indicates that the power supply has a warning condition and continues to operate.
- **Solid Amber**: When illuminated, indicates that the power supply is plugged in, and is in an abnormal state. The system might need service. Please contact Supermicro technical support.

Changing the Power Supply Module:

1. Unplug the AC cord from the module to be replaced.
2. On the back of the module, push the release tab sideways.
3. Pull the module out using the handle.

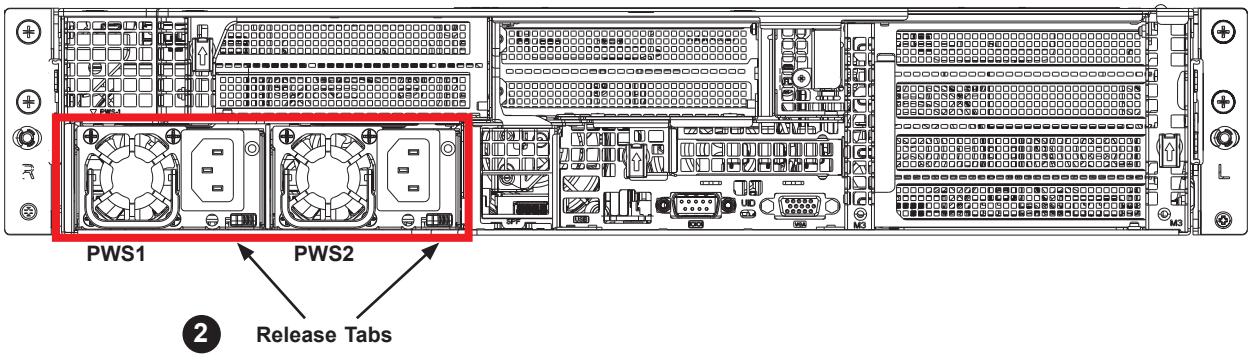


Figure 3-11. Power Supply Release Tabs

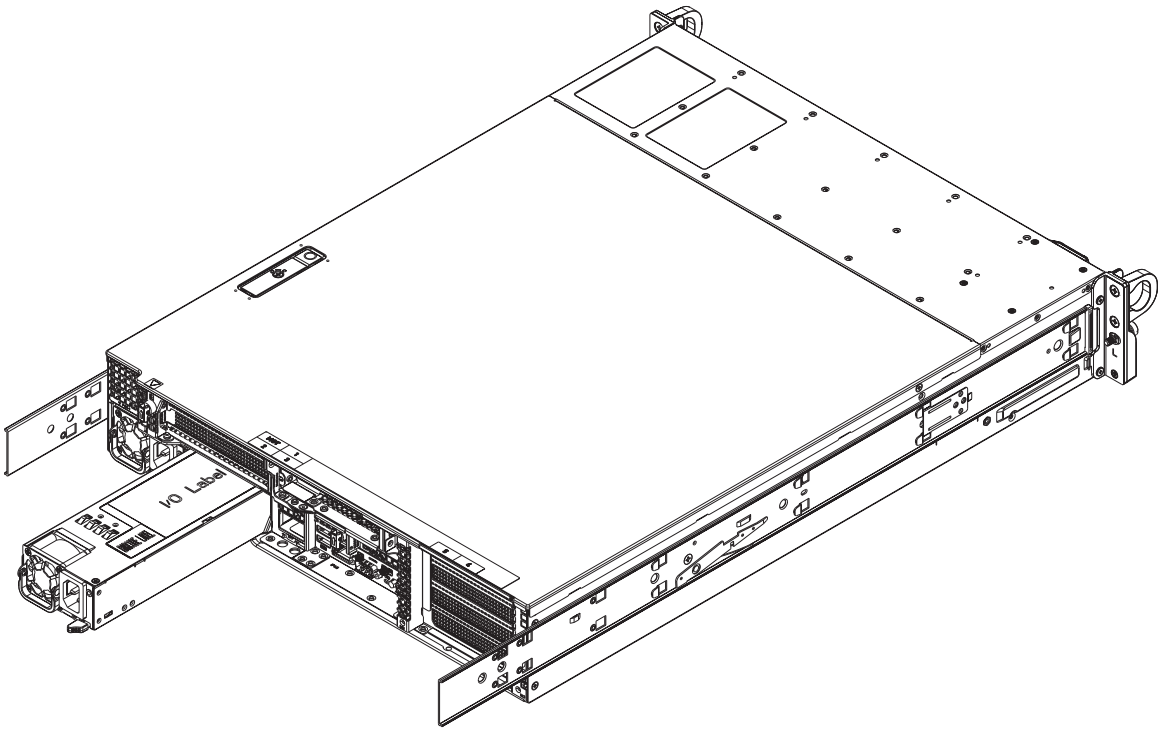


Figure 3-12. Replacing the Power Supply

4. Push the new power supply module into the power bay until it clicks. Replace with the same model.
5. Plug the AC power cord back into the module.

PCI Expansion Cards

Riser cards on chassis brackets allow you to add PCI expansion cards. All expansion cards are PCI Express 3.0.

- RSC-R2UW-4E8 supports four standard size PCIe x8 expansion cards (5-8).
- RSC-R1UW-E8R supports one low-profile x8 expansion card (4)

Additional expansion card capability depends on which Ultra riser card is installed in your model (see the table below). For details on installing GPUs, see Appendix F.

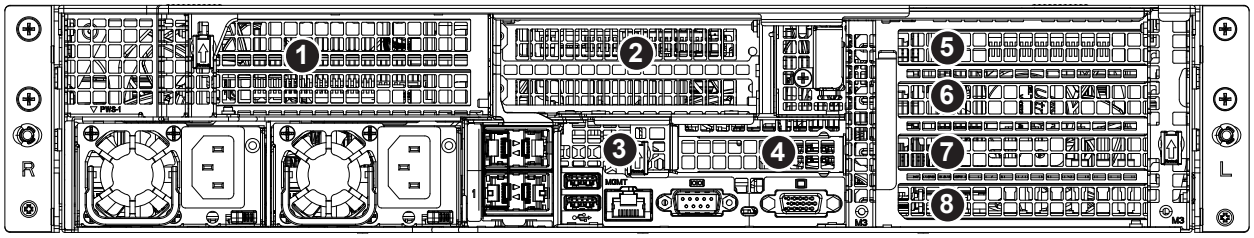


Figure 3-13. PCI Expansion Card Chassis Slots

Expansion Card Configurations		
Slot	**Form Factor**	**Lanes**
1	Double-width, full-height, full-length	x16 (CPU1)
2	Double-width, full-height, full-length	x16 or x8 (CPU1)
3*	Internal low-profile, half-length	x8 (CPU1)
4	Low-profile, half-length	x8 (CPU2)
5	Full-height, full-length	x8 (CPU2)
6	Full-height, full-length	x8 (CPU2)
7	Full-height, full-length	x8 (CPU2)
8	Full-height, full-length	x8 (CPU2)

Full-height = 4.2", Low-profile = 2.5" Full-length = 10.5", Half-length = 6.6"

Ultra Riser Card Options			
Riser Card	**Slot 1**	**Slot 2**	**Slot 3***
AOC-2UR68-i2XT	x16	x8 (in x16 slot)	internal x8
AOC-2UR68-i2XS			
AOC-2UR68-m2TS			
AOC-2UR68-i4G			na

* This slot supports Supermicro SAS Cards listed below. Optional re-timer AOC-SLG3-2E4R can be installed to support NVMe drive in drive slot 2-3.

Supermicro SAS Cards	
Part Number	**Description**
AOC-S3008L-L8e (8-port HBA)	Std LP, 8 internal ports, 12 Gb/s per port, Gen 3, 122HDD, HBA
AOC-S3008L-L8i (8-port SW RAID)	Std LP, 8 internal ports, 12 Gb/s per port, Gen 3, 63HDD, RAID 0, 1, 1E
AOC-S3108L-H8iR (8-port HW RAID)	Std LP, 8 internal ports, 12 Gb/s per port, Gen 3, 240HDD, RAID 0, 1, 5, 6, 10, 50, 60
AOC-S3108L-H8iR-16DD (8-port HW RAID)	Std LP, 8 internal ports, 12 Gb/s per port, Gen 3, 16HDD, RAID 0, 1, 5, 6, 10, 50, 60

Installing Full Height Expansion Cards

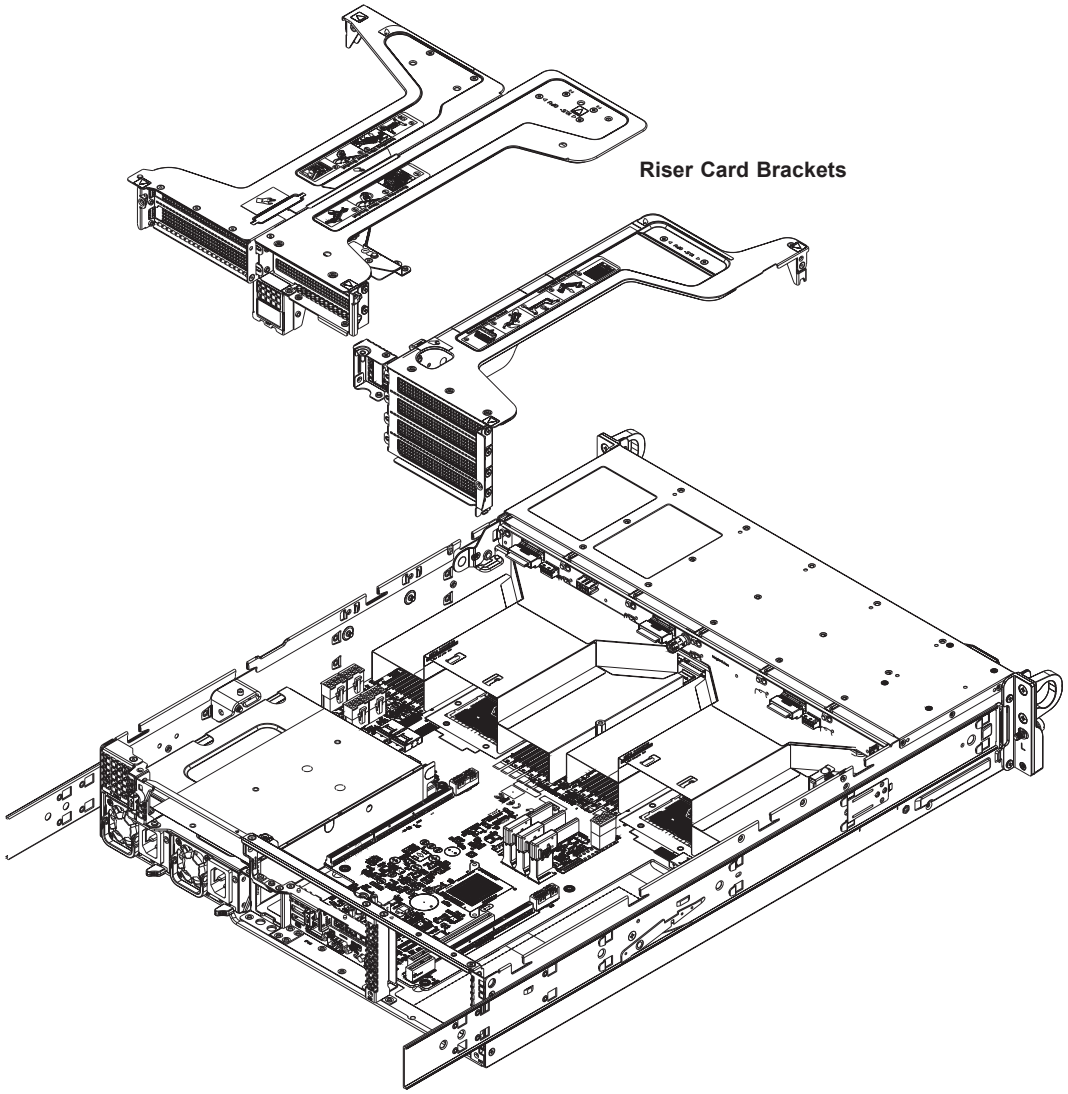


Figure 3-14. Installing Expansion Cards

Installing PCI Expansion Cards

1. Power down the system and remove the top chassis cover.
2. Remove the riser card bracket, pictured above. On the rear of the chassis, each bracket is secured by a small black plastic flip-lever with an arrow on it. Flip open the appropriate lever to release the bracket, then pull the bracket out of the chassis.
3. Insert the expansion card(s) into the riser card slot(s) while aligning the rear PCI shield.
4. Replace the riser card into the motherboard expansion slot while aligning the bracket into the chassis. Flip the black plastic lever back in place, making sure it snaps closed with a click.
5. Replace the chassis cover.

Installing the Low Profile Center Expansion Card

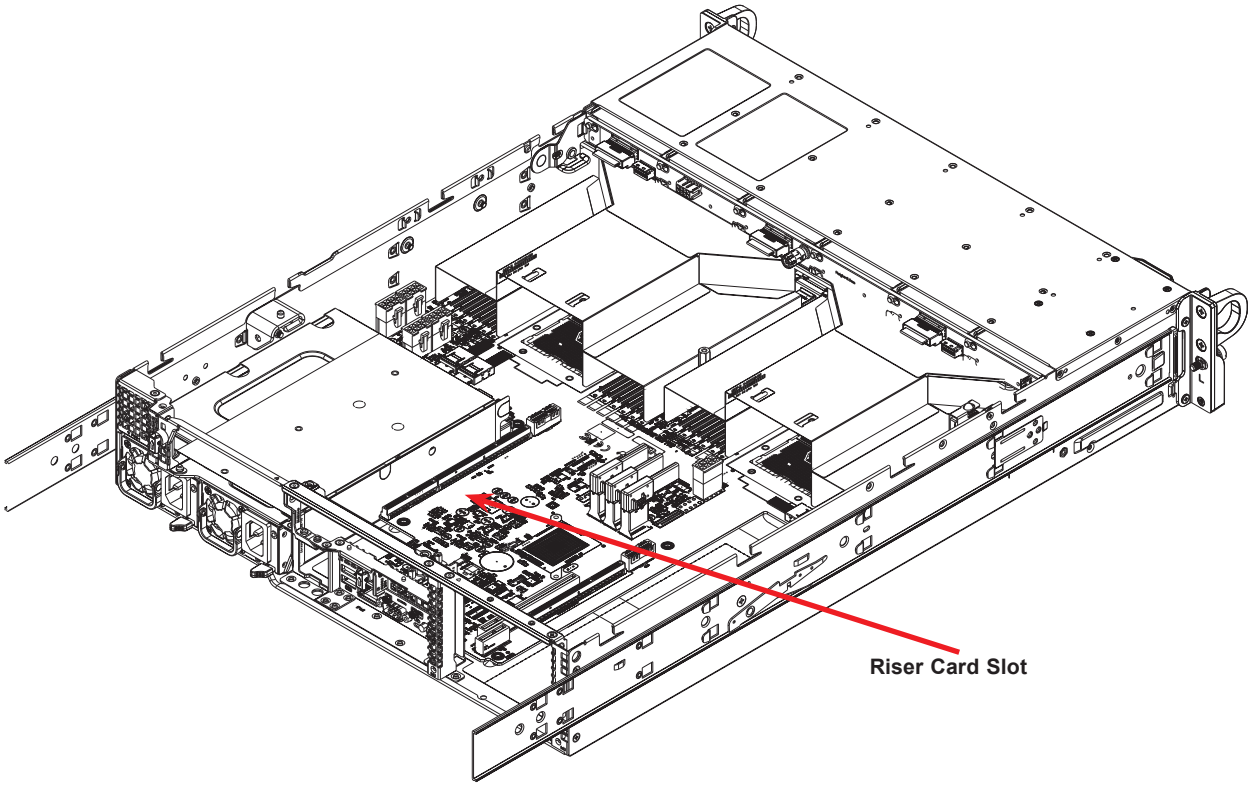


Figure 3-15. Installing Low Profile Expansion Card

Installing the Low Profile PCI Expansion Card (❹)

1. Power down the system and remove the top chassis cover.
2. If necessary, remove the full height expansion card to access the low profile riser card slot, pictured above.
3. Insert the expansion card into the riser card slot while aligning the rear PCI shield into the chassis. Add the screw to secure the PCI shield.
4. Replace the full height expansion card above the low profile card if necessary, then replace the chassis cover.

Installing the Internal Expansion Card

For most models, the Ultra riser card that holds the LAN ports also offers another internal low profile card slot (❸). Installation is pictured below.

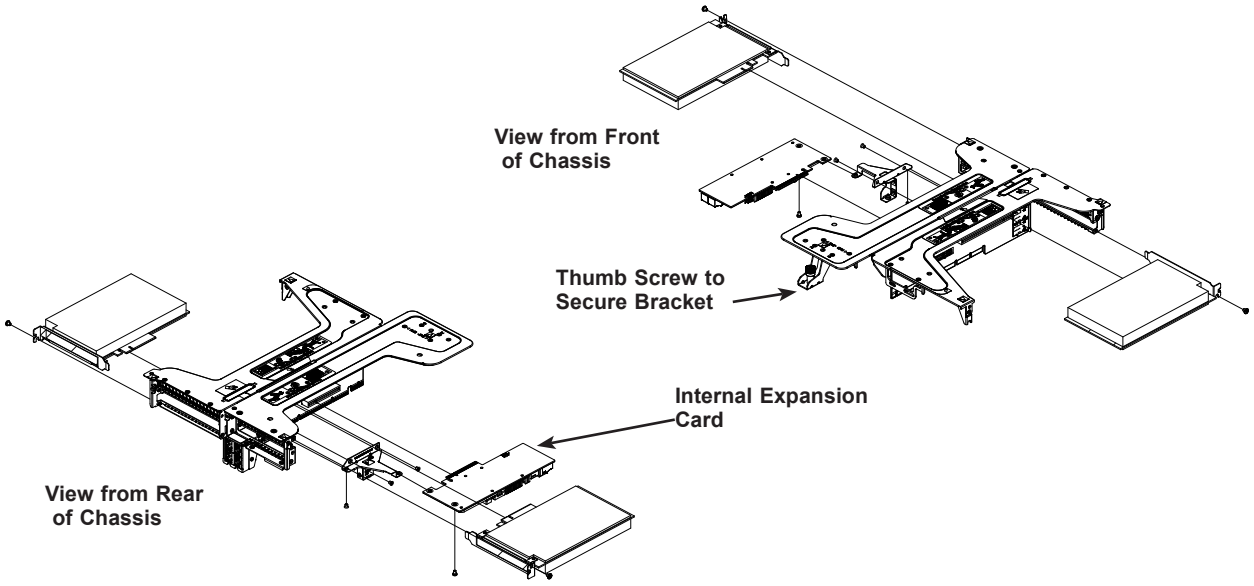


Figure 3-16. Ultra Riser Bracket and Expansion Cards

See previous procedures for details to access the riser card and bracket.

Ultra Riser and Expansion Cards with Optional Storage Drives

This server supports an option to add two storage drives in place of expansion cards.

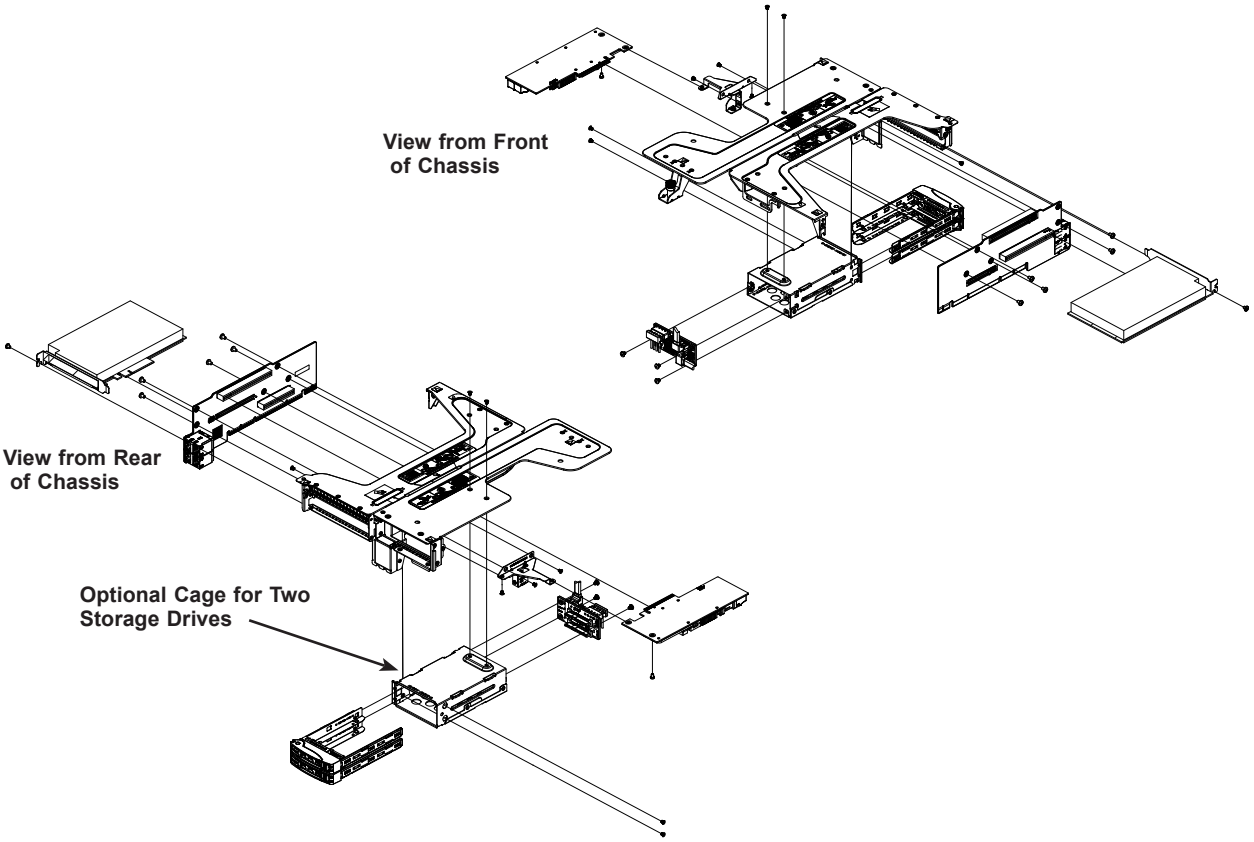


Figure 3-17. Ultra Riser and Expansion Cards with Optional Storage Drives

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

Two power connections supply the motherboard and several more supply for onboard devices.

