



# SuperServer®

## 220BT-DNTR

## 220BT-DNC8R



USER'S MANUAL

Revision 1.0

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# Preface

## About this Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the server. Installation and maintenance should be performed by experienced technicians only.

Please refer to the 220BT-D Series server specifications page on our website for updates on supported memory, processors and operating systems (<http://www.supermicro.com>).

## Notes

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

- Supermicro product manuals: <http://www.supermicro.com/support/manuals/>
- Product drivers and utilities: <https://www.supermicro.com/wdl>
- Product safety info: [http://www.supermicro.com/about/policies/safety\\_information.cfm](http://www.supermicro.com/about/policies/safety_information.cfm)

If you have any questions, please contact our support team at:  
[support@supermicro.com](mailto:support@supermicro.com)

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

## 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/](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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***Appendix C CPU-Based RAID for NVMe***

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# Chapter 1

## Introduction

### 1.1 Overview

This chapter provides a brief outline of the functions and features of the SuperServer 220BT-D Series. It is based on the X12DPT-B6 motherboard and the CSE-217BD-R2K22P chassis.

The following provides an overview of the specifications and capabilities.

System Overview	
<b>Motherboard</b>	X12DPT-B6
<b>Chassis</b>	CSE-217BD-R2K22P
<b>Processor Support</b>	Supports dual Intel Xeon Scalable Family 3rd Gen/4th Gen Series Processors (in Socket P+) with a thermal design power (TDP) of up to 270W and three UPIs (UltraPath Interconnect) of up to 11.2 GT/s per node.
<b>Chipset</b>	Intel PCH C621A (LBG-R)
<b>Memory</b>	16 DRAM DIMMs plus two PMem (Intel® Optane™ PMem 200 Series) per node. Up to 4TB RDIMM, DDR4-3200MHz in 16 memory slots
<b>Drive Support</b>	Front hot-swappable drives include: 24 NVMe/SATA drives for 220BT-DNTR 24 NVMe/SAS/SATA drives for 220BT-DNC8R Internal M.2 drives per node include: Default carrier with two M.2 NVMe/SATA SSDs Optional carrier with two M.2 NVMe SSDs and Marvell HW RAID Internal Connector: VROC key header
<b>Expansion Slots</b>	Two PCIe 4.0 x8 slots and one PCIe 4.0 x16 for each node
<b>Networking</b>	One AIOM or any compliant OCP 3.0 SFF Network Interface Card per node One dedicated LAN port for BMC per node
<b>I/O Ports</b>	Two USB 3.0 ports per node One VGA port per node
<b>System Cooling</b>	Four 8-cm mid-chassis fans Two CPU heatsinks per node One air shroud per node
<b>Power</b>	Redundant 2200W modules, 80Plus level Titanium
<b>Form Factor</b>	2U rackmount; (WxHxD) 17.6 x 3.5 x 28.8 in. (447 x 88 x 730 mm)

**Notes:** A Quick Reference Guide can be found on the product page of the Supermicro website. The following safety models associated with the 220BT-D Series have been certified as compliant with CSA or UL models: 217B-22 and 217B-R22X12.

## 1.2 System Features

The CSE-217BD-R2K22P is a 2U chassis that supports 24 front hot-swappable drives and two rear hot-pluggable nodes.

### Front View

The chassis front offers access to the storage drives, a control panel for each node, a pull-out service tag and two thumbscrews.

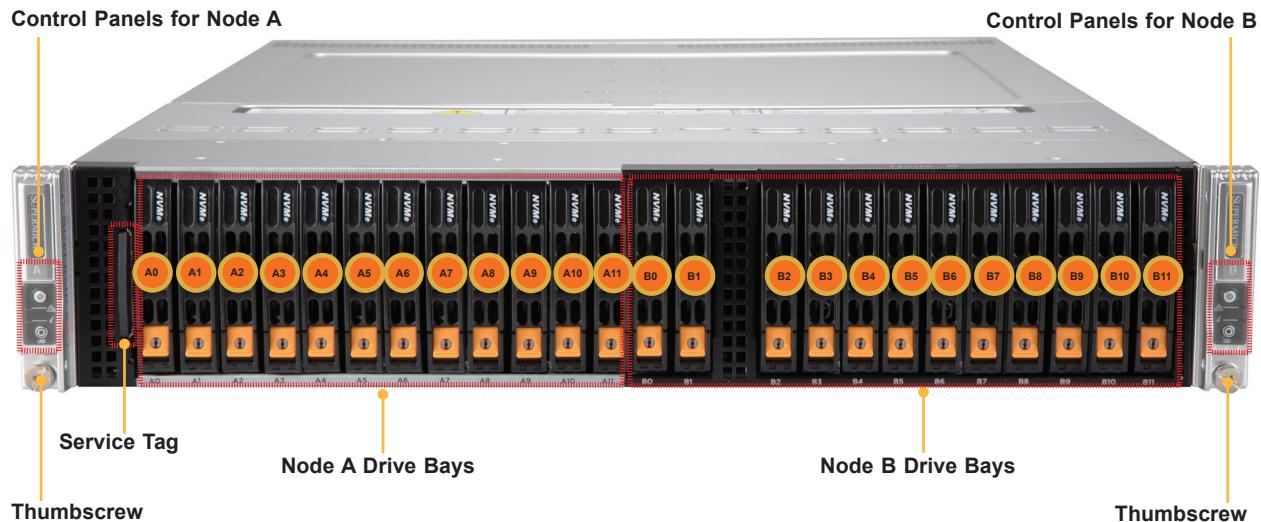


Figure 1-1. Front View

System Features: Front	
Feature	Description
Control Panels	Two control panels with labels for each node
Service Tag	Pull-out service tag with BMC password label
Drive Bays	24 hot-swappable drive bays (12 per node)
Thumbscrews	Two thumbscrews to secure the server onto the rack