Main Power Connector

Two proprietary main power headers are located at PSU1 and PSU2. Connect appropriate power supply units to these two headers to provide adequate power to your system.

Important: To provide adequate power to the motherboard, connect the both main power connectors to the power supply. Failure to do so may void the manufacturer's warranty on your power supply and motherboard.

Backplane Power Connectors & GPU Power Connectors

In addition to the main power headers, eight 8-pin power connectors are also located on the motherboard to supply power to onboard devices. GPU Power Connectors 1-4 are used for GPU devices, while BP PWR 1-4 are used for backplane devices. Connect these connectors to your power supply to provide adequate power to your onboard devices.

8-pin GPU Power Pin Definitions

Pin#	Definition
1 - 4	Ground
5 - 8	+12 V

8-pin Backplane Power Pin Definitions

Pin#	Definition
1 - 4	Ground
5 - 6	+12V
7 - 8	+5V

4.2 Headers and Connectors

Fan Headers

There are eight fan headers on the motherboard. These are 4-pin fan headers, although pins 1-3 are backward compatible with traditional 3-pin fans. Four-pin fans allow fan speeds to be controlled by Thermal Management in IPMI. When using the Thermal Management setting, 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

T-SGPIO3 Header

A Serial General Purpose Input/Output header (T-SGPIO3) is located next to the TPM/Port 80 on the motherboard. This 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

Disk-On-Module Power Connector

The Disk-On-Module (DOM) power connectors at JSD1 and JSD2 provide 5V power to a solid-state DOM storage devices connected to one of the SATA ports.

DOM Power Pin Definitions

Pin#	Definition
1	5V
2	Ground
3	Ground

TPM Header

The JTPM1 header is used to connect a Trusted Platform Module (TPM)/Port 80, which is available from Supermicro. 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 storage drive is not installed in the system.

Trusted Platform Module/Port 80 Header Pin Definitions

Pin#	Definition	Pin#	Definition
1	P3V3	2	SPI_TPM_CS_N
3	PCIe_RESET_N#	4	SPI_PCH_MISO
5	SPI_PCH_CLK#	6	Ground
7	SPI_PCH_MOSI	8	N/A
9	JTPM1_P3V3A	10	IRQ_TPM_SPIN_N

Internal Speaker/Buzzer

The Internal Speaker/Buzzer (SP1) is used to provide audible indications for various beep codes.

Internal Buzzer Pin Definitions

Pin#	Definition	
1	Pos (+)	Beep In
2	Neg (-)	Alarm Speaker

4-pin BMC External I²C Header

A System Management Bus header for IPMI 2.0 is located at JIPMB1. Connect a cable to this header to use the IPMB I²C connection on your system..

External I²C Header Pin Definitions

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

Chassis Intrusion

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

Chassis Intrusion Pin Definitions

Pins	Definition
1	Intrusion Input
2	Ground

RAID Key Header

A RAID Key header is located at JRK1 on the motherboard. It supports VMD used in creating optional advanced NVMe RAID configurations.

RAID Key Header Pin Definitions	
Pin#	**Definition**
1	Ground
2	RAID_KEY_PU
3	Ground
4	PCH_RAID_KEY

Front VGA Port

One VGA port is located at JVGA2 on the motherboard. This VGA port provides front accessible video display.

Micro SD Card Slot

JSDCARD1: Micro SSD card slot (reserved for manufacture use only).

NVMe SMBus Headers

NVMe SMBus (I^2C) headers (JNVI^{2}C1/2), used for PCIe SMBus clock and data connections, provide hot-plug support thruough a dedicated SMBus interface. This feature is only available for a Supermicro complete system with a proprietary NVMe add-on card and cable installed.

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

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.

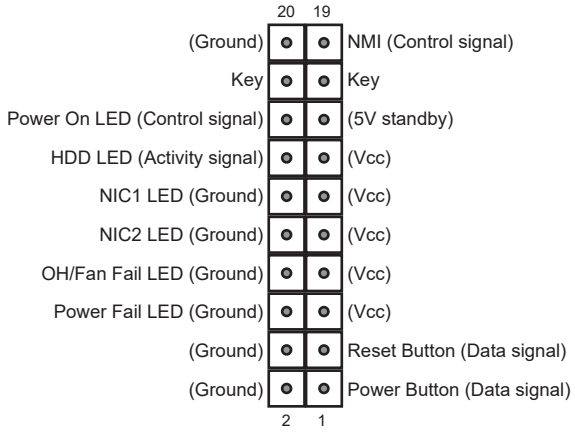


Figure 4-1. JF1 Control Panel Pins

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 6). To turn off the power when the system is in suspend mode, press the button for 4 seconds or longer.

Power Button Pin Definitions (JF1)	
Pin#	**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.

Reset Button Pin Definitions (JF1)	
Pin#	**Definition**
3	Reset
4	Ground

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1.

Power Fail LED Pin Definitions (JF1)	
Pin#	Definition
5	3.3V
6	PWR Supply Fail

Overheat (OH)/Fan Fail

Connect an LED cable to pins 7 and 8 of JF1 to use the Overheat/Fan Fail LED connections. The LED on pin 8 provides warnings of overheat or fan failure.

OH/Fan Fail Indicator Status	
Status	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 the NIC LED cables here to display network activity.

LAN1/LAN2 LED Pin Definitions (JF1)	
Pin#	Definition
9	NIC2 Activity LED
10	NIC2 Link LED
11	NIC1 Activity LED
12	NIC1 Link LED

HDD LED/UID Switch

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

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	3.3V Standby/UID Switch
14	HDD Active

Power LED

The Power LED connection is located on pins 15 and 16 of JF1.

Power LED Pin Definitions (JF1)	
Pin#	**Definition**
15	3.3V
16	Power LED

NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1.

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

4.3 Input/Output Ports

Rear I/O Ports

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

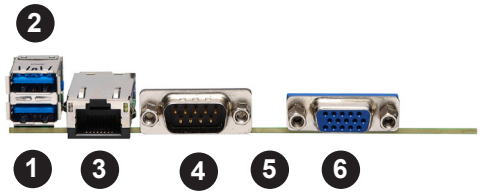


Figure 4-2. Rear I/O Ports

Rear I/O Ports	
#	**Description**
1.	USB 0 (3.0)
2.	USB 1 (3.0)
3.	IPMI Dedicated LAN
4.	COM Port 1
5.	UID switch/LED (not pictured)
6.	VGA

LAN Ports

There are two or four LAN ports on the chassis rear provided by the Ultra add-on card, depending on the model. There is also a dedicated IPMI LAN port on the I/O back panel. For more information on IPMI, refer to the IPMI User's Guide posted on our website at http://www.supermicro.com.

Unit Identifier Switch/UID LED Indicator

A Unit Identifier (UID) switch and a UID LED indicator are located on the rear of the system. When you press the UID switch, both front and rear UID LED indicators are toggled on or off. The UID indicators provide easy identification of a system in a rack.

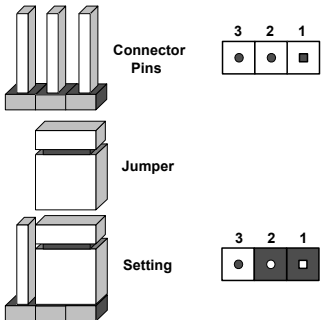
Note: UID can also be triggered using IPMI.

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.



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

I^2C Bus for VRM

Jumpers JVRM1 and JVRM2 allow 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

4.5 LED Indicators

LAN LEDs

The Ethernet ports each have two LEDs. One LED indicates activity when flashing, while the other LED may be green, amber or off to indicate the speed of the connection.

LAN LED (Connection Speed Indicator)	
LED Color	**Definition**
Off	10 Mb/s
Green	100 Mb/s
Amber	1 Gb/s

Dedicated IPMI LAN LEDs

A dedicated IPMI LAN port is also included on the motherboard. The amber LED on the right of the IPMI LAN port indicates activity, while the green LED on the left indicates the speed of the connection.

IPMI LAN LED	
Color	**Definition**
Off	No Connection
Green	100 Mb/s

Unit ID LED

A rear unit identifier (UID) indicator at LED1 is located near the UID switch on the I/O back panel. It provides easy identification of a unit that may need service.

Onboard Power LED

LEDPWR is an Onboard Power LED. When this LED is lit, it means power is present on the motherboard. In suspend mode this LED will blink on and off.

BMC Heartbeat LED

LEDM1 is the BMC heartbeat LED. When the LED is blinking green, BMC is functioning normally.

Memory Fault Indication LEDs

The memory fault LEDs provide visual notification to a service technician which memory DIMM slot(s) are at fault due to un-correctable memory errors during POST (Power-On Self-Test). A memory fault LED will remain "on" even after system reboots (or repeated "power cycling") until it is reset manually by the technician using the BIOS setup menu to turn it off. This feature allows the technician to easily identify and replace any bad DIMMs that may be at fault in the system.

Memory Fault LED Indicators		
LED	**Description**	**Status**
LED_P1_A1-A2	Memory Fault LEDs for Memory Module P1_A1-A2	Red: on (memory errors)
LED_P1_B1-B2	Memory Fault LEDs for Memory Module P1_B1-B2	Red: on (memory errors)
LED_P1_C1-C2	Memory Fault LEDs for Memory Module P1_C1-C2	Red: on (memory errors)
LED_P1_D1-D2	Memory Fault LEDs for Memory Module P1_D1-D2	Red: on (memory errors)
LED_P1_E1-E2	Memory Fault LEDs for Memory Module P1_E1-E2	Red: on (memory errors)
LED_P1_F1-F2	Memory Fault LEDs for Memory Module P1_F1-F2	Red: on (memory errors)
LED_P2_A1-A2	Memory Fault LEDs for Memory Module P2_A1-A2	Red: on (memory errors)
LED_P2_B1-B2	Memory Fault LEDs for Memory Module P2_B1-B2	Red: on (memory errors)
LED_P2_C1-C2	Memory Fault LEDs for Memory Module P2_C1-C2	Red: on (memory errors)
LED_P2_D1-D2	Memory Fault LEDs for Memory Module P2_D1-D2	Red: on (memory errors)
LED_P2_E1-E2	Memory Fault LEDs for Memory Module P2_E1-E2	Red: on (memory errors)
LED_P2_F1-F2	Memory Fault LEDs for Memory Module P2_F1-F2	Red: on (memory errors)

4.6 Storage Ports

I-SATA 3.0 and S-SATA 3.0 Ports

The X11DPU has eight I-SATA 3.0 ports (I-SATA0-3, I-SATA4-7) which are supported by the Intel C621 chipset. In addition, it also has six S-SATA 3.0 ports (S-SATA0-3, S-SATA4/S-SATA5) that are supported by the Intel SCU. S-SATA4/5 can be used with Supermicro SuperDOMs which are yellow SATA DOM connectors with power pins built in, and do not require external power cables. Supermicro SuperDOMs are backward-compatible with regular SATA HDDs or SATA DOMs that need external power cables.

NVM Express Connections

Four NVM Express ports are located on the motherboard. These NVMe ports provide PCIe 3.0 x4 connections. P1_NVME0/1 are supported by CPU1. P2_NVME0/1 are supported by CPU2. The NVMe ports provide high-speed low-latency connections directly from the CPU to NVMe Solid State drives (SSDs). This greatly increases SSD data-throughput performance and significantly reduces PCIe latency by simplifying driver/software requirements resulting from direct PCIe interface from the CPU to the NVMe SSD drives.

Chapter 5

Software

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

5.1 Microsoft Windows OS Installation

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

Installing the OS

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

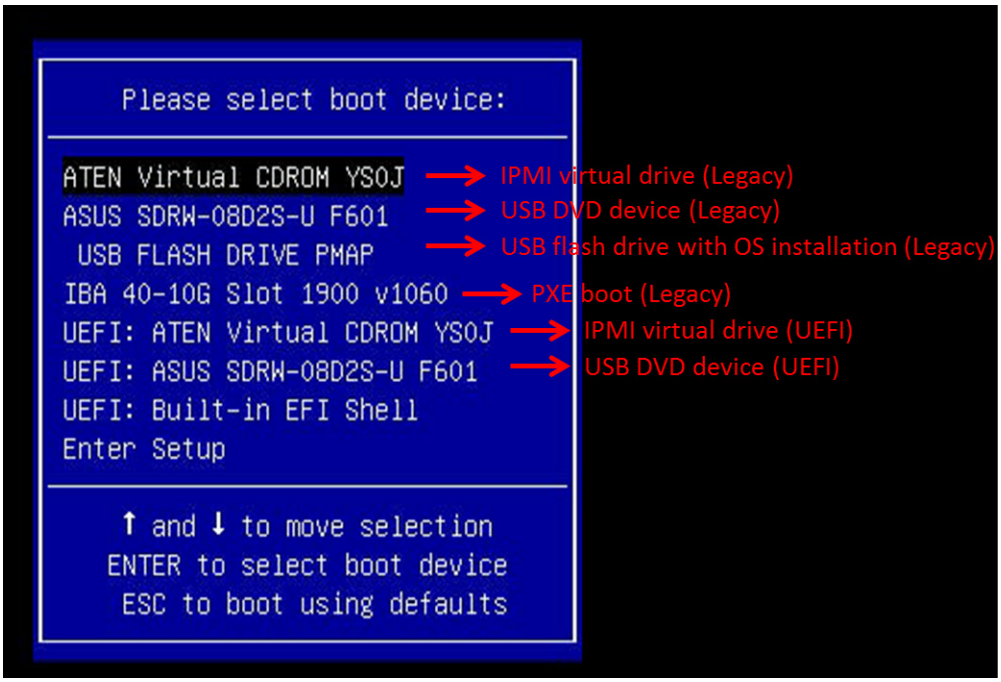


Figure 5-1. Select Boot Device

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

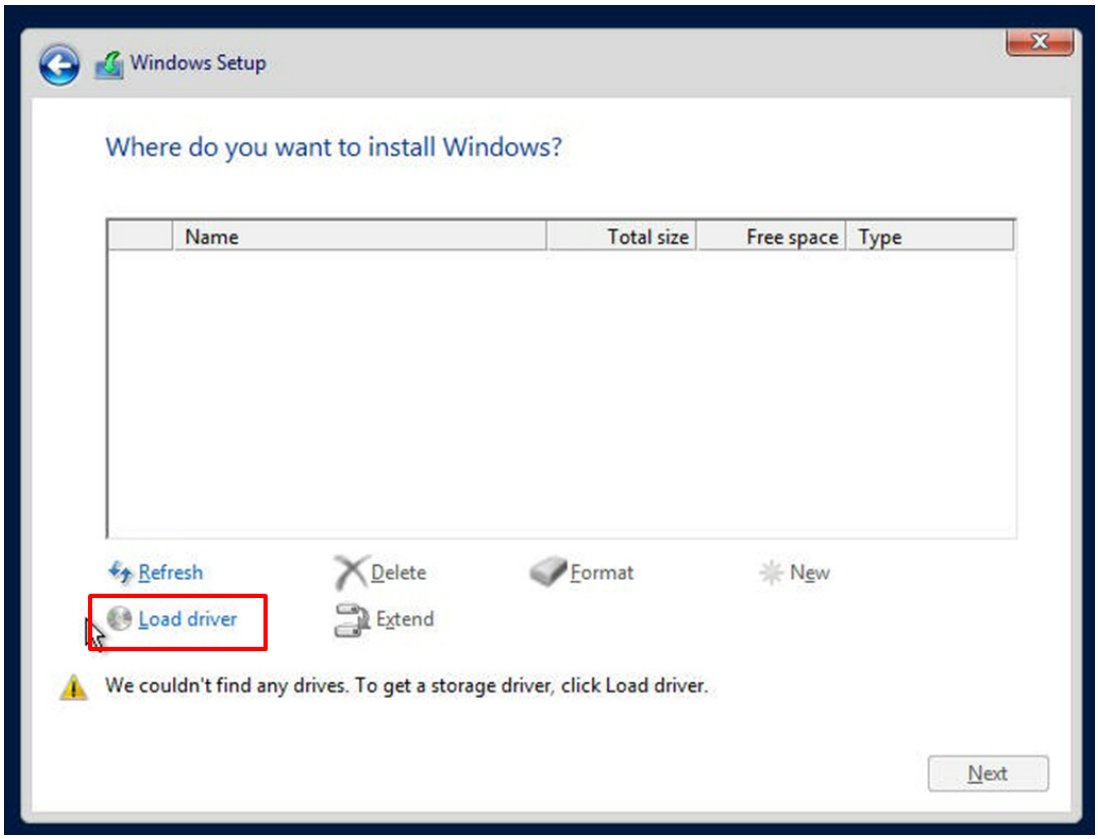


Figure 5-2. Load Driver Link

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

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

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

5.2 Driver Installation

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

After accessing the website, go into the CDR_Images (in the parent directory of the above link) and locate the ISO file for your motherboard. Download this file to a USB flash or mdia 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.

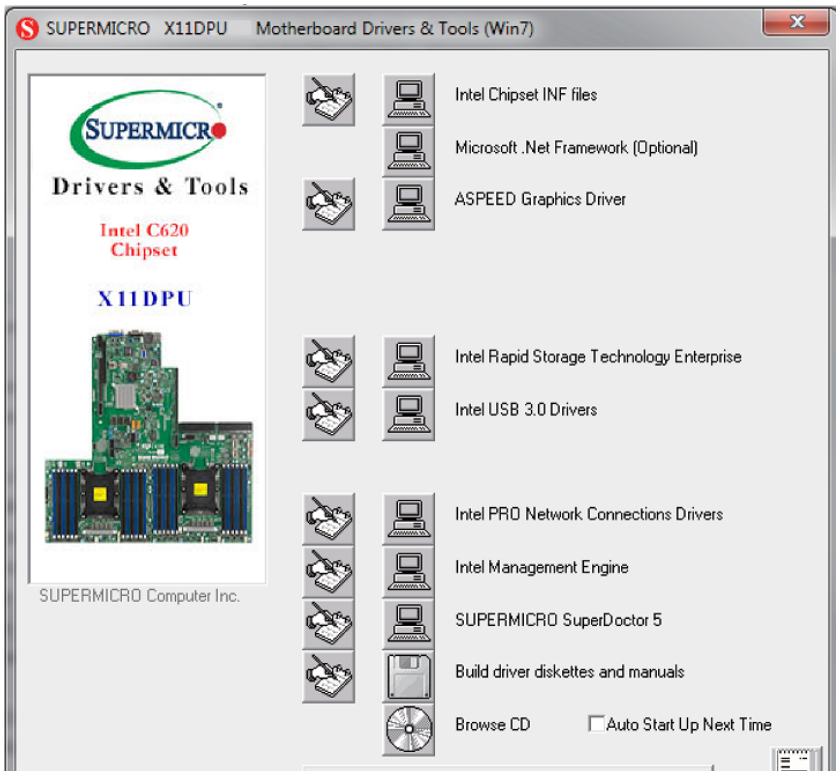


Figure 5-3. Driver & Tool Installation Screen

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.

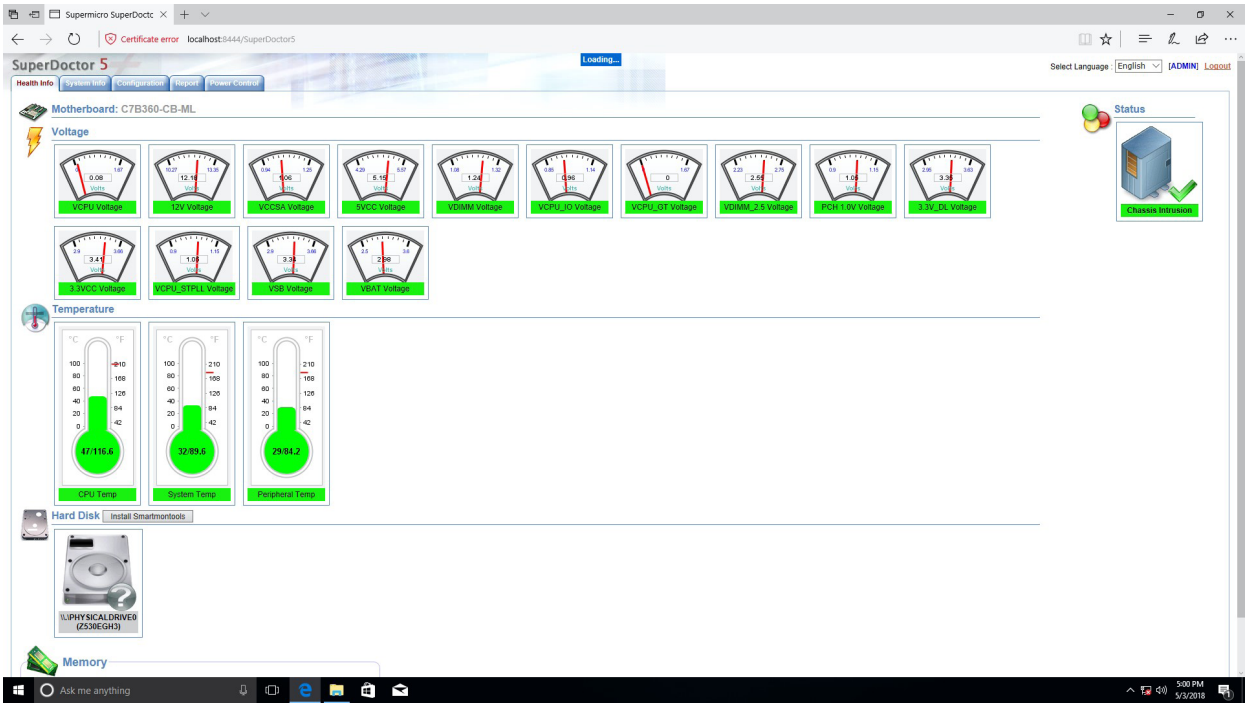


Figure 5-4. SuperDoctor 5 Interface Display Screen (Health Information)

5.4 BMC

The motherboard provides remote access, monitoring and management through the baseboard management controller (BMC) and other management controllers distributed among different system modules. There are several BIOS settings that are related to BMC. For general documentation and information on BMC, visit our website at:

www.supermicro.com/en/solutions/management-software/bmc-resources

BMC ADMIN User Password

For security, each system is assigned a unique default BMC password for the ADMIN user. This can be found on a sticker on the chassis and a sticker on the motherboard. The sticker also displays the BMC MAC address. If necessary, the password can be reset using the Supermicro IPMICFG tool.



Figure 5-5. BMC Password Label

See Chapter 1 for the locations of the labels.

Chapter 6

UEFI BIOS

6.1 Introduction

This chapter describes the AMI UEFI BIOS setup utility for the X11DPU and provides the instructions on navigating the setup screens. The BIOS is stored in a Flash EEPROM and can be updated.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted since this manual was published.

Starting BIOS Setup Utility

To enter the BIOS setup utility screens, press the <Delete> key while the system is booting up. (There are a few cases when other keys are used, such as <F1>, <F2>, etc.)

The BIOS screens have three main frames. The large left frame displays options can be configured by the user. These are blue. When an option is selected, it is highlighted in white. Settings printed in **Bold** are the default values.

In the left frame, a " ▶" indicates a submenu. Highlighting such an item and pressing the <Enter> key opens the list of settings in that submenu.

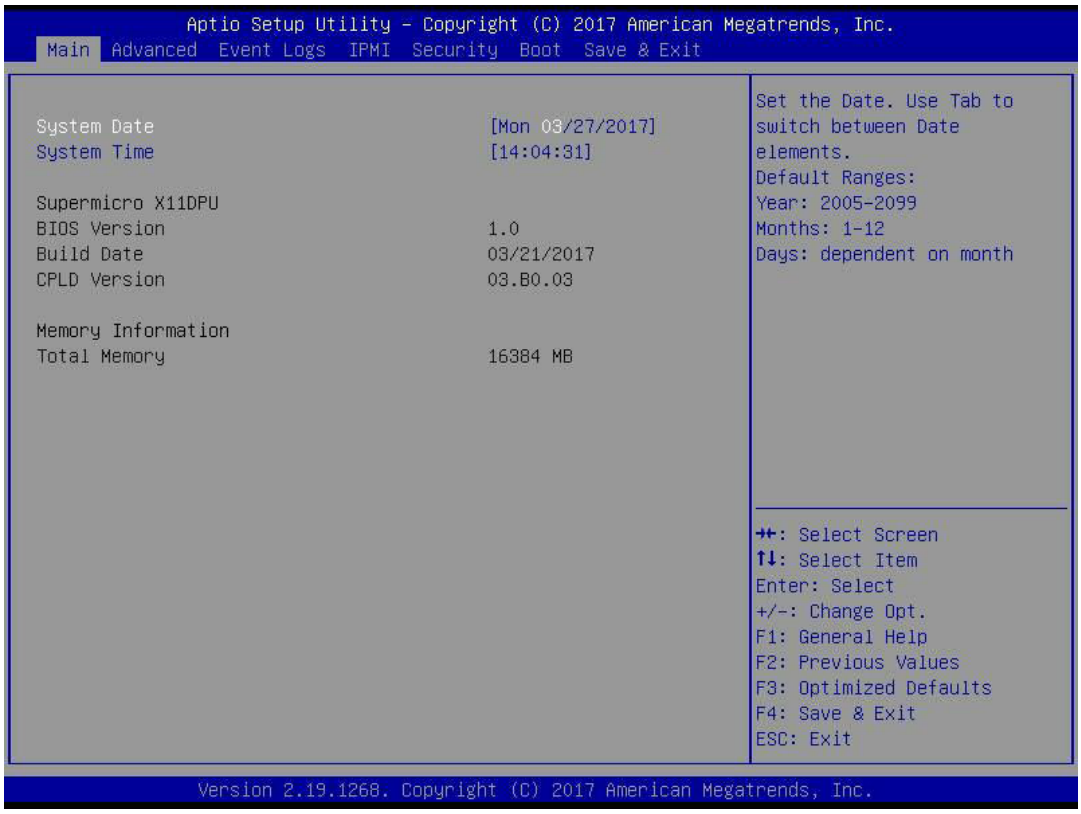
The upper right frame displays helpful information for the user. The AMI BIOS has default informational messages built in. The manufacturer retains the option to include, omit, or change any of these informational messages.

The lower right frame lists navigational methods. The AMI BIOS setup utility uses a key-based navigation system called *hot keys*. Most of these hot keys can be used at any time during setup navigation. These keys include <F3>, <F4>, <Enter>, <ESC>, arrow keys, etc.

Some system parameters may be changed.

6.2 Main Setup

When running the BIOS setup utility, it starts with the Main screen. You can always return to it by selecting the Main tab on the top of the screen.



The Main tab page allows you to set the date and time, and it displays system information.

System Date/System Time

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

Note: The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00. The date's default value is 01/01/2016 after RTC reset.

Supermicro X11DPU (Motherboard model)

BIOS Version

Build Date (of the BIOS)

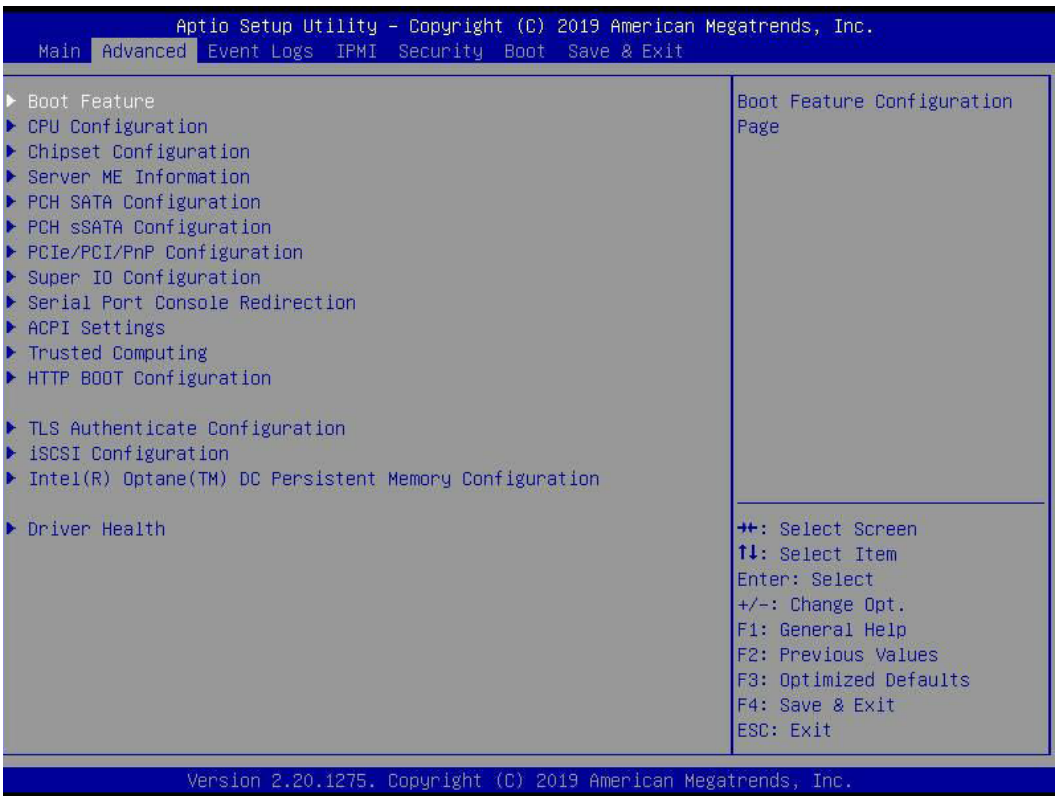
CPLD (Complex Programmable Logic Device) Version: This item displays the CPLD version used in the system.

Memory Information

Total Memory (for the system)

6.3 Advanced Setup Configurations

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



Caution: Take caution when changing the Advanced settings. An incorrect value, a very high DRAM frequency, or an incorrect DRAM timing setting may make the system unstable. If this occurs, revert to the manufacture default settings.

▸Boot Feature

Quiet Boot

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

Option ROM Messages

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

Bootup NumLock State

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

Wait For "F1" If Error

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

INT19 (Interrupt 19) Trap Response

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Immediate, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at bootup immediately and allow the drives that are attached to 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 and allow the drives attached to these adaptors to function as bootable devices at bootup. The options are **Immediate** and Postponed.

Re-try Boot

If this item is enabled, the BIOS will automatically reboot the system from a specified boot device after its initial boot failure. The options are **Disabled**, Legacy Boot, and EFI Boot.

Install Windows 7 USB support

Enable this feature to use the USB keyboard and mouse during the Windows 7 installation, since the native XHCI driver support is unavailable. Use a SATA optical drive as a USB drive. USB CD/DVD drives are not supported. Disable this feature after the XHCI driver has been installed in Windows. The options are **Disabled** and Enabled.

Port 61h Bit-4 Emulation

Select Enabled to support the emulation of Port 61h bit-4 toggling in SMM (System Management Mode). The options are **Disabled** and Enabled.

Power Configuration

Watch Dog Function

If enabled, the Watch Dog Timer will allow the system to reset or generate NMI based on jumper settings when it is expired for more than 5 minutes. The options are **Disabled** and Enabled.

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Stay-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 **Instant Off** and 4 Seconds Override.

Throttle on Power Fail

Throttling improves reliability and reduces power consumption in the processor via automatic voltage control during processor idle states. Select Enabled to decrease the system power by throttling CPU frequency when one power supply is failed. The options are **Disabled** and Enabled.

▶CPU Configuration

This submenu displays the information of the CPU as detected by the BIOS. It also allows the user to configuration CPU settings:

- Processor BSP Revision
- Processor Socket
- Processor ID
- Processor Frequency
- Processor Max Ration
- Processor Min Ration
- Microcode Revision
- L1 Cache RAM
- L2 Cache RAM
- L3 Cache RAM
- Processor 0 Version
- Processor 1 Version

Hyper-Threading [All] (Available when supported by the CPU)

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

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

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

Intel Virtualization Technology (Available when supported by the CPU)

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

> **Note:** If a change is made to this setting, you will need to reboot the system for the change to take effect. Refer to Intel's website for detailed information.

PPIN Control

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

Hardware Prefetcher (Available when supported by the CPU)

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

Adjacent Cache Prefetch (Available when supported by the CPU)

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

DCU Streamer Prefetcher (Available when supported by the CPU)

Select Enabled to enable Intel CPU Advanced Encryption Standard (AES) Instructions for CPU to enhance data integrity. The options are **Enable** and Disable.

DCU IP Prefetcher (Available when supported by the CPU)

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

LLC Prefetch

Select Enable to support the LLC prefetch on all threads. The options are **Disable** and Enable.

Extended APIC

Select Enable to use the extended APIC (Advanced Programmable Interrupt Control) support to enhance power management. 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 Disable and **Enable**.

▶Advanced Power Management Configuration

▶CPU P State Control

SpeedStep (Pstates)

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

EIST PSD Function

This feature allows the user to change the P-State (Power-Performance State) coordination type. P-State is also known as "SpeedStep" for Intel® processors. Select HW_ALL to change the P-State coordination type for all hardware components only. Select SW_ALL to change the P-State coordination type for all software installed in the system. Select SW_ANY to change the P-State coordination type for a particular software program specified by the user in the system. The options are **HW_ALL**, SW_ALL, and SW_ANY.

Turbo Mode (Available when Intel® EIST Technology is enabled)

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

▶Hardware PM State Control

Hardware P-States

This feature enables the hardware P-States support. 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

Use this feature to enable the autonomous core C-State control. The options are **Disable** and Enable.

CPU C6 report

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

Enhanced Halt State (C1E)

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

▶Package C State Control

Package C State

This feature allows the user 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

Software Controlled T-States

This feature enables the software controlled T-States support. The options are **Disable** and Enable

▶Chipset Configuration

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

▶North Bridge

This feature allows the user to configure the following North Bridge settings.

▶UPI Configuration

UPI Configuration

The following information will be displayed:

- Number of CPU
- Number of IIO
- 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

Select **Topology Precedence** to degrade features if system options are in conflict. Select Feature Precedence to degrade topology if system options are in conflict. The options are **Topology Precedence** and Feature Precedence.

Link L0p Enable

Select Enable for the QPI to enter the L0p state for power saving. The options are Disable, Enable, and **Auto**.

Link L1 Enable

Select Enable for the QPI to enter the L1 state for power saving. The options are Disable, Enable, and **Auto**.

IO Directory Cache (IODC)

Use this feature to enable the IO Directory Cache (IODC) support. The options are Disable, **Auto**, Enable for Remote InvItoM Hybrid Push, InvItoM AllocFlow, Enable for Remote InvItoM Hybrid AllocNonAlloc, and Enable for Remote InvItoM and Remote WViLF.

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

Integrated Memory Controller (iMC)

Enforce POR

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

Memory Frequency

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

Data Scrambling for NVMDIMM

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

Data Scrambling for DDR4

Use this feature to enable data scrambling for DDR4. The options are **Auto**, Disable, and Enable.

Enable ADR

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

Refresh Options

Use this item to select the self refresh mode. The options are Accelerated Self Refresh and **2x Refresh**.

▶Memory Topology

The following information will be displayed: P1 DIMMA1/P1 DIMMB1/P1 DIMMC1/P1 DIMMD1/P1 DIMME1/P1 DIMMF1

▶Memory RAS (Reliability_Availability_Serviceability) Configuration

Memory RAS Configuration Setup

Use this submenu to configure the following Memory RAS settings.

Static Virtual Lockstep Mode

Select Enable to support the static virtual lockstep mode. The options are **Disable** and Enable.

Mirror Mode

Use this item to select the mirror mode. The options are **Disable**, Mirror Mode 1LM, and Mirror Mode 2LM. If this item is set to Mirror Mode 1LM or Mirror Mode 2LM, the available memory capacity will be reduced by 50 percent.

UEFI ARM Mirror

Select Enable to support the UEFI-based address range mirroring with setup option. The options are **Disable** and Enable.

Memory Rank Sparing

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

If the item above "Memory Rank Sparing" is set to Enable, the following item will be displayed:

Multi Rank Sparing

Use this feature to set the multiple rank sparing number. The default setting and the maximum is two ranks per channel. The options are One Rank and **Two Rank**.

Correctable Error Threshold

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

SDDC Plus One

Single Device Data Correction (SDDC) allows data to be reconstructed when one of the memory devices fails on a DIMM. Use this feature to enable the SDDC support. The options are **Disable** and Enable.

ADDDC Sparing

Adaptive Double Device Data Correction (ADDDC) Sparing detects the predetermined threshold for correctable errors, copying the contents of the failing DIMM to spare

memory. The failing DIMM or memory rank will then be disabled. The options are **Disable** and Enable.

Patrol Scrub

Patrol Scrubbing is a process that allows the CPU to correct correctable memory errors detected on a memory module and send the correction to the requestor (the original source). When this item is set to Enable, read-and-write will be performed every 16K cycles per cache line if there is no delay caused by internal processing. The options are Disable and **Enable**.

Patrol Scrub Interval

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

▶IIO Configuration

EV DFX Features

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

▶CPU1 Configuration

IOU0 (IIO PCIe Br1)

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

IOU1 (IIO PCIe Br2)

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

IOU2 (IIO PCIe Br3)

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

▶P1_NVMe0

Link Speed

Use this feature to select the link speed for the PCIe port. The options are **Auto**, Gen 1 (2.5 GT/s), Gen 2 (5 GT/s), and Gen 3 (8 GT/s).

PCI-E Port Link Status

PCI-E Port Link Max

PCI-E Port Link Speed

PCI-E Port Max Payload Size

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

▶P1_NVMe1

Link Speed

Use this feature to select the link speed for the PCIe port. The options are **Auto**, Gen 1 (2.5 GT/s), Gen 2 (5 GT/s), and Gen 3 (8 GT/s).

PCI-E Port Link Status

PCI-E Port Link Max

PCI-E Port Link Speed

PCI-E Port Max Payload Size

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

▶AOC-2UR68-I4G SLOT1

(The AOC model varies with your server model.)

Link Speed

This feature allows the user to select PCI-E support for the device installed in the system. The options are **Auto**, Gen 1 (2.5 GT/s), Gen 2 (5 GT/s), and Gen 3 (8 GT/s).

PCI-E Port Link Status

PCI-E Port Link Max

PCI-E Port Link Speed

PCI-E Port Max Payload Size

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

▶AOC-2UR68-I4G SLOT2

(The AOC model varies with your server model.)

Link Speed

This feature allows the user to select PCI-E support for the device installed in the system. The options are **Auto**, Gen 1 (2.5 GT/s), Gen 2 (5 GT/s), and Gen 3 (8 GT/s).

PCI-E Port Link Status

PCI-E Port Link Max

PCI-E Port Link Speed

PCI-E Port Max Payload Size

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

▶AOC-2UR68-I4G SLOT3

(The AOC model varies with your server model.)

Link Speed

This feature allows the user to select PCI-E support for the device installed in the system. The options are **Auto**, Gen 1 (2.5 GT/s), Gen 2 (5 GT/s), and Gen 3 (8 GT/s).

PCI-E Port Link Status

PCI-E Port Link Max

PCI-E Port Link Speed

PCI-E Port Max Payload Size

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

▶CPU2 Configuration

IOU0 (IIO PCIe Br1)

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

IOU1 (IIO PCIe Br2)

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

IOU2 (IIO PCIe Br3)

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

▶RSC-R1UW-E8R SLOT1

Link Speed

This feature allows the user to select PCI-E support for the device installed in the system. The options are **Auto**, Gen 1 (2.5 GT/s), Gen 2 (5 GT/s), and Gen 3 (8 GT/s)..

PCI-E Port Link Status

PCI-E Port Link Max

PCI-E Port Link Speed

PCI-E Port Max Payload Size

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

▶P2_NVMe0

Link Speed

This feature allows the user to select PCI-E support for the device installed in the system. The options are **Auto**, Gen 1 (2.5 GT/s), Gen 2 (5 GT/s), and Gen 3 (8 GT/s)..

PCI-E Port Link Status

PCI-E Port Link Max

PCI-E Port Link Speed

PCI-E Port Max Payload Size -

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

▶P2_NVMe1

Link Speed

This feature allows the user to select PCI-E support for the device installed in the system. The options are **Auto**, Gen 1 (2.5 GT/s), Gen 2 (5 GT/s), and Gen 3 (8 GT/s)..

PCI-E Port Link Status

PCI-E Port Link Max

PCI-E Port Link Speed

PCI-E Port Max Payload Size -

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

▶RSC-R2UW-4E8 SLOT1

Link Speed

This feature allows the user to select PCI-E support for the device installed in the system. The options are **Auto**, Gen 1 (2.5 GT/s), Gen 2 (5 GT/s), and Gen 3 (8 GT/s)..

PCI-E Port Link Status

PCI-E Port Link Max

PCI-E Port Link Speed

PCI-E Port Max Payload Size

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

▶RSC-R2UW-4E8 SLOT2

Link Speed

This feature allows the user to select PCI-E support for the device installed in the system. The options are **Auto**, Gen 1 (2.5 GT/s), Gen 2 (5 GT/s), and Gen 3 (8 GT/s)..

PCI-E Port Link Status

PCI-E Port Link Max

PCI-E Port Link Speed

PCI-E Port Max Payload Size

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

▶RSC-R2UW-4E8 SLOT3

Link Speed

This feature allows the user to select PCI-E support for the device installed in the system. The options are **Auto**, Gen 1 (2.5 GT/s), Gen 2 (5 GT/s), and Gen 3 (8 GT/s)..

PCI-E Port Link Status

PCI-E Port Link Max

PCI-E Port Link Speed

PCI-E Port Max Payload Size

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

▶RSC-R2UW-4E8 SLOT4

Link Speed

This feature allows the user to select PCI-E support for the device installed in the system. The options are **Auto**, Gen 1 (2.5 GT/s), Gen 2 (5 GT/s), and Gen 3 (8 GT/s)..