## Control Panel

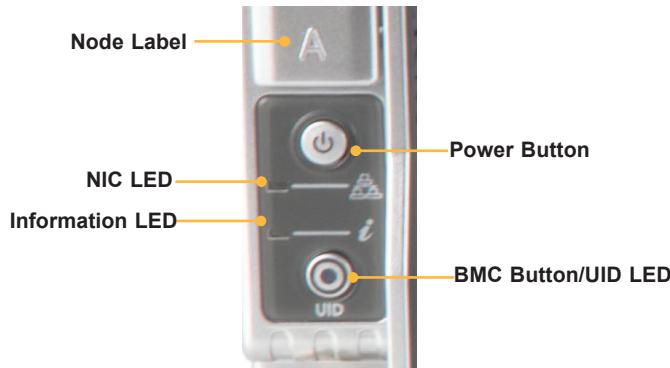


Figure 1-2. Control Panel

Control Panel Features	
Feature	Description
Node Label	Label with the name of the node that is connected to the control panel.
Power Button	The main power switch applies or removes primary power from the power supply to the server but maintains standby power.
NIC LED	Indicates network activity on the LAN when flashing.
Information LED	Universal information LED (see table below for details).
BMC Button/UID LED	The BMC reset button resets the BMC firmware when pressed. The unit identification (UID) button turns on or off the blue light function of the Information LED and a blue LED on the rear of the chassis. These are used to locate the server in large racks and server banks.

Information LED	
Status	Description
Continuously on and red	An overheat condition has occurred.
Blinking red (1Hz)	Fan failure, check for an inoperative fan.
Blinking red (0.25Hz)	Power failure, check for a non-operational power supply.
Solid blue	Local UID has been activated. Use this function to locate the server in a rackmount environment.
Blinking blue	Remote UID is on. Use this function to identify the server from a remote location.

## Rear View

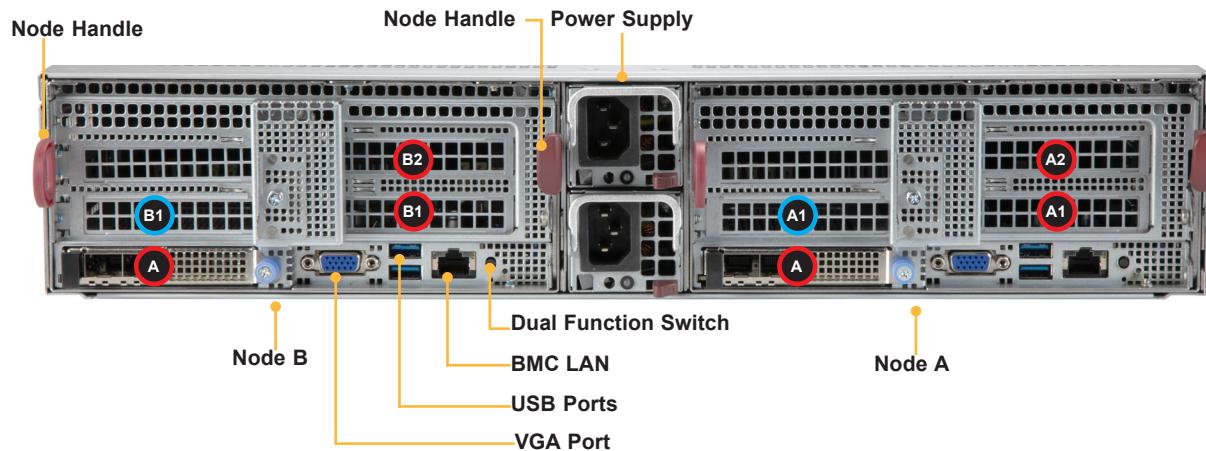


Figure 1-3. System: Rear View

System Features: Rear	
Feature	Description
Nodes A and B	Independent computing nodes
Power Supplies	Two 2200W redundant power supplies
VGA Port	Video port
USB Ports	Two USB 3.0 ports
LAN Port	Dedicated BMC LAN port
Dual Function Switch	A switch that can function as either a UID LED switch or a BMC reset switch. See Chapter 4 for a description of the dual function switch.
Node Handles	Two handles per node supporting node tray removal

Expansion Slot Locations	
Item	Description
1	PCIe 4.0 x8 Low Profile slot1 (CPU1) in each node
2	PCIe 4.0 x8 Low Profile slot2 (CPU1) in each node
1	PCIe 4.0 x16 slot (CPU2) in each node
A	AIOM PCIe 4.0 x16 slot (CPU1) in each node

CPU1 CPU2

## AIOM Network Ports

Network ports are provided by the AIOM card, which offers several choices of connection speeds and types.

AIOM Networking Add-on Card Options		
Speed	Ports	Add-on Card Part Number
GbE	Two RJ45	AOC-AG-i2M
	Four RJ45	AOC-AG-i4M
	Four SFP	AOC-AG-i4SM
10 G SFP+	Two SFP+	AOC-ATG-i2SM
	Four SFP+	AOC-ATG-i4SM
	Two SFP+ & two RJ45	AOC-ATG-i2T2SM
10GBase-T	Two RJ45	AOC-ATG-i2TM
25 GbE	Two SFP28 & two RJ45	AOC-AH25G-m2S2TM
	One SFP28	MCX623432AC-ADAB
	Two SFP28	MCX4621A-ACAB
100 GbE	QSFP56	MCX623435AC-VDAB