PCI-E Port Link Status

PCI-E Port Link Max

PCI-E Port Link Speed

PCI-E Port Max Payload Size

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

▶IOAT (Intel IO Acceleration) Configuration

Disable TPH

Select Yes to deactivate TLP Processing Hint support. The options are **No** and Yes.

Prioritize TPH

Use this feature to enable the prioritize TPH support. The options are Enable and **Disable**.

Relaxed Ordering

Select Enable to enable Relaxed Ordering support which will allow certain transactions to violate the strict-ordering rules of PCI bus for a transaction to be completed prior to 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 support by reporting the I/O device assignments to the VMM (Virtual Machine Monitor) through the DMAR ACPI Tables. This feature offers fully-protected I/O resource sharing across Intel® platforms, providing greater reliability, security and availability in networking and data-sharing. The options are **Enable** and Disable.

Interrupt Remapping

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

PassThrough DMA

Select Enable to use the Non-Isoch VT_D engine pass through DMA support. The options are **Enable** and Disable.

ATS

Select Enable to use the Non-Isoch VT_D engine ATS support. The options are **Enable** and Disable.

Posted Interrupt

Use this feature to enable VT_D posted interrupt. The options are **Enable** and Disable.

Coherency Support (Non-Isoch)

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

▶Intel® VMD technology

This section describes the configuration settings for the Intel® Volume Management Device (VMD) Technology.

▶Intel® VMD for Volume Management Device on CPU1

Intel® VMD for Volume Management Device for PStack0

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

If this feature is set to* **Enable*, the following features are available:*

P1_NVMe0 VMD

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

P1_NVMe1 VMD

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

Hot Plug Capable

Use this feature to enable the hot plug support for PCIe root ports 1A–1D. The options are **Disable** and Enable.

Intel® VMD for Volume Management Device for PStack1

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

If this feature is set to* **Enable*, the following features are available.)*

AOC-2UR68-I4G* SLOT1 VMD

(*The AOC model varies with your server model.)

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

AOC-2UR68-I4G* SLOT3 VMD

(*The AOC model varies with your server model.)

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

Hot Plug Capable

Use this feature to enable the hot plug support for PCIe root ports 2A–2D. The options are Disable and **Enable**.

Intel® VMD for Volume Management Device for PStack2

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

If this feature is set to* **Enable*, the following features are available.)*

AOC-2UR68-I4G* SLOT2 VMD

(*The AOC model varies with your server model.)

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

Hot Plug Capable

Use this feature to enable the hot plug support for PCIe root ports 3A–3D. The options are Disable and **Enable**.

▶Intel® VMD for Volume Management Device on CPU2

Intel® VMD for Volume Management Device for PStack0

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

If this feature is set to* **Enable*, the following features are available:*

RSC-R1UW-E8R SLOT1 VMD

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

P2_NVMe0 VMD

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

P2_NVMe1 VMD

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

Hot Plug Capable

Use this feature to enable the hot plug support for PCIe root ports 1A–1D. The options are **Disable** and Enable.

Intel® VMD for Volume Management Device for PStack1

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

**If this feature is set to Enable, the following features are available:*

RSC-R2UW-4E8 SLOT1 VMD
Select Enable to use the Intel Volume Management Device Technology for this root port. The options are **Disable** and Enable.

RSC-R2UW-4E8 SLOT2 VMD
Select Enable to use the Intel Volume Management Device Technology for this root port. The options are **Disable** and Enable.

Hot Plug Capable

Use this feature to enable the hot plug support for PCIe root ports 2A–2D. The options are Disable and **Enable**.

Intel® VMD for Volume Management Device for PStack2
Select Enable to use the Intel Volume Management Device Technology for this stack. The options are Disable and **Enable**.

**If this feature is set to Enable, the following features are available:*

RSC-R2UW-4E8 SLOT3 VMD
Select Enable to use the Intel Volume Management Device Technology for this root port. The options are **Disable** and Enable.

RSC-R2UW-4E8 SLOT4 VMD
Select Enable to use the Intel Volume Management Device Technology for this root port. The options are **Disable** and Enable.

Hot Plug Capable

Use this feature to enable the hot plug support for PCIe root ports 3A–3D. The options are Disable and **Enable**.

IIO-PCIE Express Global Options

PCI-E Completion Timeout Disable

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

▶South Bridge

The following South Bridge information will be displayed:

- USB Module Version
- USB Devices

Legacy USB Support

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

XHCI Hand-off

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

Port 60/64 Emulation

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

▶Server ME Configuration

This feature displays the following system ME configuration settings.

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

▶PCH SATA Configuration

SATA Controller

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

Configure SATA as

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

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

Aggressive Link Power Management

When this item is set to Enable, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link to a low power state when the I/O is inactive for an extended period of time, and the power state will return to normal when the I/O becomes active. The options are **Disable** and Enable.

If the item above "Configure SATA as" is set to AHCI, the following items will be displayed:

SATA Port 0~ Port 7

This item displays the information detected on the installed SATA drive on the particular SATA port.

- Model number of drive and capacity
- Software Preserve Support

Hot Plug (SATA Port 0~ Port 7)

Select Enabled to enable a SATA port specified by the user. The options are **Disable** and Enable.

Spin Up Device (SATA Port 0~ Port 7)

On an edge detect from 0 to 1, set this item to allow the PCH to initialize the device. The options are **Disable** and Enable.

SATA Device Type (SATA Port 0~ Port 7)

Use this item to specify if 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.

If the item above "Configure SATA as" is set to RAID, the following items will be displayed:

SATA RSTe Boot Info

Select Enable to provide the full int13h support for SATA controller attached devices. The options are Disable and **Enable**.

Aggressive Link Power Management

When this item is set to Enable, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link to a low power state when the I/O is inactive for an extended period of time, and the power state will return to normal when the I/O becomes active. The options are **Disable** and Enable.

SATA RAID Option ROM/UEFI Driver

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~ Port 7

This item displays the information detected on the installed SATA drive on the particular SATA port.

- Model number of drive and capacity
- Software Preserve Support

Hot Plug (SATA Port 0~ Port 7)

Select Enabled to enable a SATA port specified by the user. The options are **Disable** and Enable.

Spin Up Device (SATA Port 0~ Port 7)

On an edge detect from 0 to 1, set this item to allow the PCH to initialize the device. The options are **Disable** and Enable.

SATA Device Type (SATA Port 0~ Port 7)

Use this item to specify if 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

sSATA Controller

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

Configure sSATA as

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

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

Aggressive Link Power Management

When this item is set to Enable, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link to a low power state when the I/O is inactive for an extended period of time, and the power state will return to normal when the I/O becomes active. The options are **Disable** and Enable.

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

sSATA Port 0~ Port 5

This item displays the information detected on the installed SATA drive on the particular SATA port.

- Model number of drive and capacity
- Software Preserve Support

Hot Plug (sSATA Port 0~ Port 5)

Select Enabled to enable a SATA port specified by the user. The options are **Disable** and Enable.

Spin Up Device (sSATA Port 0~ Port 5)

On an edge detect from 0 to 1, set this item to allow the PCH to initialize the device. The options are **Disable** and Enable.

sSATA Device Type (sSATA Port 0~ Port 5)

Use this item to specify if 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.

If the item above "Configure SATA as" is set to RAID, the following items will be displayed:

sSATA RSTe Boot Info

Select Enable to provide the full int13h support for SATA controller attached devices. The options are Disable and **Enable**.

sSATA RAID Option ROM/UEFI Driver

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~ Port 5

This item displays the information detected on the installed SATA drive on the particular SATA port.

- Model number of drive and capacity
- Software Preserve Support

Hot Plug (sSATA Port 0~ Port 5)

Select Enabled to enable a SATA port specified by the user. The options are **Disable** and Enable.

Spin Up Device (sSATA Port 0~ Port 5)

On an edge detect from 0 to 1, set this item to allow the PCH to initialize the device. The options are **Disable** and Enable.

sSATA Device Type (sSATA Port 0~ Port 5)

Use this item to specify if 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.

▶PCIe/PCI/PnP Configuration

The following 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 Disabled and **Enabled**.

SR-IOV Support

Use this feature to enable or disable Single Root IO Virtualization support. The options are **Disabled** and Enabled.

MMIO High Base

Use this item to select the base memory size according to memory-address mapping for the IO hub. The options are **56T**, 40T, 24T, 16T, 4T, and 1T.

MMIO High Granularity Size

Use this item 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.

PCI PERR/SERR Support

Select Enabled to activate PCI Error and System Error report handling. The options are Disabled and **Enabled**.

Maximum Read Request

Select Auto to allow the system BIOS to automatically set the maximum read request size 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

Use this feature to select the default value for the PCI MMIO (Memory-Mapped IO) base address. The options are 1G, 1.5G, 1.75G, **2G**, 2.25G, and 3G.

NVMe Firmware Source

Use this item to select the NVMe firmware to support booting. The options are **Vendor Defined Firmware** and AMI Native Support. The default option, **Vendor Defined Firmware**, is pre-installed on the drive and may resolve errata or enable innovative functions for the drive. The other option, AMI Native Support, is offered by the BIOS with a generic method.

VGA Priority

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

RSC-R1UW-E8RSLOT(1-4) PCI-E X8 OPROM

Select Disabled to deactivate the selected slots, Legacy to activate the slot in legacy mode, and EFI to activate the slot in EFI mode. The options are Disabled, **Legacy**, and EFI.

Onboard LAN Option ROM Type

Use this to select firmware type to be loaded for onboard LANs. The options are **Legacy** and EFI.

Onboard NVME1/NVME2/NVME3/NVME4 Option ROM

Select EFI to allow the user to boot the computer using an EFI (Expansible 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 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 UEFI (Unified Extensible Firmware Interface) for network stack support. The options are Disabled and **Enabled**.

If this feature is set to* **Enable*, the following features are available:*

Ipv4 PXE Support

Select Enabled to enable Ipv4 PXE boot support. The options are Disabled and **Enabled**.

Ipv4 HTTP Support

Select Enabled to enable Ipv4 HTTP boot support. The options are **Disabled** and Enabled.

Ipv6 PXE Support

Select Enabled to enable Ipv6 PXE boot support. The options are Disabled and **Enabled**.

Ipv6 HTTP Support

Select Enabled to enable Ipv6 HTTP boot support. The options are **Disabled** and Enabled.

PXE boot wait time

Use this option to specify the wait time to press the ESC key to abort the PXE boot. Press "+" or "-" on your keyboard to change the value. The default setting is **0**.

Media detect count

Use this option to specify the number of times media will be checked. Press "+" or "-" on your keyboard to change the value. The default setting is **1**.

▶Super IO Configuration

Super IO Configuration

The following Super IO information will be displayed:

- Super IO Chip AST2500

▶Serial Port 1 Configuration

Serial Port 1 Configuration

This submenu allows the user the configure settings of Serial Port 1.

Serial Port 1

Select Enabled to enable the selected onboard serial port. The options are Disabled and **Enabled**.

Device Settings

This item displays the status of a serial part specified by the user.

Change Settings

This feature specifies the base I/O port address and the Interrupt Request address of a serial port specified by the user. Select Auto to allow the BIOS to automatically assign the base I/O and IRQ address. The options are **Auto**, (IO=3F8h; IRQ=4;), (IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;), (IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;), (IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;), and (IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;).

▶Serial Port 2 Configuration

Serial Port 2 Configuration

This submenu allows the user the configure settings of Serial Port 2.

Serial Port 2

Select Enabled to enable the selected onboard serial port. The options are Disabled and **Enabled**.

Device Settings

This item displays the status of a serial part specified by the user.

Change Settings

This feature specifies the base I/O port address and the Interrupt Request address of a serial port specified by the user. Select Auto to allow the BIOS to automatically assign the base I/O and IRQ address. The options are **Auto**, (IO=2F8h; IRQ=3;), (IO=3F8h; IRQ=3, 4, 5, 6,

7, 9, 10, 11, 12;), (IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;), (IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;), and (IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;).

Serial Port 2 Attribute (Available for Serial Port 2 only)

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

▶Serial Port Console Redirection

COM1

Console Redirection

Select Enabled to enable console redirection support for a serial port specified by the user. The options are **Disabled** and Enabled.

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

▶Console Redirection Settings

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

COM1

Console Redirection Settings

Terminal Type

This feature allows the user 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 VT100, **VT100+**, VT-UTF8, and ANSI.

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 and **8**.

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 Disabled and **Enabled.**

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 the settings for the function keys and the key pad used for Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, LINUX, XTERMR6, SC0, ESCN, and VT400.

Redirection After BIOS POST

Use this feature to enable or disable legacy console redirection after BIOS POST. When this feature is set to BootLoader, legacy console redirection is disabled before booting the OS. When this feature is set to Always Enable, legacy console redirection remains enabled when booting the OS. The options are **Always Enable** and BootLoader.

SOL

Console Redirection

Select Enabled to enable console redirection support for a serial port specified by the user. The options are Disabled and **Enabled**.

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

▶Console Redirection Settings

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

SOL

Console Redirection Settings

Terminal Type

This feature allows the user 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 VT100, **VT100+**, VT-UTF8, and ANSI.

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 and **8**.

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 Disabled and **Enabled.**

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 the settings for the function keys and the key pad used for Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, LINUX, XTERMR6, SC0, ESCN, and VT400.

Redirection After BIOS POST

Use this feature to enable or disable legacy console redirection after BIOS POST. When this feature is set to BootLoader, legacy console redirection is disabled before booting the OS. When this feature is set to Always Enable, legacy console redirection remains enabled when booting the OS. The options are **Always Enable** and BootLoader.

Legacy Console Redirection

Legacy Serial Redirection Port

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

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

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

Console Redirection

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

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

▶Console Redirection Settings

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

Out-of-Band Management Port

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

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 VT100, VT100+, **VT-UTF8**, and ANSI.

Bits Per second

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

Flow Control

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

The settings below are displayed:

Data Bits, Parity, Stop Bits

▶ACPI Settings

NUMA (Available when the OS supports this feature)

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

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 Disabled and **Enabled**.

High Precision Event Timer

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

▶Trusted Computing (Available when a TPM device is installed and detected by the BIOS)

Security Device Support

If a Trusted Platform Module (TPM) device is connected to the TPM header (JTPM1) on the motherboard and this feature is set to Enable, onboard security devices will be available for the TPM support to enhance data integrity and network security. Please reboot the system for a change on this setting to take effect. The options are Disable and **Enable**.

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

The following Platform Configuration Register information will be displayed:

- **Active PCR banks**
- **Available PCR banks**

SHA-1 PCR Bank

Use this item to disable or enable the SHA-1 Platform Configuration Register (PCR) bank for the installed TPM device. The options are Disabled and **Enabled**.

SHA256 PCR Bank

Use this item to disable or enable the SHA256 Platform Configuration Register (PCR) bank for the installed TPM device. The options are Disabled and **Enabled**.

Pending operation

Use this item to schedule a TPM-related operation to be performed by a security device for system data integrity. Your system will reboot to carry out a pending TPM operation. The options are **None** and TPM Clear.

Platform Hierarchy

Use this item to disable or enable platform hierarchy for platform protection. The options are Disabled and **Enabled**.

Storage Hierarchy

Use this item to disable or enable storage hierarchy for cryptographic protection. The options are Disabled and **Enabled**.

Endorsement Hierarchy

Use this item to disable or enable endorsement hierarchy for privacy control. The options are Disabled and **Enabled**.

PH Randomization

Use this feature to disable or enable Platform Hierarchy Randomization. The options are **Disabled** and Enabled.

TXT Support

Intel® TXT (Trusted Execution Technology) helps protect against software-based attacks and ensures protection, confidentiality, and integrity of data stored or created on the system. Use this feature to enable or disable TXT Support. The options are **Disabled** and Enabled.

▶HTTP Boot Configuration

Use this feature to configure HTTP Boot settings for your system.

Http Boot One Time

If this feature is set to Enabled, the system will automatically boot into the HttpBoot setting that has been previously configured when it is powered up the first time. The options are **Disabled** and Enabled.

Input the Description

This feature allows the user to input the description of the boot.

Boot URI

This feature allows the user to boot the system from a network connection.

▶TLS Authenticate Configuration

When this submenu is selected, the following features 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

iSCSI Initiator Name

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

▶Add an Attempt

▶Delete Attempts

▶Change Attempt order

▶Intel® Virtual RAID on CPU

This submenu displays the information of the Intel VMD controllers as detected by the BIOS.

▶Intel® Optane(TM) DC Persistent Memory Configuration

(Available when a DCPMM device is plugged in)

This submenu configures DCPMM device parameters and displays driver version.

Note: All DCPMM items and strings displayed on the BIOS screen are provided by Intel and may vary with the driver version.

Version: 1.0.0.3380

Select an action below.

Detected DIMMs: This feature displays the number of DIMMs as detected by the system.

All DIMMs are healthy.

▶DIMMs

This feature configures and displays the information of a selected DCPMM.

Select a specific DIMM to view more information.

DIMMs on socket 0x0000: *(an example socket ID; several may be available)*

▶DIMM ID 0x0001 *(an example DIMM ID; several may be available)*

Press <Enter> and the following information regarding this DIMM is displayed.

View settings or select an action below.

(The values below are examples; yours may vary)

DIMM UID 8089-A2-1837-0000115D

DIMM handle 0x0001

DIMM physical ID 0x0019

Manageability state [Manageable]

Health state [Healthy]

Health state reason None

Capacity 252.4 GiB

Firmware version 01.00.00.5127

Firmware API Version 01.11

Lock state [Disabled]

Staged firmware version N/A

Firmware update status Update loaded successfully

Manufacturer Intel

Show more details +

Enable this feature to display additional information about this DIMM. The options are **Disabled** and Enabled.

If the feature,* ***Show more details +**, is set to Enabled, the following will be displayed:*

Serial number	**0x0000115D**
Part number	**NMA1XBD256GQS**
Socket	**0x0**
Memory controller ID	**0x0**
Vendor ID	**0x8089**
Device ID	**0x5141**
Subsystem vendor ID	**0x8089**
Subsystem device ID	**0x97A**
Device locator	**P1-DIMMA2**
Subsystem revision ID	**0x18**
Interface format code	**0x0301 (Non-Energy Backed Byte Addressable)**
Manufacturing info valid	**1**
Manufacturing date	**18-37**
Manufacturing location	**0xA2**
Memory type	**Logical Non-Volatile Device**
Memory bank label	**P0_Node0_Channel0_Dimm1**
Data width label [b]	**64**
Total width [b]	**72**
Speed [MHz]	**2666**
Channel ID	**0x0000**
Channel position	**1**
Revision ID	**0x0**
Form factor	**[DIMM]**
Manufacturer ID	**0x8089**
Controller revision ID	**B0 (0x0020)**
Is new	**0**
Memory capacity	**252.0 GiB**

App Direct capacity **0 B**

Unconfigured capacity **0 B**

Inaccessible capacity **0 B**

Reserved capacity **465.2 MiB**

Peak power budget [mW] **20000**

Avg power budget [mW] **15000**

Max average power budget [mW] **10000**

Package sparing capable **1**

Package sparing enabled **1**

Package spares available **1**

Configuration status **[Valid]**

SKU violation **0**

ARS status **[Completed]**

Overwrite DIMM status **[Not started]**

Last shutdown time **Fri Dec 21 17:29:23 UTC 2018**

First fast refresh **0**

Viral policy enable **0**

Viral state **0**

Latched Last shutdown status:

PM ADR Command Received, DDRT Power Fail Command Received, PMIC 12V/ DDRT 1.2V Power Loss (PLI), Controller's FW State Flush Complete, Write Data Flush Complete, PM Idle Received

Unlatched last shutdown status: **Unknown**

Security capabilities **Encryption, Erase**

Modes supported **Memory Mode, App Direct**

Boot status **Success**

AIT DRAM enabled **[1]**

Error injection enabled **[0]**

Media temperature injection enabled **[0]**

Software triggers enabled **[0]**

Software triggers enabled details **None**

Poison error injection counter 0

Poison error clear counter 0

Media temperature injection counter 0

Software triggers counter 0

Master Passphrase Enabled 0

▶Monitor health

Sensor Type [Health]

Value <Healthy>

Sensor Type [Controller temperature]

Value <42 C>

Non-critical threshold 98

Critical lower threshold 99

Critical upper threshold 98

Fatal threshold 102

State [Normal]

Alarm enabled state
Use this setting to establish the non-critical threshold alarm. Choices are **1** and 0.

Sensor Type [Media temperature]

Value <39 C>

Non-critical threshold 82

Critical lower threshold 83

Critical upper threshold 83

Fatal threshold 85

State [Normal]

Alarm enabled state
Use this setting to establish the non-critical threshold alarm. Choices are **1** and 0.

Sensor Type [Percentage remaining]

Value <100 %>

Non-critical threshold 50

State [Normal]

Alarm enabled state
Use this setting to establish the non-critical threshold alarm. Choices are **1** and 0.

Sensor Type [Latched dirty shutdown count]

Value <6>

Sensor Type [Power on time]

Value <7172661 S>

Sensor Type [Up time]

Value <345287 S>

Sensor Type [Power cycles]

Value <1783>

Sensor Type [FW error count]

Value <8>

Sensor Type [Unlatched dirty shutdown count]

Value <138>
Modify non-critical thresholds

Controller temperature [C] 98

Media temperature [C] 82

Percentage remaining [%] 50

▶Apply changes

Press <Enter> to apply changes.

▶Update firmware

Specify the firmware image to load on the DIMMs on the next system restart and select Update.

Current firmware version: 01.00.00.5127

Selected firmware version: None

File:
Press <Enter> and type in the file path relative to the root directory of the device containing the new firmware image file, such as "\firmware\newFirmware.bin".

Staged firmware version: N/A

▶Update

Press <Enter> to update firmware.

▶Configure security

Specify the security settings on ALL the DIMMs.

State: [Disabled]
Shows current state [Disabled, Frozen]

Enable security
Use this feature to enable security by entering a new passphrase. Press <Enter> to type in a new passphrase with at least one character.

Secure erase
Use this feature to erase all persistent data. The options are Yes and No

Freeze lock
Use this feature to prevent further lock state changes until the next reboot.

▶Configure data policy

Specify the data policy settings on ALL the DIMMs.

First fast refresh state: Disabled or Enabled
Depending on the settings of the following feature, Enable/Disable first fast refresh, [Disabled] or [Enabled] will be displayed.

▶Enable/Disable first fast refresh

Use this feature to enable/disable the feature above, First fast refresh state.

▶Regions

Use this submenu to configure and display regions.

Current configuration

▶Region ID1

Region ID: 0x0001

DIMM ID: 0x1011, 0x1021

ISet ID: 0x00000000000000000

Persistent memory type: App Direct

Capacity: 1004.0 GiB

Free capacity: 1044.0 GiB

Health: Pending

Socket ID: 0x0001

Memory allocation goal configuration

▶**DIMM ID 0x001** *(an example DIMM ID; several may be available)*

Socket ID: 0x0001

DIMM ID: 0x1001

Memory Mode size: 0 B

App Direct #1 size: 170.0 GiB

App Direct #1 index: 1

App Direct #1 settings x6 - 4KB IMC x 4KB Channel

App Direct #2 size: 0 B

App Direct #2 index: N/A

App Direct #2 settings N/A

A reboot is required for the memory allocation goal to be processed by the BIOS.

▶Create goal config

Use this submenu to create goal configuration of DIMM regions.

Select the scope of the new region then set the desired sizes.

Create goal config for:

Use this feature to select target to create goal configuration. The options are **Platform** and Socket.

Reserved [%]:

Enter a value (0-100) to reserve a percentage of the requested DIMM capacity that will not be mapped into the system physical address space.

Memory Mode [%]:

Enter a value (0-100) to set the percentage of the total capacity to use in Memory Mode.

Persistent memory type:

Use this feature to select the type of the persistent memory capacity to create. The options are **App Direct** and App Direct Not interleaved.

Namespace Label version:
While creating goals, use this feature to display and modify the namespace label version to initialize. The options are 1.2 and 1.1.

▶Create goal config

Use this to create goal configuration of the DIMM regions.

▶Delete goal config

Use this to discard the region goal configuration.

▶Namespaces

Use this submenu to display, create, modify, and delete namespaces.

Select a namespace to view more information.

*(*If a namespace has been created, it is displayed here.)*

NamespaceID Name Health Status.

▶0x00000101 Healthy

Use this feature to display details for or modify selected namespace.

View details for or modify selected namespace.

UUID 66B9E696-0E38-47B3-81

5E-99FFAFC26A23

ID 0x00000101

Name
Press <Enter> to type in a name of namespace.

Region 1

Health [Healthy]

Mode [None]

Block size [4096 B]

Units
Use this feature to change the units of the input namespace capacity. The options are B, MB, MiB, GB, GiB, TB, and TiB.

Capacity 125.0

Label version 1.2

▶Save

Use this feature to save current namespace.

▶Delete

Use this feature to delete current namespace.

▶Create namespace

Name
Press <Enter> to type in a name of namespace.

Region ID
This feature displays the region ID on which to create namespace.

Mode
Use this feature to set namespace mode. The options are **None** and Sector. The option, None, is for raw access only. Set this feature to Sector to guarantee powerfail write automicity via a block translation table (BTT)

Capacity input
The options are **Remaining** and Manual. Set this feature to Remaining to use the maximum available capacity. Set this feature to Manual to enter the capacity manually.

Units
Use this feature to change the units of the input namespace capacity. The options are B, MB, MiB, GB, **GiB**, TB, and TiB.

Capacity
This feature displays the capacity of namespace.

▶Create namespace

Press <Enter> to create a namespace with the above configuration.

▶Total capacity

The following information is displayed.

Total DCPMM resource allocation across the host server.

Raw capacity: 2.9 TiB

App Direct capacity: 1004.0 GiB

Memory capacity: 0 B

Unconfigured capacity: **0 TiB**

Inaccessible capacity: **3.5 GiB**

Reserved capacity: **1.9 TiB**

▶Diagnostics

Perform diagnostic tests on DIMMS.

Choose diagnostics type:

Quick diagnostics

Select Enabled to perform quick diagnostics test. The options are Disabled and **Enabled**.

DIMM ID 0x0001

Select Enabled to enable the diagnostics procedure for this DIMM. The options are Disabled and **Enabled**.

DIMM ID 0x0101

Select Enabled to enable the diagnostics procedure for this DIMM. The options are Disabled and **Enabled**.

(Additional DIMMs are listed if detected.)

Config diagnostics

Select Enabled to enable the platform configuration diagnostics test. The options are Disabled and **Enabled**.

FW diagnostics

Select Enabled to enable the firmware diagnostics test. The options are Disabled and **Enabled**.

Security diagnostics

Select Enabled to enable the security diagnostics test. The options are Disabled and **Enabled**.

▶Execute tests

Press <Enter> to perform the selected diagnostic tests. The following information is displayed.

TestName: Quick

State: Ok

Message:

The quick health check succeeded.

TestName: Config

State: Ok

Message:
The platform configuration check succeeded.

TestName: Security

State: Ok

Message:
The security check succeeded.

TestName: FW

State: Ok

Message:
The firmware consistency and settings check succeeded.

▶Preferences

Use this submenu to display or modify user preferences.

View and/or modify user preferences.

Default DIMM ID:

Use this feature to modify the default display of DIMM identifiers. The options are **Handle** and UID.

Capacity units:

This feature is to modify the default units for displaying capacities. Use auto (x1024) or Auto_10 (x1000) to automatically select the best format. The options are **Auto**, Auto_10, B, MB, MiB, GB, GiB, TB, and TiB .

App Direct settings:

This feature is to view or modify the interleaving settings for creating App Direct capacity. The default setting is 4KB_4KB (Recommended).

App Direct granularity:

This feature is to or modify the minimum App Direct granularity per DIMM. The options are **Recommended** and 1.

▶Driver Health

This submenu displays the health status of the drivers and controllers as detected by the system. The following information is displayed.

▶Intel(R) DCPMM 1.0.0.3380 Driver Healthy

Intel(R) DCPMM Controller Healthy

Intel Persistent Memory DIMM 25 Controller Healthy

Intel Persistent Memory DIMM 33 Controller Healthy

Intel Persistent Memory DIMM 41 Controller Healthy

(Additional controllers are listed if detected.)

▶Intel(R) DCPMM 1.0.0.3380 HII Driver Healthy

Controller 665c5c98 Child 0 Healthy

▶Intel(R) 10GbE Driver 7.0.19 x64 Healthy

Controller 63f38f18 Child 0 Healthy

Intel(R) Ethernet Controller 10 Gigabit X540-AT2 Healthy

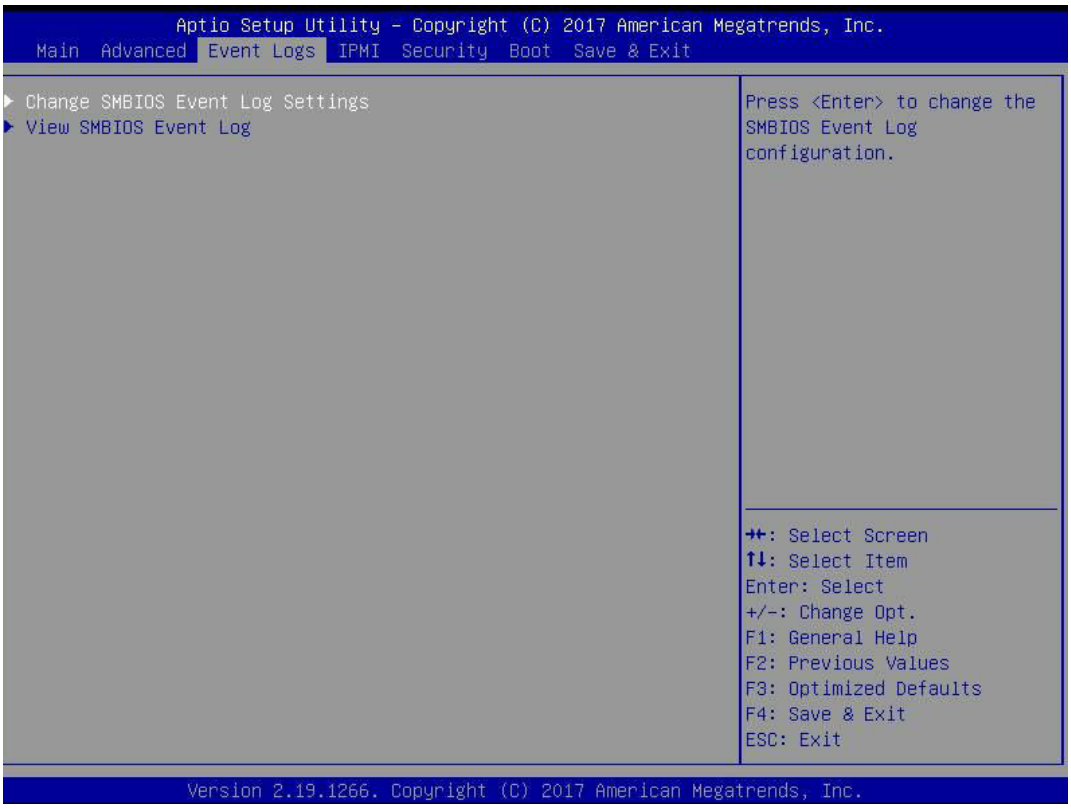
Controller 63f37398 Child 0 Healthy

Intel(R) Ethernet Controller 10 Gigabit X540-AT2 Healthy

▶Intel(R) PRO/1000 8.5.21 PCI-E Healthy

6.4 Event Logs

Use this tab page to configure Event Log settings.



▶Change SMBIOS Event Log Settings

Enabling/Disabling Options

SMBIOS Event Log

Change this item to enable or disable all features of the SMBIOS (System Management BIOS) Event Logging during system boot. The options are Disabled and **Enabled**.

Erasing Settings

Erase Event Log

If No is selected, data stored in the event log will not be erased. Select Yes, Next Reset, data in the event log will be erased upon next system reboot. Select Yes, Every Reset, data in the event log will be erased upon every system reboot. The options are **No**, (Yes, Next reset), and (Yes, Every reset).

When Log is Full

Select Erase Immediately for all messages to be automatically erased from the event log when the event log memory is full. The options are **Do Nothing** and Erase Immediately.

SMBIOS Event Log Standard Settings

Log System Boot Event

This option toggles the System Boot Event logging to enabled or disabled. The options are Enabled and **Disabled**.

MECI

The Multiple Event Count Increment (MECI) counter counts the number of occurrences that a duplicate event must happen before the MECI counter is incremented. This is a numeric value. The default value is **1**.

METW

The Multiple Event Time Window (METW) defines number of minutes must pass between duplicate log events before MECI is incremented. This is in minutes, from 0 to 99. The default value is **60**.

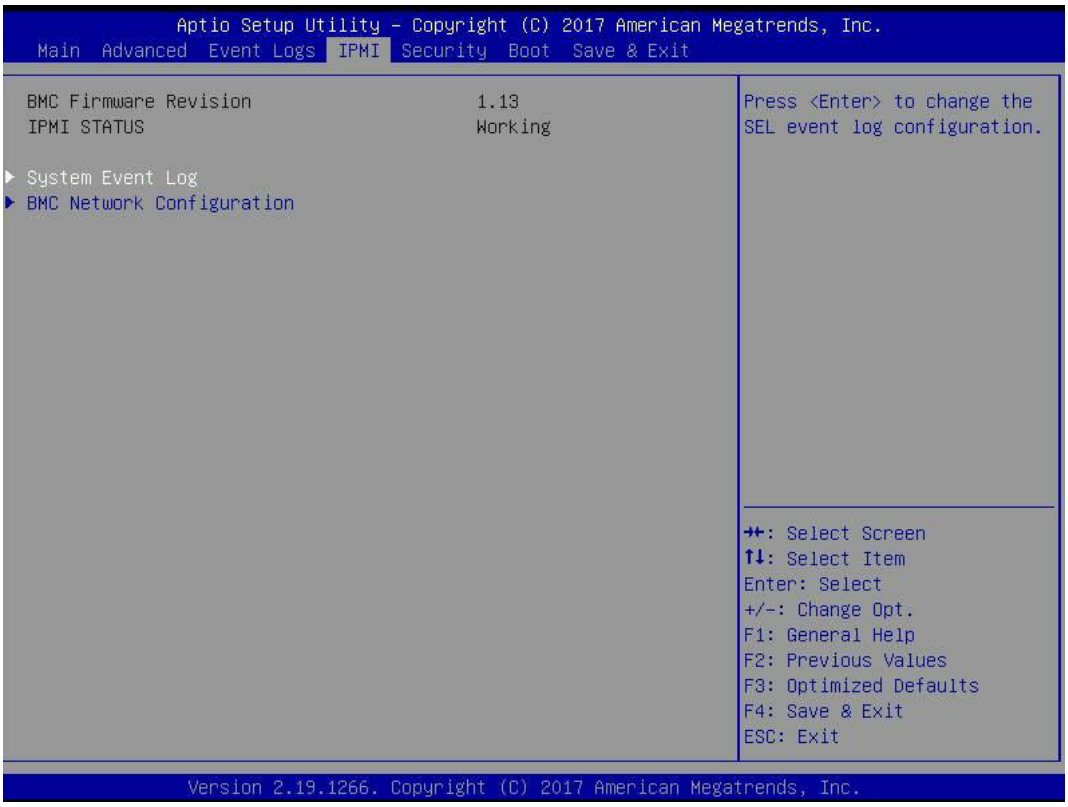
Note: After making changes on a setting, be sure to reboot the system for the changes to take effect.

▶View SMBIOS Event Log

This section displays the contents of the SMBIOS Event Log.

6.5 IPMI

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



BMC Firmware Revision

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

IPMI STATUS (Baseboard Management Controller)

This item indicates the status of the IPMI firmware installed in your system.

▶System Event Log

Enabling/Disabling Options

SEL Components

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

Erasing Settings

Erase SEL

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

When SEL is Full

This feature allows the user to decide 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.

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

▶BMC Network Configuration

BMC Network Configuration

Configure IPV4 support

IPMI LAN Selection

This item displays the IPMI LAN setting. The default setting is **Failover**.

IPMI Network Link Status

This item displays the IPMI Network Link status. The default setting is **Shared LAN**.

Update IPMI LAN Configuration

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

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

Configuration Address Source

This feature allows the user to select the source of the IP address 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, the BIOS will search for a DHCP (Dynamic Host Configuration Protocol) server in the network that is attached to and request the next available IP address for this computer. The options are Static and **DHCP**.

This item displays the current configuration address for this computer.

Station IP Address

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

Subnet Mask

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

Station MAC Address

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

Gateway IP Address

This item displays the Gateway IP address for this computer. This should be in decimal and in dotted quad form (i.e., 172.31.0.1).

VLAN

Use this item to enable or disable the IPMI VLAN function. The options are **Disable** and Enable.

If the item above is set to Enable, the item below "VLAN ID" will become available for user's configuration:

VLAN ID

Use this item to enter the VLAN ID. The default setting is **0**.

Configure IPV6 support

Lan channel 1

IPV6 Support

This item displays the IPMI LAN setting. The default setting is **Enabled**.

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

Configuration Address Source

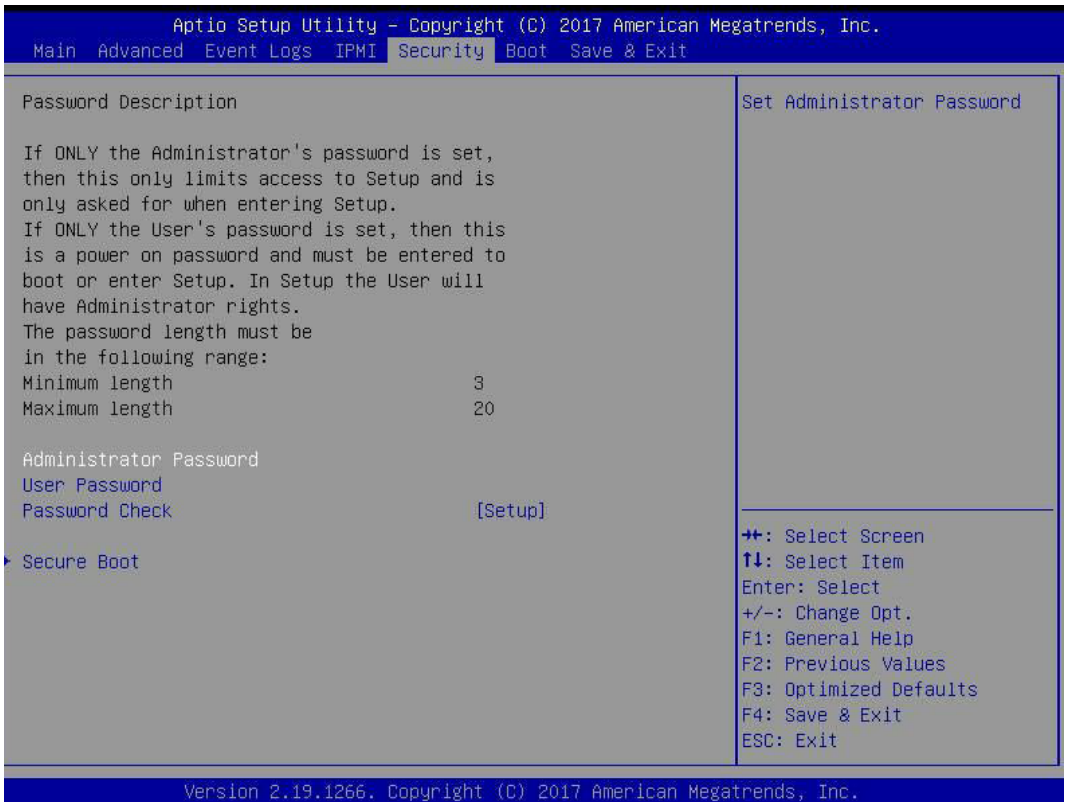
This feature allows the user to select the source of the IP address for this computer. If Static is selected, you will need to know the IP address of this computer and enter it to the system manually in the field. If DHCP is selected, the BIOS will search for a DHCP (Dynamic Host Configuration Protocol)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

The following information is displayed:

- Current Configuration Address source
- Station IPV6 address
- Prefix Length
- IPV6 Router1 IP Address
- IPV6 address status
- IPV6 DHCP Algorithm

6.6 Security

Use this tab page to configure Security settings.



Administrator Password

Press Enter 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.

User Password

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

Password Check

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

▶Secure Boot

This section displays the contents of the following secure boot features:

- System Mode
- Secure Boot
- Vendor Keys

Secure Boot

Use this item to enable secure boot. The options are **Disabled** and Enabled.

Secure Boot Mode

Use this item to select the secure boot mode. The options are Standard and **Custom**.

CSM Support

Select Enabled to support the EFI Compatibility Support Module (CSM), which provides compatibility support for traditional legacy BIOS for system boot. The options are Disabled and **Enabled**.

▶Key Management

This submenu allows the user to configure the following Key Management settings.

Provision Factory Defaults

Select Enabled to install the default Secure-Boot keys set by the manufacturer. The options are **Disabled** and Enabled.

▶Enroll all Factory Default Keys

Select Yes to install all default secure keys set by the manufacturer. The options are **Yes** and No.

▶Enroll Efi Image

This feature allows the image to run in Secure Boot Mode. Enroll SHA256 Hash Certicate of the image into the Authorized Signature Database.

▶Save all Secure Boot variables

This feature allows the user to decide if all secure boot variables should be saved.

Secure Boot variable: Size/Key#/Key Source

▶Platform Key (PK)

This feature allows the user to configure the settings of the platform keys.

Set New

Use this feature to load the new platform keys (PK) from the manufacturer's defaults.

▶Key Exchange Keys (KEK)

Select Set New to load the KEK from the manufacturer's defaults. Select Append to add the KEK from the manufacturer's defaults list to the existing KEK. The default setting is **Set New**.

▶Authorized Signatures

Authorized Signature Database (DB) contains authorized signing certificates and digital signatures. Select Set New to load the DB from the manufacturer's defaults. Select Append to add the database from the manufacturer's defaults to the existing DB. The default setting is **Set New**.

▶Forbidden Signatures

Forbidden Signature Database (DBX) contains forbidden certificates and digital signatures. Select Set New to load the DBX from the manufacturer's defaults. Select Append to add the DBX from the manufacturer's defaults to the existing DBX. The default setting is **Set New**.