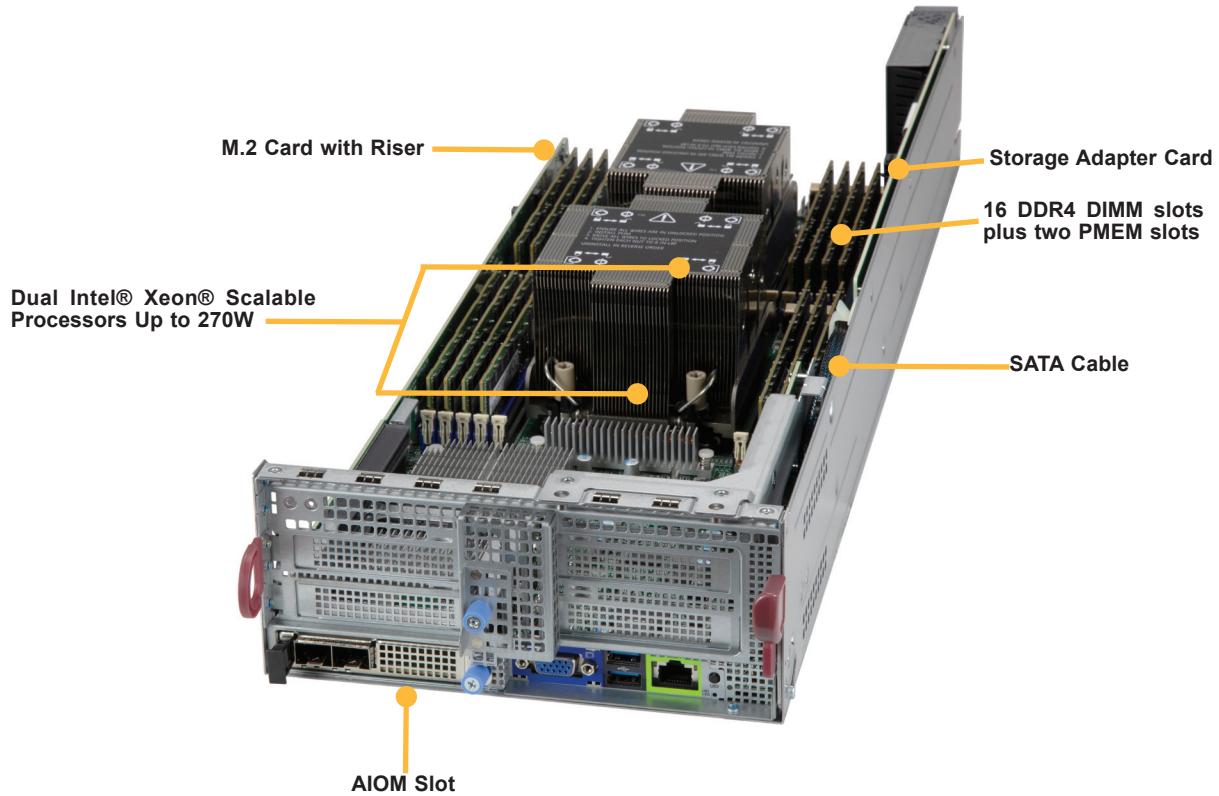
Updates: <https://www.supermicro.com/en/support/resources/aoc/aiom>

## Power Supply Options

Power Supply Module Options		
Watts	Part Number	80Plus Level
2200	PWS-2K22A-1R	Titanium

### Node Trays

The chassis contains two separate computing node drawers, each with its own motherboard.



**Figure 1-4. 220BT-DNTR Node Tray**

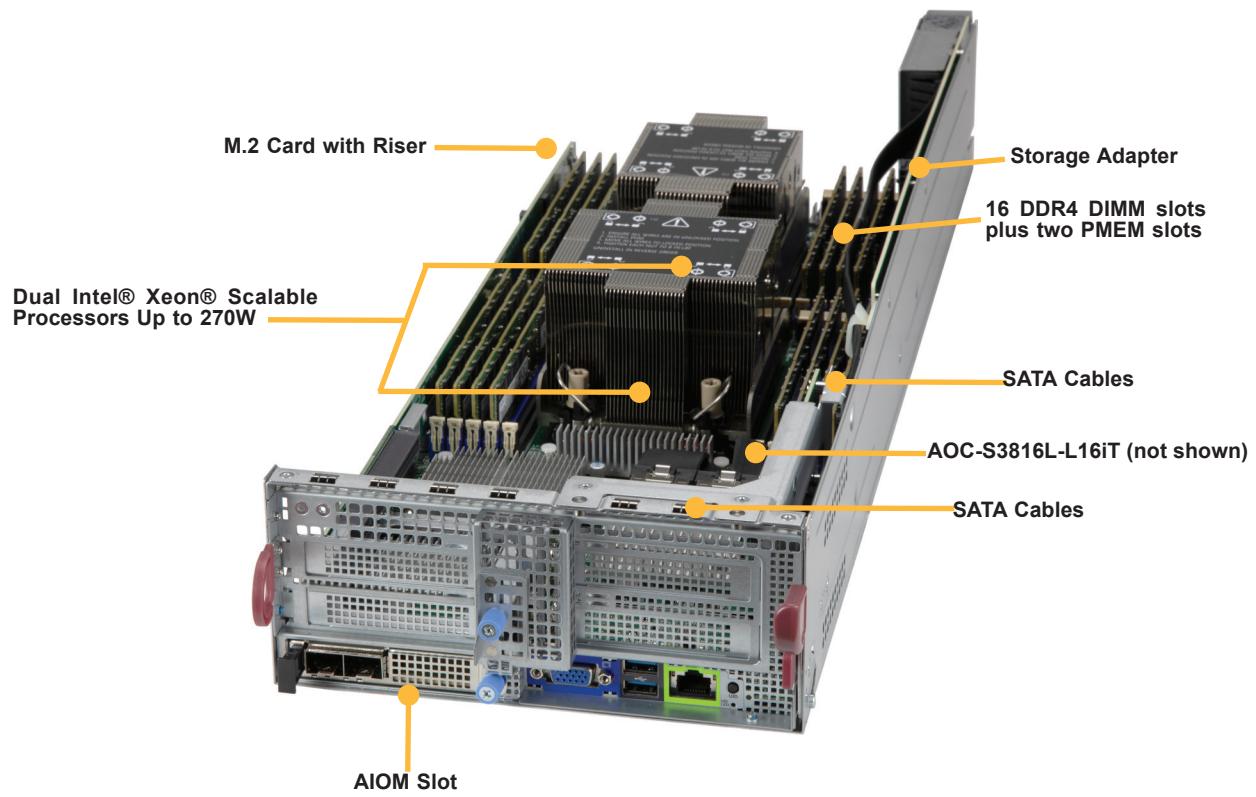


Figure 1-5. 220BT-DNC8R Node Tray

## 1.3 System Architecture

This section covers the printed circuit board (PCB) locations and the system block diagrams.

### Main Components

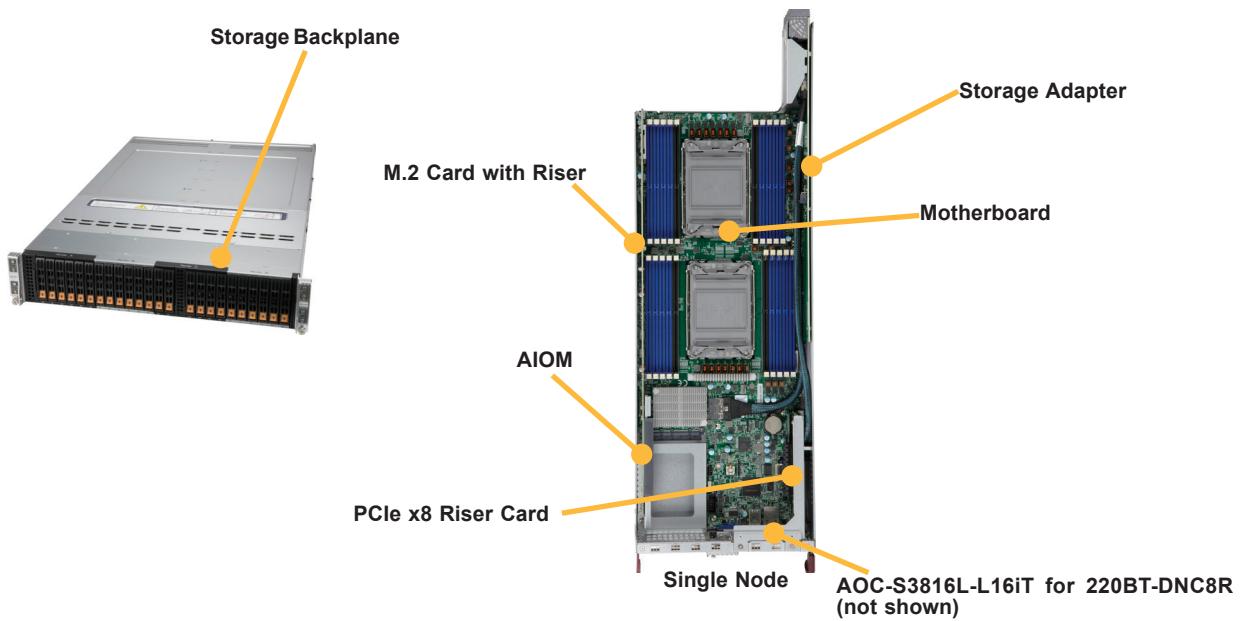


Figure 1-6. Main Component Locations

## System Block Diagram

The block diagram below shows the connections and relationships between the subsystems and major components of the overall system.