▶Authorized TimeStamps

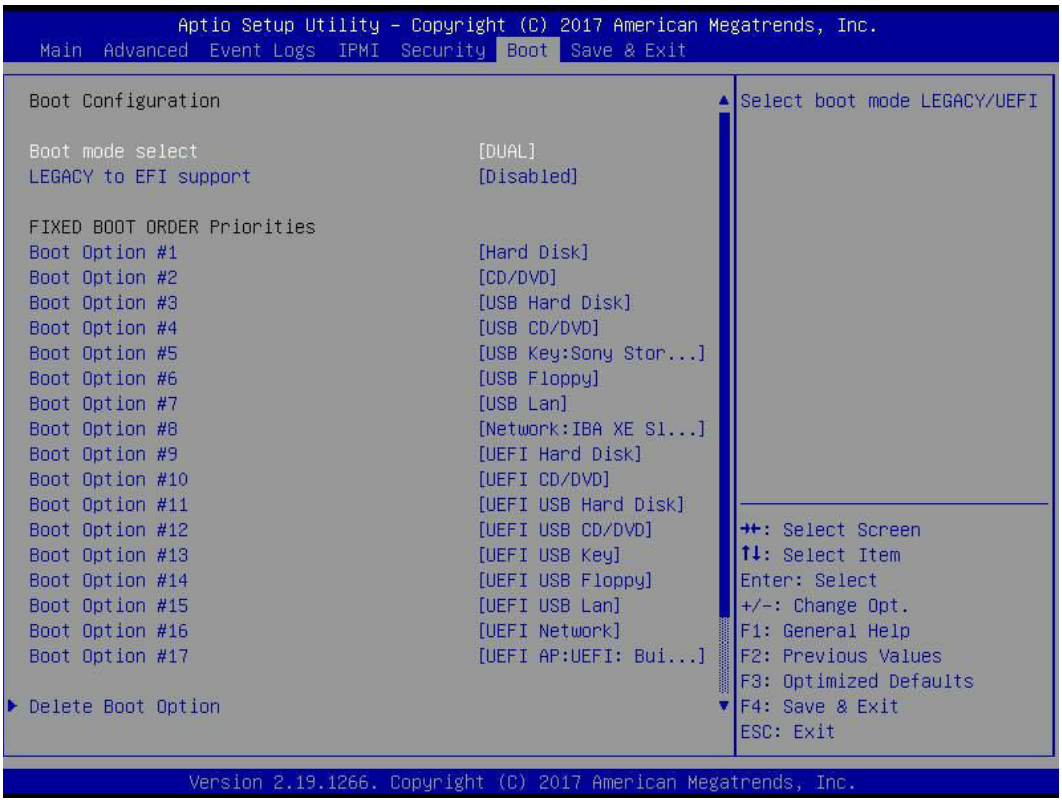
Select Set New to load the Authorized Timestamp Database (DBT) from the manufacturer's defaults. Select Append to add the DBT from the manufacturer's defaults list to the existing DBT. The default setting is **Set New**.

▶OsRecovery Signatures

Select Set New to load the OsRecovery Signatures Database (DBR) from the manufacturer's defaults. Select Append to add the DBR from the manufacturer's defaults list to the existing DBR. The default setting is **Set New**.

6.7 Boot

Use this tab page to configure Boot Settings.



Boot mode select

Use this item to select the type of device that the system is going to boot from. The options are LEGACY, UEFI, and **DUAL.** The default setting is **DUAL**.

LEGACY to EFI support

Use this item to enable the EFI boot support. The options are **Disabled** and Enabled.

FIXED BOOT ORDER Priorities

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

If the item above set to Legacy/UEFI/Dual, the following items will be displayed:

- Legacy/UEFI/Dual Boot Order #1
- Legacy/UEFI/Dual Boot Order #2
- Legacy/UEFI/Dual Boot Order #3
- Legacy/UEFI/Dual Boot Order #4
- Legacy/UEFI/Dual Boot Order #5

- Legacy/UEFI/Dual Boot Order #6
- Legacy/UEFI/Dual Boot Order #7
- Legacy/UEFI/Dual Boot Order #8
- UEFI/Dual Boot Order #9
- Dual Boot Order #10
- Dual Boot Order #11
- Dual Boot Order #12
- Dual Boot Order #13
- Dual Boot Order #14
- Dual Boot Order #15
- Dual Boot Order #16
- Dual Boot Order #17

▶Delete Boot Option

Use this feature to remove a pre-defined boot device from which the system will boot during startup. The options are **Select one to Delete** and UEFI: Built-in EFI Shell.

▶UEFI Application Boot Priorities

This feature allows the user to specify which UEFI devices are boot devices.

Boot Option #1

The options are **UEFI: Built-in EFI Shell** and Disabled.

▶Network Drive BBS Priorities

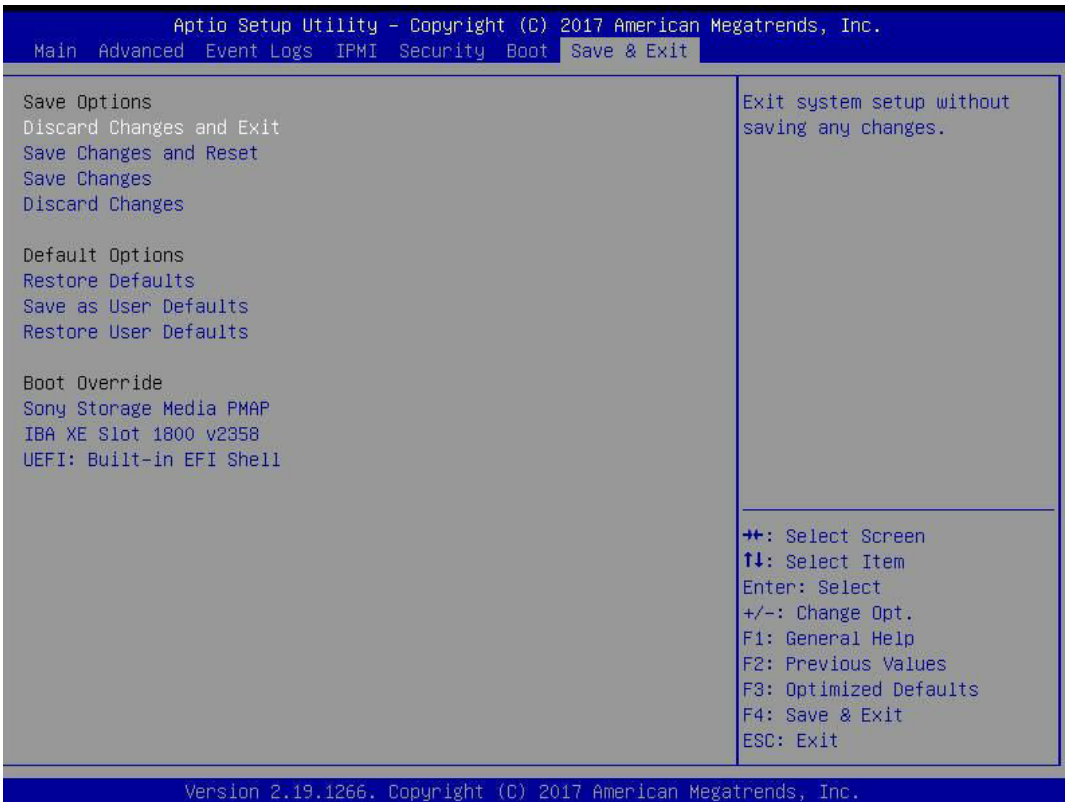
This feature allows the user to specify which available network drives are boot devices.

Boot Option #1

The options are **IBA XE Slot 1800 v2358** and Disabled.

6.8 Save & Exit

Use this tab page to configure Save & Exit settings.



Save Options

Discard Changes and Exit

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

Save Changes and Reset

After completing the system configuration changes, select this option to save the changes you have made. This will reset (reboot) the system.

Save Changes

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

Discard Changes

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

Listed on this section are other boot options for the system (i.e., Built-in EFI shell). Select an option and press <Enter>. Your system will boot to the selected boot option.

Default Options

Restore Defaults

To set this feature, select Restore Optimized Defaults from the Save & Exit menu and press <Enter>. These are factory settings designed for maximum system stability, but not for maximum performance.

Save As User Defaults

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

Restore User Defaults

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

Boot Override

Listed on this section are other boot options for the system (i.e., Built-in EFI shell). Select an option and press <Enter>. Your system will boot to the selected boot option.

Appendix A

BIOS Error Codes

A.1 BIOS Error Beep (POST) Codes

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

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

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

These fatal errors are usually communicated through a series of audible beeps. The table below lists some common errors and their corresponding beep codes encountered by users.

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

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.

Warning Definition



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

警告の定義

この警告サインは危険を意味します。

人身事故につながる可能性がありますので、いずれの機器でも動作させる前に、

電気回路に含まれる危険性に注意して、標準的な事故防止策に精通して下さい。

此警告符号代表危险。

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

此警告符號代表危險。

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

Warnung

WICHTIGE SICHERHEITSHINWEISE

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

BEWAHREN SIE DIESE HINWEISE GUT AUF.

INSTRUCCIONES IMPORTANTES DE SEGURIDAD

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

GUARDE ESTAS INSTRUCCIONES.

IMPORTANTES INFORMATIONS DE SÉCURITÉ

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

CONSERVEZ CES INFORMATIONS.

תקנון הצהרות אזהרה

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

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

ا كً ف حالة وٌكي أى تتسبب ف اصابة جسد ةٌ هذا الزهز عٌ خطز !تحذ زٌ .
قبل أى تعول على أي هعذات،كي على علن بالوخاطز ال ٱجوة عي الذوائز
الكهزبائ ةٍ
وكي على درا ةٌ بالووارسات البقائ ةٍ لو عٌ وقع أي حادث
استخذم رقن الب إٍى الو صٌص ف هًا ةٌ كل تحذ زٌ 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 معداث الحمايت مه الدوائرالقصيرة 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 electrische installatie. Controleer of het beveiligde aparaat niet groter gedimensioneerd is dan 250V, 20A.

Power Disconnection Warning

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



電源切断の警告

システムコンポーネントの取り付けまたは取り外しのために、シャーシー内部にアクセスするには、

システムの電源はすべてのソースから切断され、電源コードは電源モジュールから取り外す必要があります。

警告

在你打开机箱并安装或移除内部器件前,必须将系统完全断电,并移除电源线。

警告

在您打開機殼安裝或移除內部元件前，必須將系統完全斷電，並移除電源線。

Warnung

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

¡Advertencia!

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

Attention

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

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 فصم انتظاو من جميع مصادر انطاقت وإزانت سهك انكهرباء من وحدة امداد

انطاقت قبم

انصل إنى انمناطق انداخهيت نههيكم نتثبيج أو إزانت مكناث الجهاز

경고!

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

Waarschuwing

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

Equipment Installation



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

機器の設置

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

警告

只有经过培训且具有资格的人员才能进行此设备的安装、更换和维修。

警告

只有經過受訓且具資格人員才可安裝、更換與維修此設備。

Warnung

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

¡Advertencia!

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

Attention

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

אזהרה!

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

والمدربيه لتزكيب واستبدال أو خدمة هذا الجهاس 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

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

Warnung

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

¡Advertencia!

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

Attention

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

אזור עם גישה מוגבלת

אזהרה!

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

تخصيص هذه انحذة نترك بُها ف مناطق محظورة تم .
،مَكن انصبل إن منطقت محظورة فقط من خلال استخذاو أداة خاصت
أو أ وس هُت أخري نلالأمما قفم 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

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

警告

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

Warnung

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

Attention

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

¡Advertencia!

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

!אזהרה

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

هناك خطر من انفجار في حالة اسحبذال البطارية بطريقة غير صحيحة فعليل
اسحبذال البطارية
فقط بنفس النبع أو ما يعادلها مما أوصث به الشرمة المصنعة
جخلص من البطاريات المسحعملة وفقا لحعليمات الشرمة الصانعة

경고!

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

Waarschuwing

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

Redundant Power Supplies



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

冗長電源装置

このユニットは複数の電源装置が接続されている場合があります。

ユニットの電源を切るためには、すべての接続を取り外さなければなりません。

警告
此部件连接的电源可能不止一个，必须将所有电源断开才能停止给该部件供电。

警告
此裝置連接的電源可能不只一個，必須切斷所有電源才能停止對該裝置的供電。

Warnung

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

¡Advertencia!

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

Attention

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

אם קיים יותר מספק אחד

אזהרה!

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

قد يكون لهذا الجهاز عدة اتصالات بوحدات امداد الطاقة .

يجب إزالة كافة الاتصالات 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
当系统正在进行时，背板上有很危险的电压或能量，进行维修时务必小心。

警告
當系統正在進行時，背板上有危險的電壓或能量，進行維修時務必小心。

Warnung

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

¡Advertencia!

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

Attention

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

מתח בפנל האחורי

אזהרה!

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

هناك خطر مه التيار الكهزبائي أوالطاقة المجسدة على اللحة
عندما يكن النظام يعمل كه حذرا عند خدمة هذا الجهاس

경고!
시스템이 동작 중일 때 후면판 (Backplane)에는 위험한 전압이나 에너지가 발생 합니다. 서비스 작업 시 주의하십시오.

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

Comply with Local and National Electrical Codes



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

地方および国の電気規格に準拠

機器の取り付けはその地方および国の電気規格に準拠する必要があります。

警告
设备安装必须符合本地与本国电气法规。

警告
設備安裝必須符合本地與本國電氣法規。

Warnung
Die Installation der Geräte muss den Sicherheitsstandards entsprechen.

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

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

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

تركيب المعدات الكهربائية يجب أن يمتثل للقاويه 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 القانين واللائح البطنية عند

경고!

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

Waarschuwing

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

Hot Swap Fan Warning



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

ファン・ホットスワップの警告

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

警告!

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

警告

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

Warnung

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

¡Advertencia!

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

Attention

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

אזהרה!

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

تحذير! أجزاء متحركة خطرة. ابتعد عن شفرات المروحة المتحركة.من الممكن أن
المراوح لا تزال تدورعند 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. 섀시로부터 팬 조립품을 제거할 때 팬은 여전히 회전하고 있을 수 있습니다. 팬 조림품 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 cord) 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/CSA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 Adapater, 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 certifies- 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 ימאתמו סיילמשח סילבכ

!הרהזא

ךרוצל ומאתוה וא ושכרנ רשא AC סימאתמו סיקפס ,סילבכב שמתשהל שי ,רצומה תא סיניקתמ רשאכ לכב שומיש . עקתהו לבכה לש הנוכנ הדימ ללוכ ,תוימוקמה תוחיטבה תושירדל ומאתוה רשאו ,הנקתהה למשחה יריש כמב שומישה יקוחל סאתהב .ילמשח רצק וא הלקתל סורגל לולע ,רחא גוסמ סאתמ וא לבכ לש דוק סהילע עיפומ רשאכ) CSA-ב וא UL -ב סיכמסומה סילבכב שמתשהל רוסיא סייק ,תוחיטבה יקוחו .דבלב Supermicro י"ע סאתוה רשא רצומב קר אלא ,רחא ילמשח רצומ לכ רובע UL/CSA)

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

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 Intel Xeon Scalar Processor, Gen 1 & 2s in a P (LGA3647) type socket
Note: Please refer to the motherboard specifications pages on our website for updates to supported processors.

Chipset

Intel C621 chipset

BIOS

AMI 32Mb SPI Flash ROM

Memory

Twenty-four slots for up to 6 TB of 3DS Load Reduced DIMM (3DS LRDIMM), 3DS Registered DIMM (3DS RDIMM), or up to 3 TB of Load Reduced DIMM (LRDIMM) with speeds of up to 2933 MHz; support for Non-Volatile DIMM (NVDIMM) and Intel Optane DC Persistent Memory (DCPMM); DIMM size up to 256 GB at 1.2 V

Storage

Six hot-swap 2.5" bays for NVMe, SAS, or SATA
(*Optional*) Two internal SuperDOM

PCI Expansion Slots

Two full-height, double-width, PCIe slots (one x8, one x16), four full-height, full-width x8 PCIe slots, one low-profile x8 PCIe slot, one internal low-profile PCIe x8 slot (Ultra riser)

Motherboard

X11DPU-V; Length 17.0", width 16.8" (431.8 mm x 426.7 mm)

Chassis

SC-219ULTS-R1K62P; 2U Rackmount, (WxHxD) 17.2 x 3.5 x 22.6 in. (437 x 89 x 574 mm)

System Cooling

Six 6-cm, 9.5K RPM fans, two CPU heatsinks, two air shrouds to direct air flow

Weight

Net Weight: 39 lbs (17.7 kg)
Gross Weight: 63 lbs (28.6 kg)

Power Supply

Model: PWS-1K62A-1R, 1600/1000 W redundant modules, 80Plus Titanium level
Input:
100-127Vac / 13-9 A / 50-60 Hz
200-240Vac / 10-8 A / 50-60 Hz
+12V:
Max: 83.3 A / Min: 0 A (100-127 Vac)
Max: 133 A / Min: 0 A (200-240 Vac)
+12 V standby: Max: 2.1 A / Min: 0 A

Operating Environment

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

Regulatory Compliance

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

Applied Directives, Standards

for Models 219U-16, 219UL-R16X11, 219U-13
EMC/EMI: 2014/30/EU (EMC Directive)
FCC Part 15
ICES-003
VCCI 32-1
AS/NZS CISPR 32
EN55032
EN55035
EN 61000-3-2
EN 61000-3-3
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

Green Environment:
2011/65/EU (RoHS Directive)
EC 1907/2006 (REACH)
2012/19/EU (WEEE Directive)

Product Safety: 2014/35/EU (LVD Directive)
UL/CSA 62368-1 (USA and Canada)
IEC/EN 62368-1

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”

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. Also, you may use the Supermicro Update Manager (SUM) Out-of-Band (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.

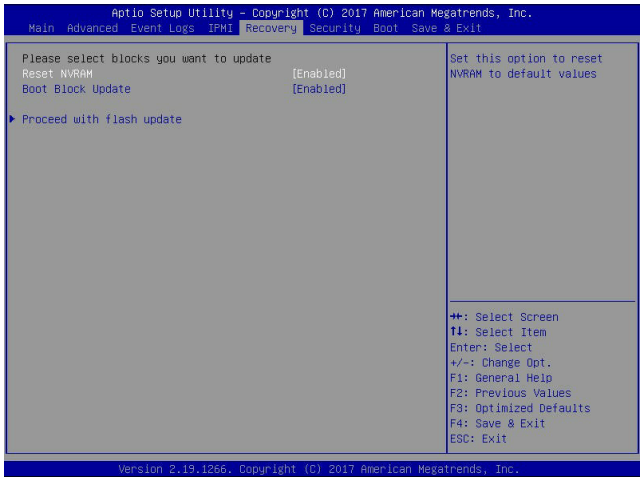
   Note 1: If you cannot locate the "Super.ROM" file in your drive disk, visit our website at www.supermicro.com to download the BIOS package. Extract the BIOS binary image into a USB flash device and rename it "Super.ROM" for the BIOS recovery use.

   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.



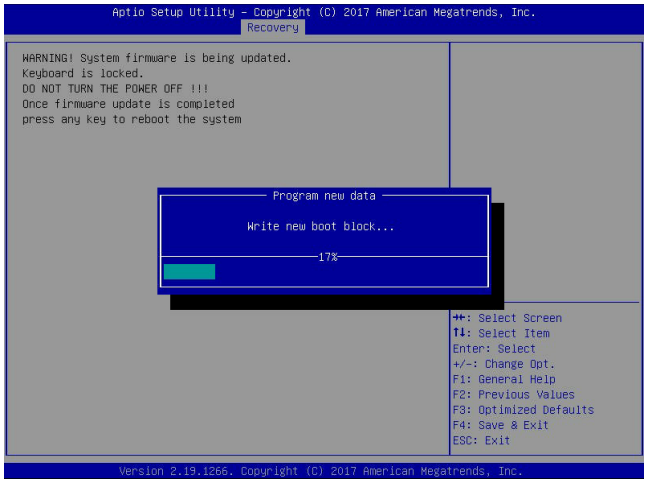
3. After locating the healthy BIOS binary image, the system will enter the BIOS Recovery menu as shown below.



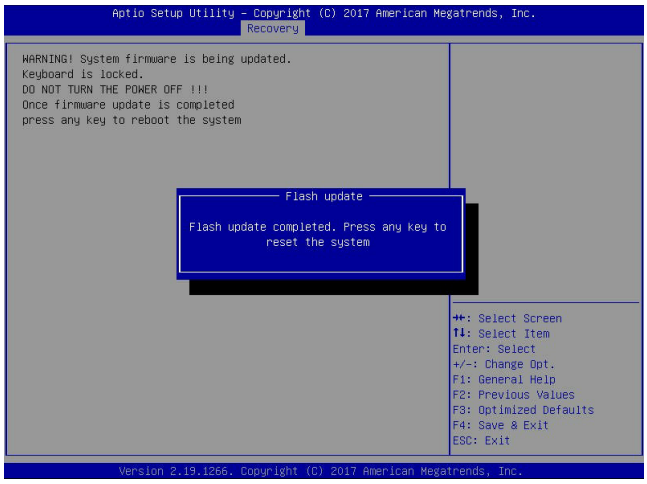
Note: At this point, you may decide if you want to start the BIOS recovery. If you decide to proceed with BIOS recovery, follow the procedures below.

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*.