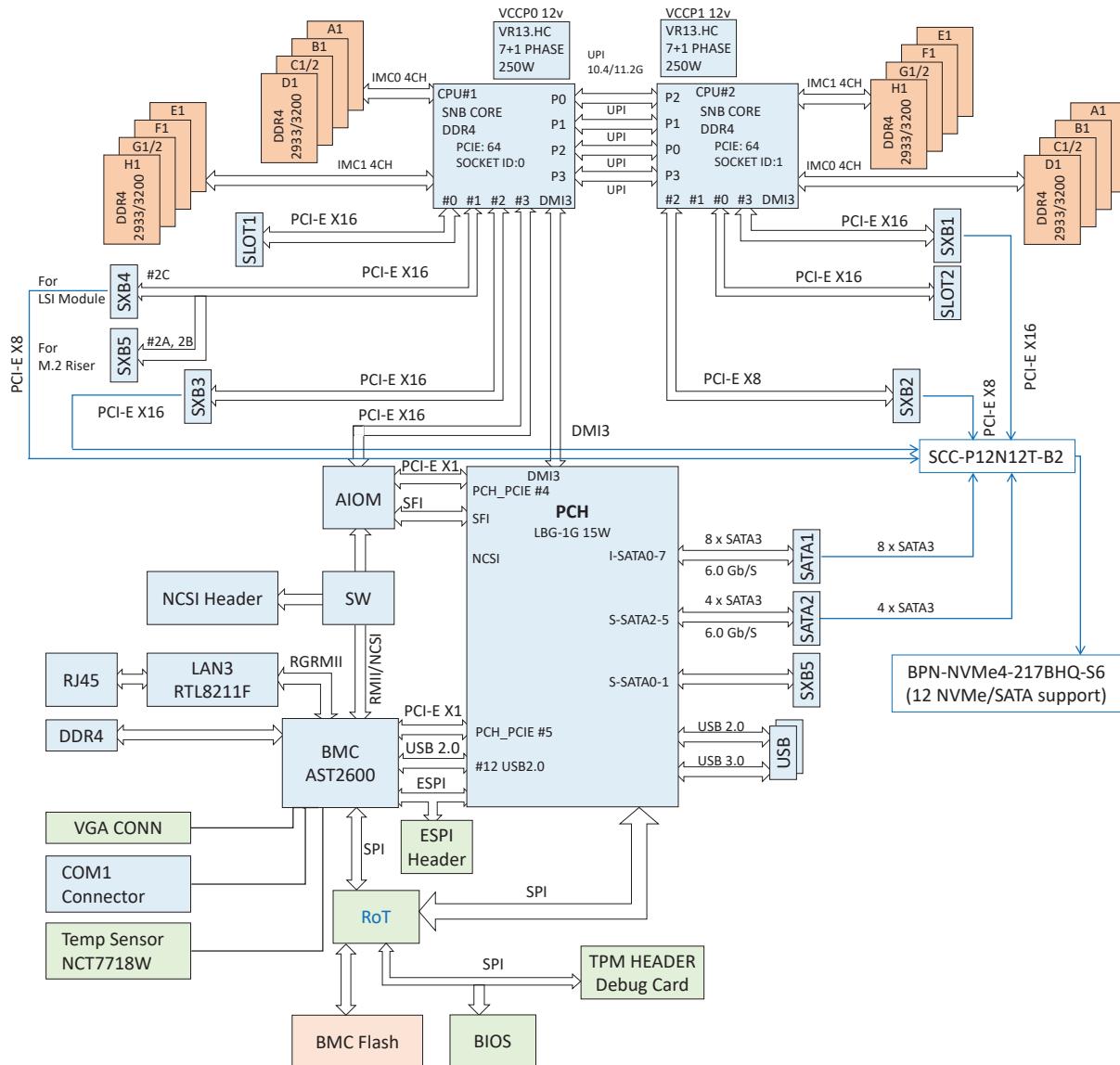
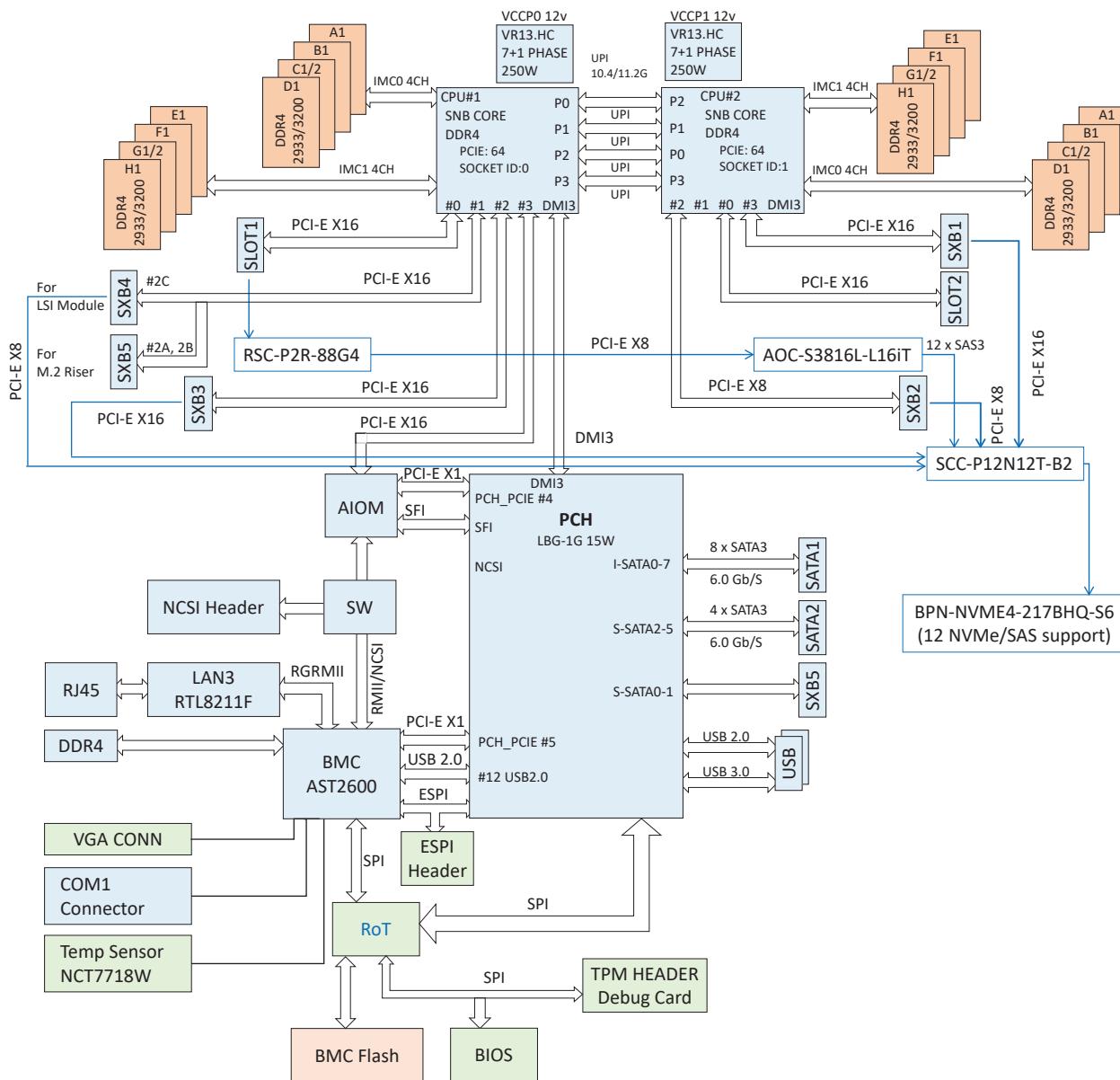


Figure 1-7. 220BT-DNTR System Block Diagram



**Figure 1-8. 220BT-DNC8R System Block Diagram**

## 1.4 Motherboard Layout

Below is a layout of the X12DPT-B6 motherboard 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](#) or the [Motherboard Manual](#).