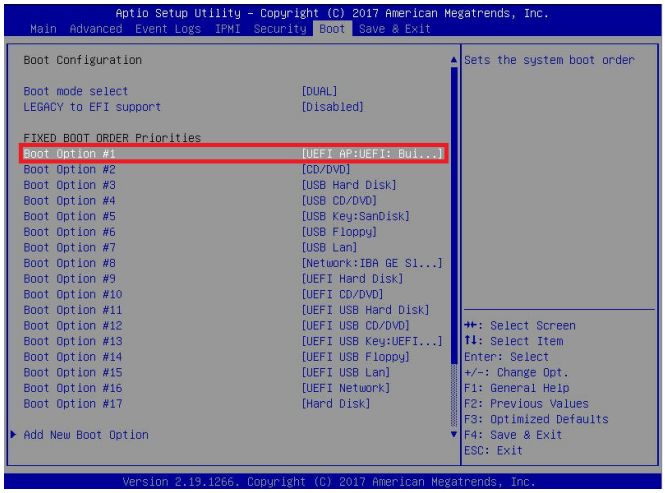


5. After the BIOS recovery process is complete, press any key to reboot the system.

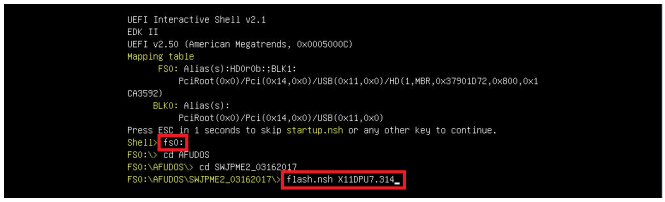


6. Using a different system, extract the BIOS package into a USB flash drive.

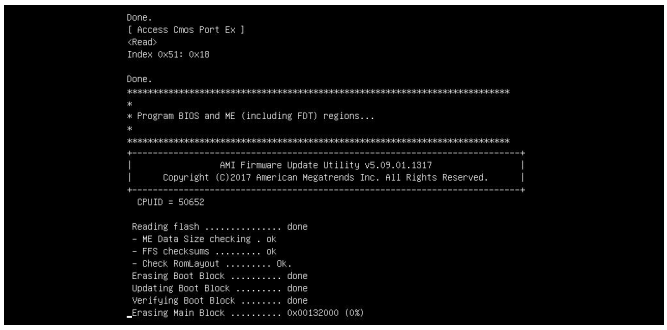
7. Press <Del> continuously during system boot to enter the BIOS Setup utility. From the top of the tool bar, select Boot to enter the submenu. From the submenu list, select Boot Option #1 as shown below. Then, set Boot Option #1 to [UEFI AP:UEFI: Built-in EFI Shell]. Press <F4> to save the settings and exit the BIOS Setup utility.



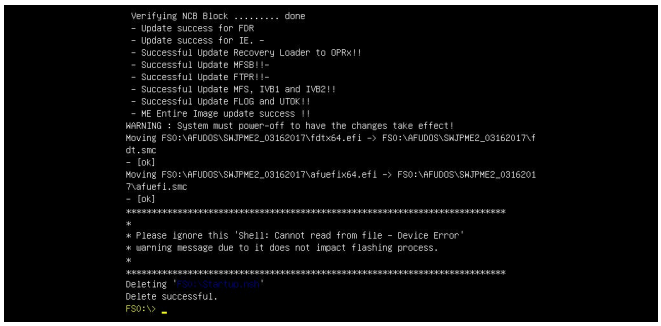
8. When the UEFI Shell prompt appears, type fs# to change the device directory path. Go to the directory that contains the BIOS package you extracted earlier from Step 6. Enter flash.nsh BIOSname.### at the prompt to start the BIOS update process.



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



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



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

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

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

Appendix E

IPMI Crash Dump

In the event of a processor internal error (IERR) that crashes your system, you may want to provide information to support staff. You can download a crash dump of status information using IPMI. The IPMI manual is available at https://www.supermicro.com/solutions/IPMI.cfm.

Check IPMI Error Log

1. Access the IPMI web interface.
2. Click the **Server Health** tab, then **Event Log** to verify an IERR error.

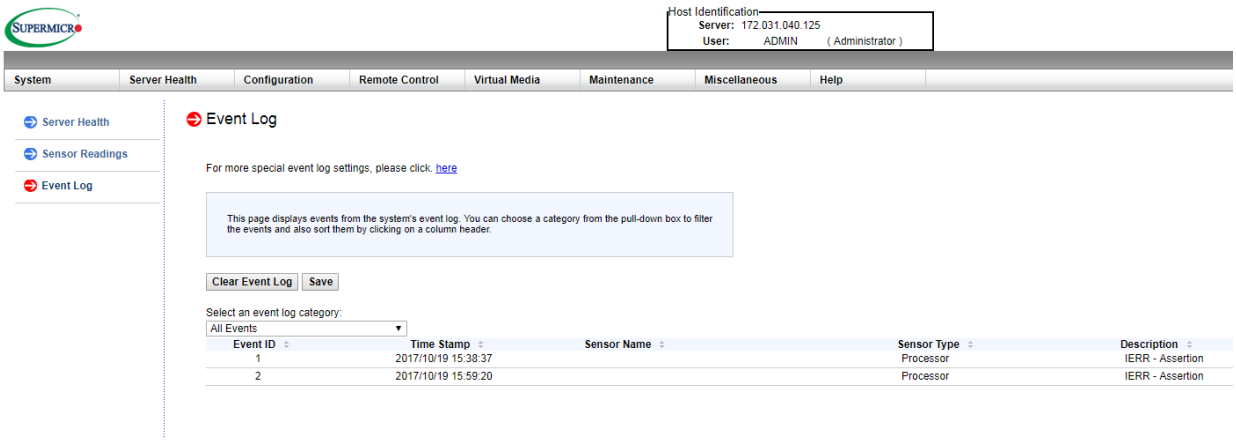


Figure E-1. IPMI Event Log

In the event of an IERR, the BMC executes a crash dump. You must download the crash dump and save it.

Downloading the Crash Dump File

1. In the IPMI interface, click the **Miscellaneous** tab, then the **Trouble Shooting** option.
2. Click the **Dump** button and wait five minutes for the file to be created. (No confirmation message will appear.)
3. Click the **Download** button and a Save As dialog appears.
4. Save the zipped dump file, noting the name and location.

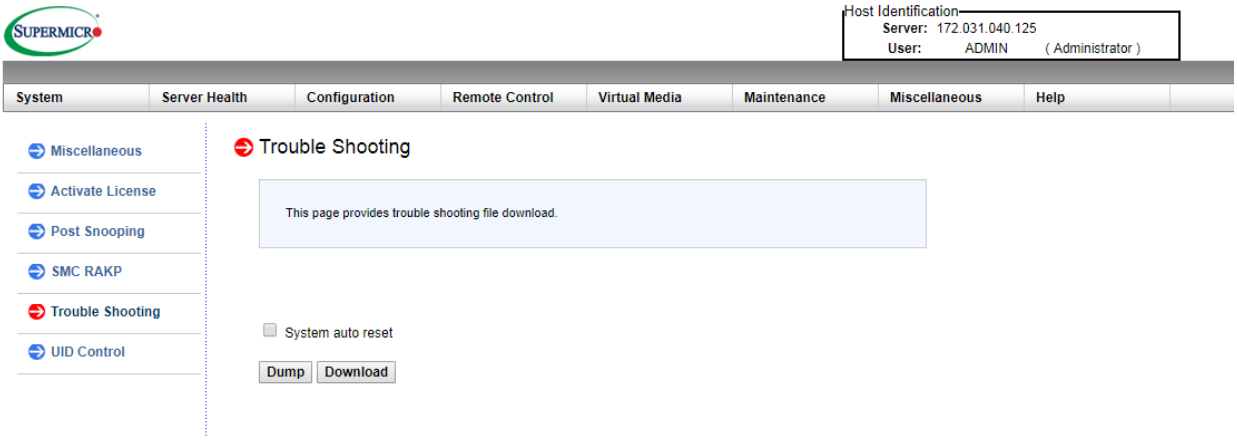


Figure E-2. IPMI Crash Dump Download

Note: The **System auto reset** check box dictates behavior after an IERR. If checked, the system will restart automatically, and the dump file will be erased. If not, the system remains in a failed state. Do not check this box until after the dump file has been sent to Support.

Appendix F

GPUs in 2U Ultra-E Systems

Supermicro 2U Ultra-E systems support graphic processing units (GPUs) when installed with some additional optional parts. The GPUs have cooling requirements that can be assisted by specialized dual-level air shrouds to direct the flow from the system fans.

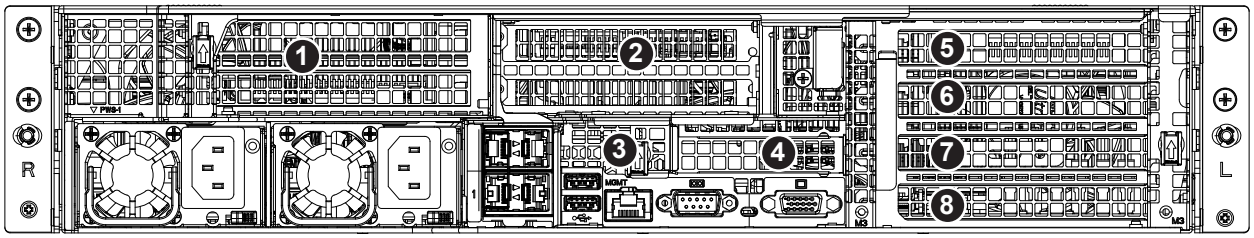


Figure F-1. Expansion Card Chassis Slots

In the diagram above, slots 1, 2, 5/6, and 7/8 can be used for double-width GPUs. Note that due to thermal limitations, a maximum of two GPUs should normally be installed. Positions 1 and 2 cannot be installed in the same system—the air shrouds are mutually exclusive. Position 7/8 should only be used after consultation with Supermicro.

Recommendation: If installing one double-width GPU, use slot 5; if installing two GPUs, use slots 1 and 5.

Four single-width low profile Tesla T4 GPU cards or four N3000-N Intel FPGA cards are supported with AOC- 2UR66-i4G and RSC-W2-66 risers.

Default Expansion Card Configurations			
Slot	**Mechanical**	**Electrical**	**In Models**
1	Double-width, full-height, full-length	x16 (CPU1)	All models
2	Double-width, full-height, full-length	x16 (CPU1) x8 (CPU1)	Depends on model
5/6	Full-height, full-length	x8 (CPU2)	All models
7/8*	Full-height, full-length	x8 (CPU2)	All models

*Only supported in special circumstances, in consultation with Supermicro

Optional Riser Cards

- **AOC-2UR66-i4G**: Slot 1 x16 (CPU1), Slot 2 x16 (CPU1), Slot 3 N/A
- **RSC-R2UW-2E8E16**: Slot 5 x16 (CPU2), Slot 7 x8 (CPU2), Slot 8 x8 (CPU2)
- **RSC-W2-66**: Slot 5 x16 (CPU2), Slot 7 x16 (CPU2)

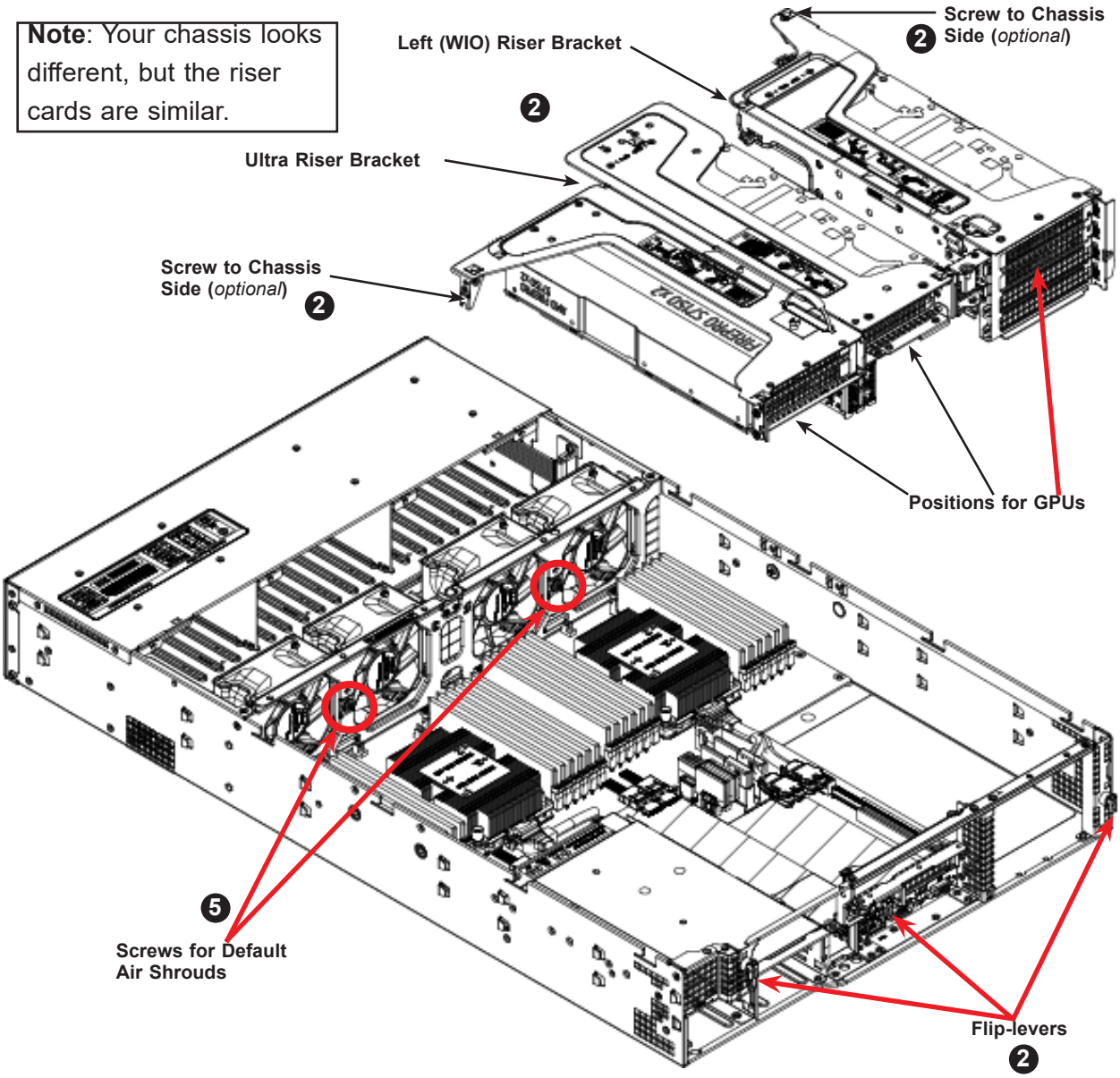


Figure F-2. Riser Cards and GPU Positions

Adding GPUs

1. Power down the system, unplug AC cords, and remove the top chassis cover.

2. Remove the appropriate riser card bracket, pictured above. On the rear of the chassis, each bracket is secured by a small black plastic flip-lever with an arrow on it. Flip open the appropriate lever to release the bracket, then pull the bracket out of the chassis. For the Ultra riser (center) bracket, there is a thumbscrew to a standoff in the chassis center.

3. Insert the GPU into the riser card slot while aligning the GPU rear L-shaped mounting bracket. Add screws to secure the GPU L-shaped mounting bracket.

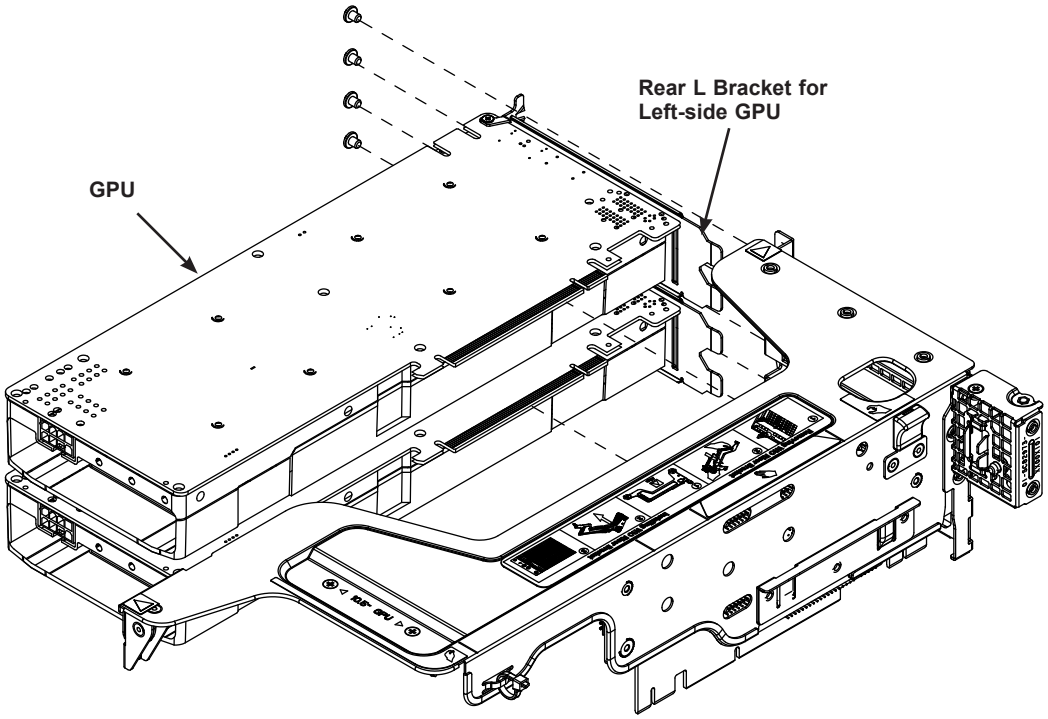


Figure F-3. Inserting the Left-side GPUs into the Riser Card Bracket

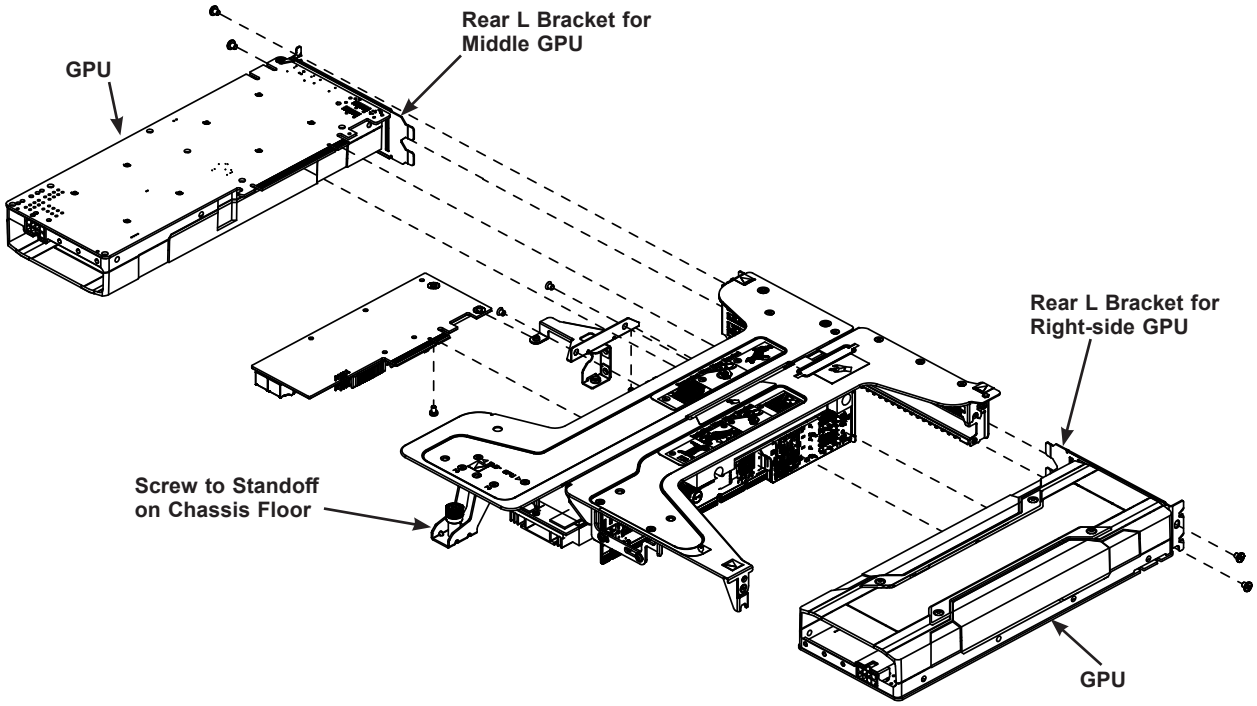


Figure F-4. Inserting the Middle and Right-side GPUs into the Riser Card Bracket

4. Secure the front end of the GPU to the bracket with screws. For one left-side GPU, a middle GPU, or a right-side GPU the front bracket is pre-installed on the riser card bracket.