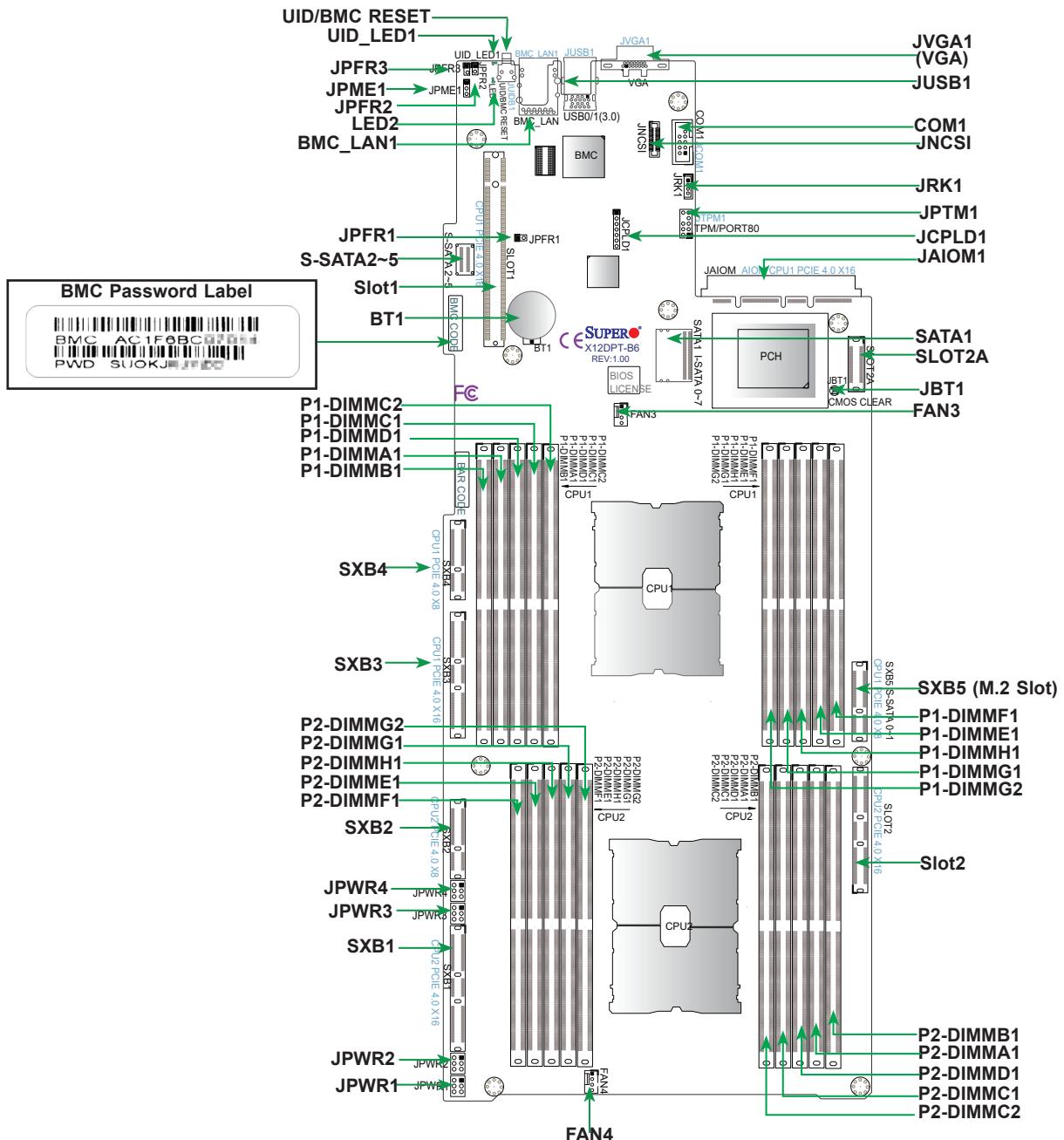


Figure 1-9. Motherboard Layout

## Quick Reference Table

Jumper	Description	Default Setting
JBT1	CMOS Clear	Open (Normal)
JPME1	ME Manufacturing Recovery	Pins 1-2 (Normal)
LED	Description	Status
UID_LED1	Unit Identifier (UID) LED	Solid Blue: Unit Identified
LED2	BMC Heartbeat LED	Blinking Green: BMC Normal Solid Green: (during BMC Reset or a Cold Reboot)
Connector	Description	
BT1	Onboard battery	
COM1	I/O COM port	
FAN3, FAN4	CPU/System fan headers (FAN1 & FAN2 in the HDD backplane)	
BMC_LAN1	Dedicated BMC LAN port	
I-SATA 0~7 (SATA1)	Intel® PCH SATA 3.0 ports (with RAID 0, 1, 5, 10)	
S-SATA 0~1, S-SATA 2~5	S-SATA 3.0 connectors supported by the Intel PCH	
JNCSI	NC-SI (Network Controller Sideband Interface) connector (See Note 1 below)	
JPWR1/JPWR2/JPWR3/JPWR4	6-pin power connectors	
JRK1 (RAID_KEY)	Intel VROC key header for NVMe RAID (See Note 2 below)	
JAION	AIOM (CPU1 PCIe 4.0x16) networking slot	
JTPM1	Trusted Platform Module/Port 80 connector	
JVGA1	VGA port	
SLOT1	PCIe 4.0 x16 slot (right hand riser) supported by CPU1	
SLOT2	PCIe 4.0 x16 slot (left hand riser, via cable) supported by CPU2	
SXB1	PCIe 4.0 x16 slot supported by CPU2	
SXB2	PCIe 4.0 x8 slot supported by CPU2	
SXB3	PCIe 4.0 x16 slot supported by CPU1	
SXB4	PCIe 4.0 x8 slot supported by CPU1 for SMCI-proprietary storage devices	
SXB5 (S~SATA0~1)	PCIe 4.0 x8 slot supported by CPU1 for dual hybrid M.2	
UID/BMC RESET (JUIDB1)	Unit Identifier (UID) & BMC Reset switch	
USB0/1 (3.0)	Two USB 3.0 connectors	

**Note 1:** For detailed instructions on how to configure Network Interface Card (NIC) settings, please refer to the Network Interface Card Configuration User's Guide posted on the web page under the link: <http://www.supermicro.com/support/manuals/>.

**Note 2:** For detailed instructions on how to configure VROC RAID settings, please refer to the VROC RAID Configuration User's Guide posted on the web page under the link: <http://www.supermicro.com/support/manuals/>.

## Motherboard Block Diagram

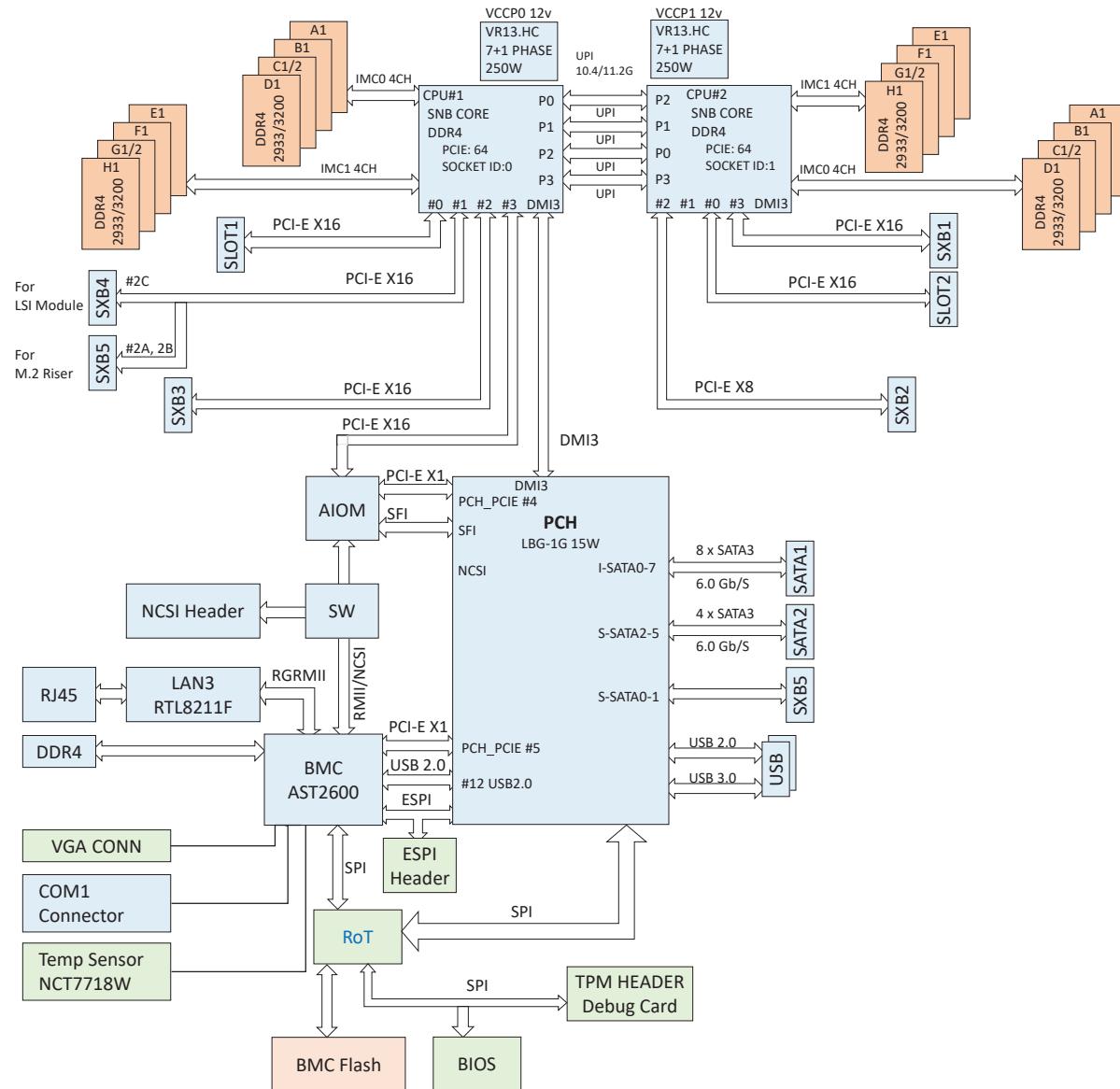


Figure 1-10. Motherboard Block Diagram

# 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 3](#) 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 Unpacking the System

Inspect the box in which the SuperServer 220BT-D Series was shipped, and note if it was damaged in any way. If any equipment appears damaged, 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 A](#).

### 2.3 Preparing for Setup

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

#### Choosing a Setup Location

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

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

## Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are extended to the floor so that the full weight of the rack rests on them.
- In single rack installations, stabilizers should be attached to the rack. In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a server or other component from the rack.
- You should extend only one server or component at a time - extending two or more simultaneously may cause the rack to become unstable.

## Server Precautions

- Review the electrical and general safety precautions in [Appendix A](#).
- 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.
- To maintain proper cooling, always keep all chassis panels closed and all SATA carriers installed when not being serviced.

## 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.



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- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
- Slide rail mounted equipment is not to be used as a shelf or a work space.



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



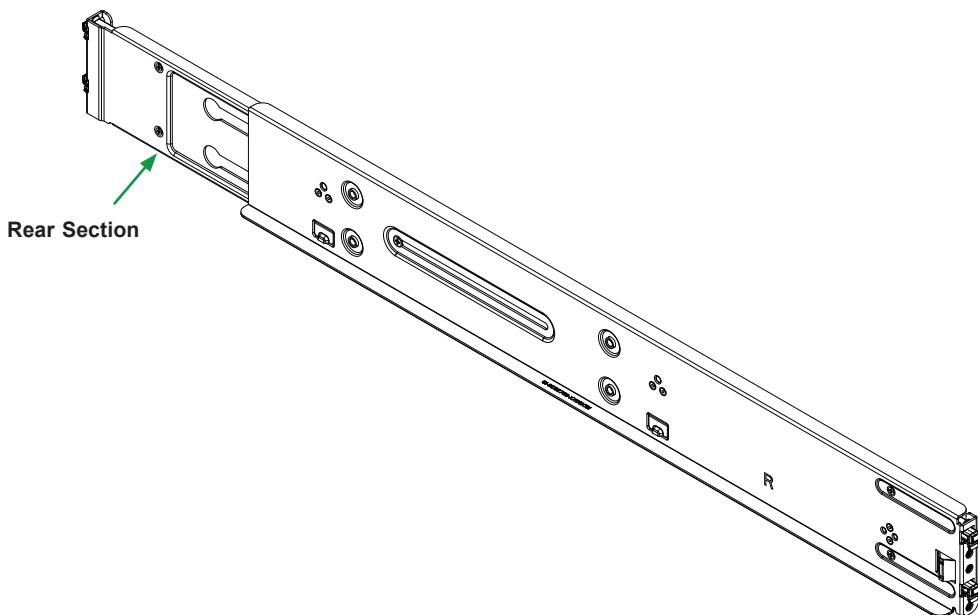
Slide rail mounted equipment is not to be used as a shelf or a work space.

## 2.3 Rack Mounting Instructions

This section provides information on installing the chassis into a rack unit with the rails provided. There are a variety of rack units on the market, which may mean that the assembly procedure will differ slightly from the instructions provided. You should also refer to the installation instructions that came with the rack unit you are using. **Note:** This rail will fit a rack between 28" and 33.5" deep.

### Overview of the Rack Rails

The package includes two rail assemblies. Each is specifically designed for the left or right side of the chassis, and so marked. Each rail consists of two sections: a front section which secures to the front post of the rack and a rear section which adjusts in length and secures to the rear post of the rack.