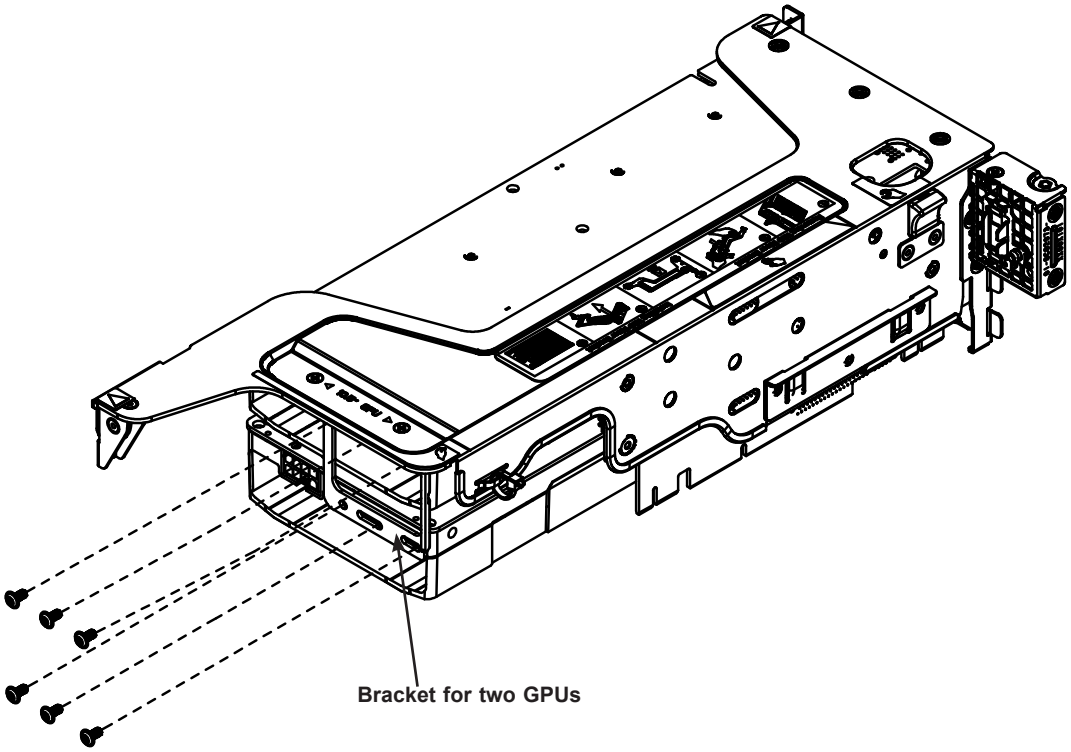


Figure F-5. Attaching the Front Bracket for the Left-side GPUs

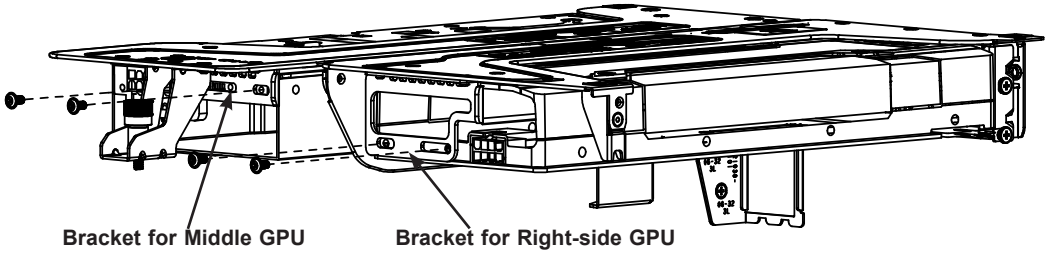


Figure F-6. Attaching the Front Bracket for Middle and Right-side GPUs

5. Remove the two screws on the fan housing that secure the default air shrouds. (See Figure F-2)
6. Place the appropriate air shroud (see the following notes). Insert the shroud tabs into the slot at the top of the fan housing.
7. Place the riser card bracket with GPU into the chassis. First, insert the cables and front end of the GPU into the throat of the air shroud. Then align and insert the riser card into the motherboard slot while aligning the bracket into the chassis.
8. Secure the bracket into the chassis. At the chassis rear, flip the small black plastic flip-lever to secure it. For the Ultra riser (center) bracket, use the thumbscrew to secure the bracket to the standoff in the chassis center. For either bracket, an optional screw can secure it to the chassis side.
9. Route the GPU power cable and plug it into the motherboard.
10. Close and power up the system.

Notes for Installing in the Upper Left-side Position (5/6)

- Break off the necessary portions of the shroud to allow for cables. In particular, remove some tabs on the top, as indicated.
- Position the shroud as shown in Figure F-3. The right wall of the shroud just covers CPU2.
- **Routing the GPU power cables:** Guide the cables up between the GPU and the shroud, then over the top of the shroud and down to the GPU_PWR3 or GPU_PWR4 connector on the motherboard. Make cables flat as possible. It is normal for the shroud to bend slightly under the cables.

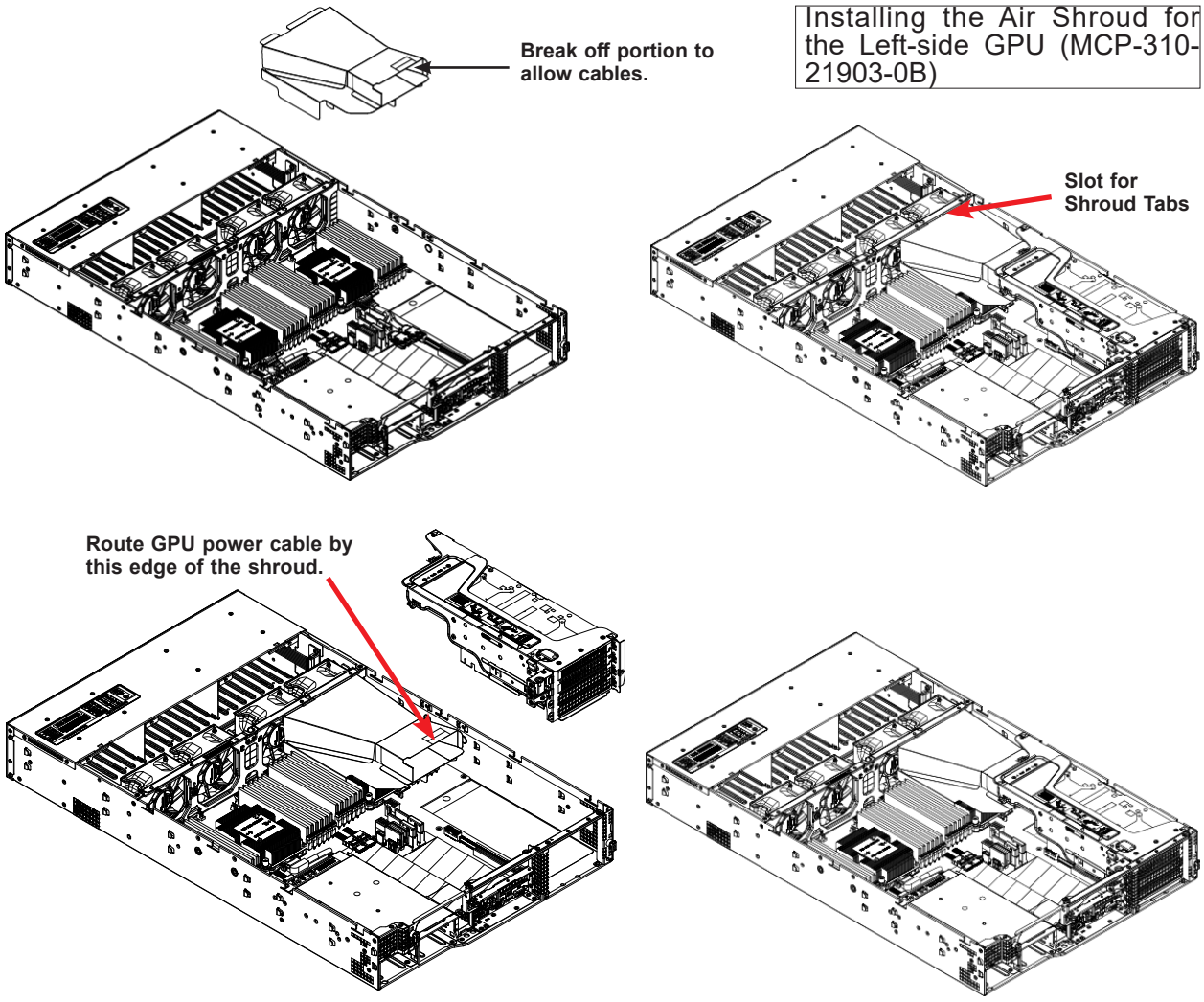


Figure F-7. Installing a GPU on the Upper Left-side

Notes for Installing in the Lower Left-side Position (7/8)

Installation of a GPU in the 7/8 position is not supported without consultation with Supermicro due to thermal limitations. If the 7/8 position is used, mounting requires MCP-120-82904-0N bracket from accessory box.

Notes for Installing in the Middle Position (2)

- Break off the necessary portions of the shroud to allow for cables. In particular, remove the top row of the shroud "ramp" as labeled below.
- Position the shroud as shown. The right side wall of the shroud should not cover the right-most DIMM (P1-DIMMC1). The hole near the center of the shroud fits over the standoff in the center of the chassis. The left wall of the shroud fits next to CPU2.
- **Routing the GPU power cables:** You will likely have to route the cables to the motherboard connector before fully seating the riser bracket. Guide the cables to the right between the GPU and the shroud and down to the GPU_PWR1 connector on the motherboard.

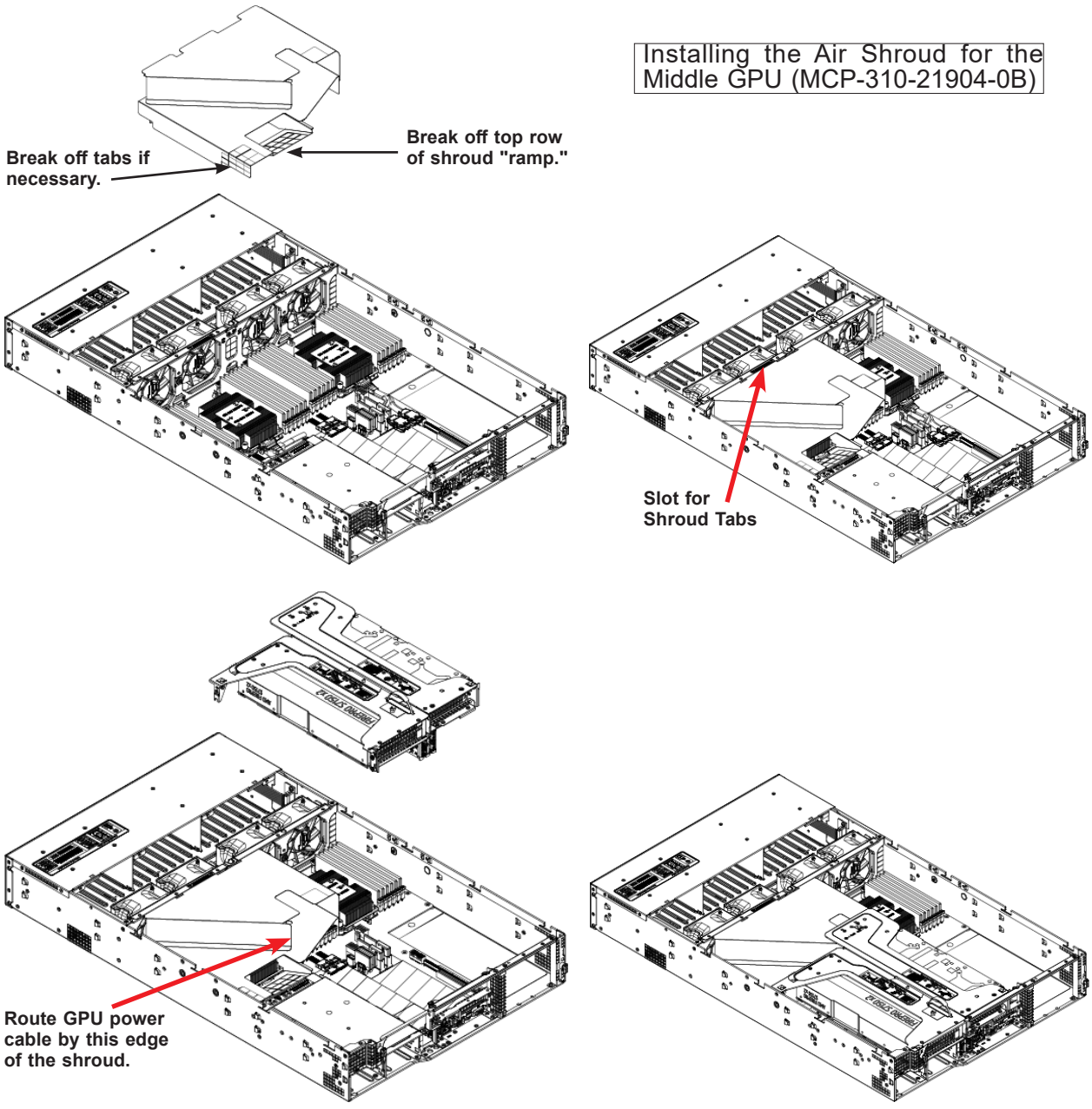


Figure F-8. Installing a GPU in the Middle of the Chassis

Notes for Installing in the Right-side Position (1)

- Break off the necessary portions of the shroud to allow for cables.
- Position the shroud as shown. The right side wall of the shroud should not cover the right-most DIMM (P1-DIMMC1). The hole near the center of the shroud fits over the standoff in the center of the chassis. The left wall of the shroud fits next to CPU2.
- **Routing the GPU power cables:** Connect the cable to GPU_PWR1 on the motherboard before placing the riser bracket and GPU into the chassis. Guide the cables to the left between the GPU and the shroud.

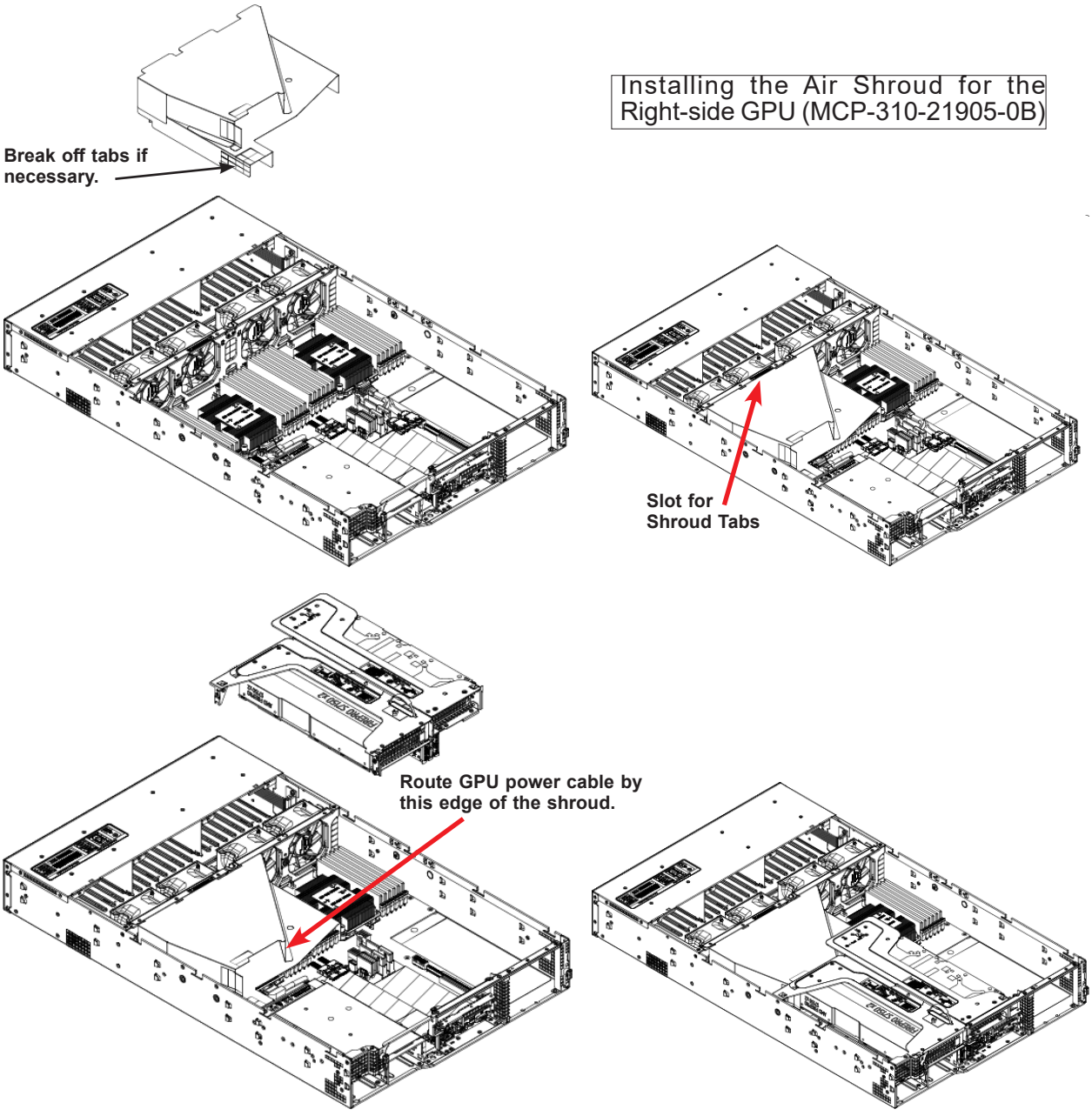


Figure F-9. Installing a GPU on the Right-side

Appendix G

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 PCIe 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 to due to performance issues, even though it is supported.

Supported SSDs and Operating Sytems

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

G.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

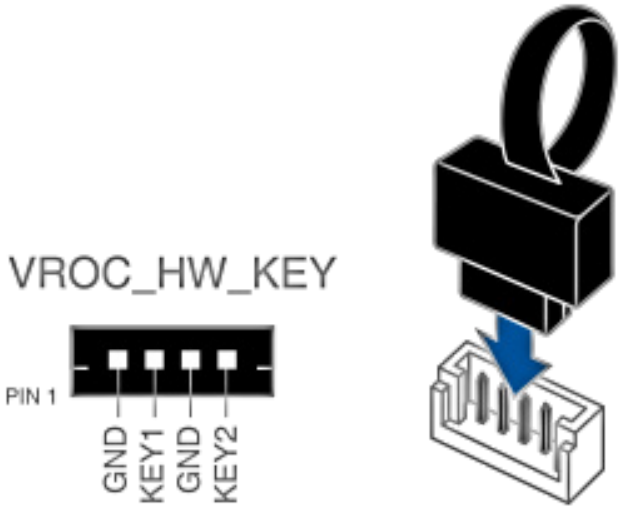


Figure G-1. Intel® VROC RAID Key and Motherboard Connector JRK1

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

   Examples for some U.2 configurations follow.

For 2029U-TN24R4T populated with 24 U.2 NVMe drives:

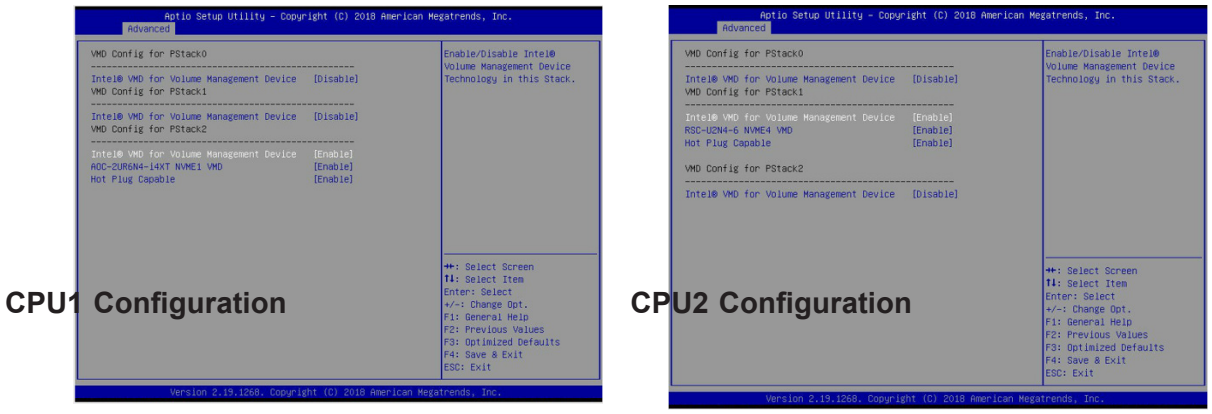


Figure H-2. BIOS VMD Setting Examples for Ultra Servers

6. Press [F4] to save the configuration and reboot the system.
7. Press [DEL] to enter BIOS.
8. Switch to **Advanced > Intel(R) 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 G-4.

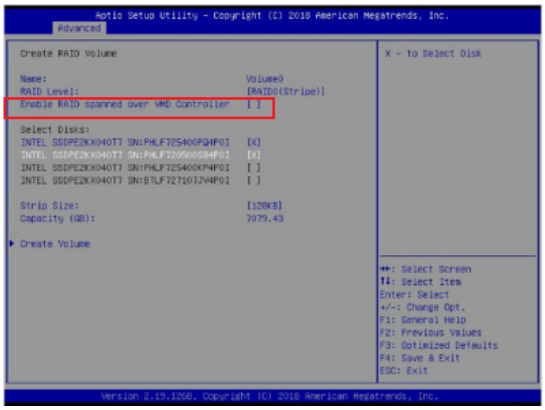


Figure G-3. Created Volume *without* enabling RAID spanned over VMD controller

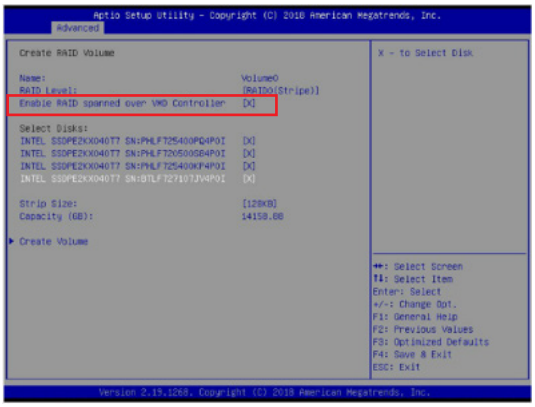


Figure G-4. Created Volume *with* enabling RAID spanned over VMD controller

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.

G.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

G.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