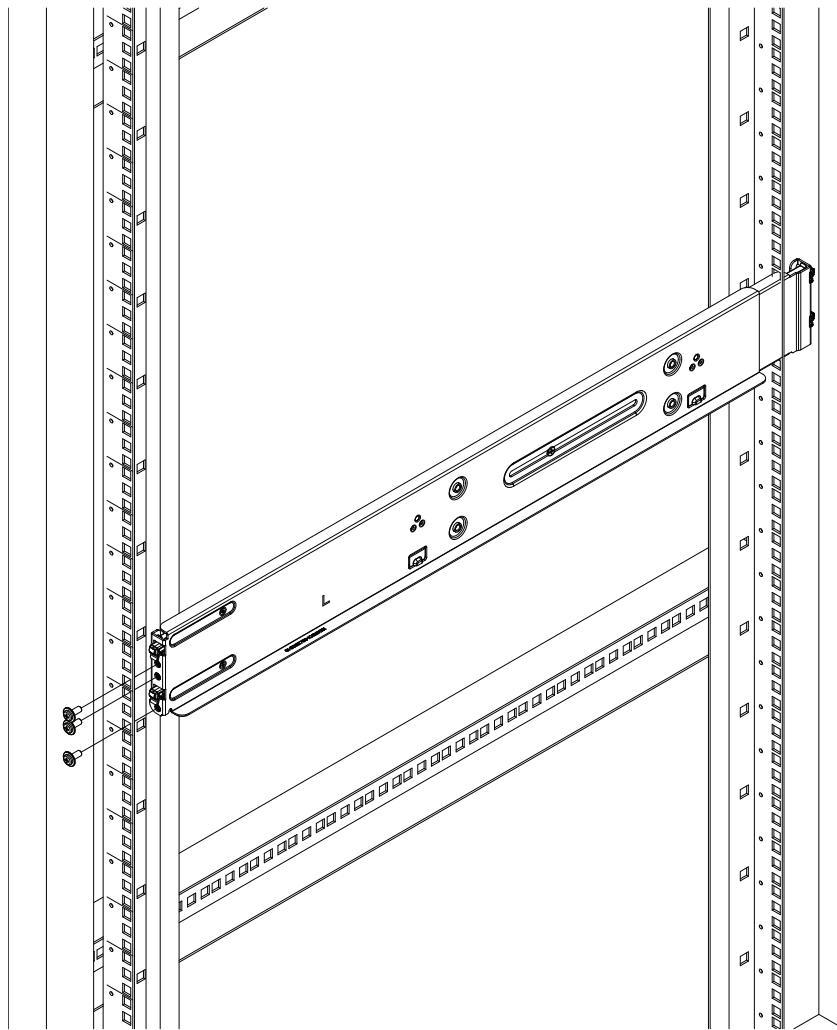
**Figure 2-1. Rackmount Rail**  
(Right rail assembly shown)

### Adjusting the Rail Length

Each rail assembly has a locking screw to adjust the length of the rail to fit the depth of your rack.

## Installing the Rails on a Rack

1. Loosen the adjusting screw to allow the rear section to slide in the front section.
2. Push the small hooks on the front section of the rail into the holes on the front post of the rack and then down, until the spring-loaded pegs snap into the rack holes. Secure the rail to the rack with screws.
3. Pull out the rear section of the outer rail, adjusting the length until it fits within the posts of the rack and align the small hooks with the appropriate holes on the rear post of the rack. Be sure the rail is level, then mount the rear section onto the rack. Secure the rail with screws.
4. Tighten the adjusting screw.

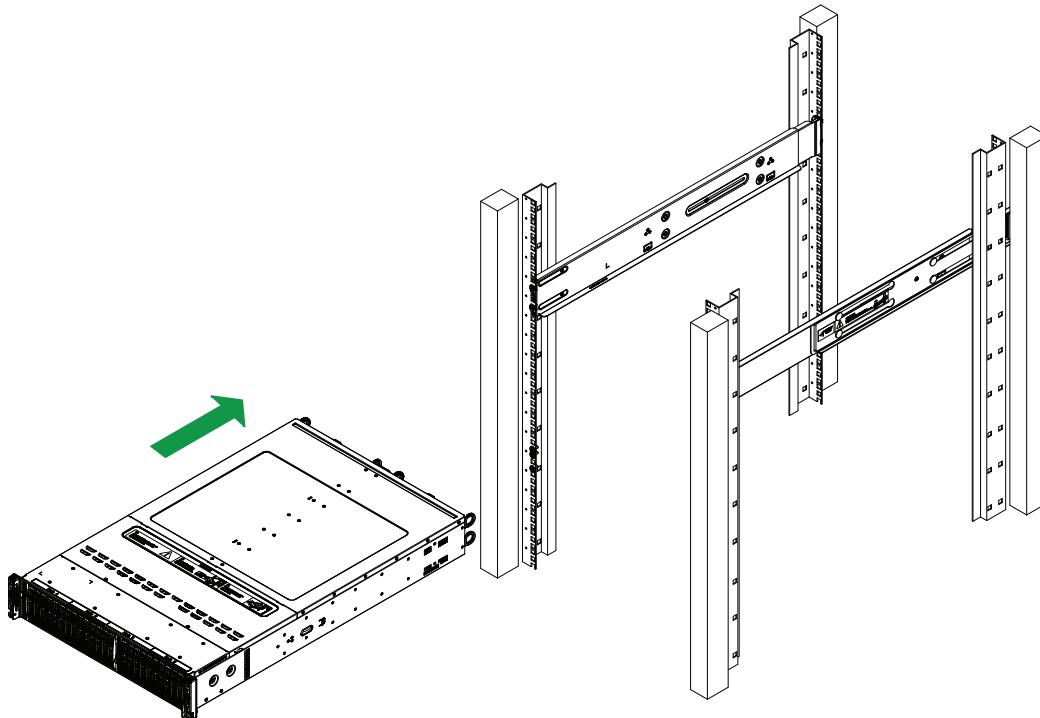


**Figure 2-2. Attaching the Rail Front to the Rack**  
(Left rail shown)

**Note:** Figures are for illustrative purposes only. Always install servers into racks from the bottom up.

## Chassis Installation

Slide the chassis into the rack so that the bottom of the chassis slides onto the bottom lip of the rails.



**Figure 2-3. Sliding the Chassis into the Rack**



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.

# 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

Before performing some setup or maintenance tasks, use the following procedure to ensure that power has been removed from the system.

#### ***Removing Power from a Node***

- Use the operating system to power down the node.

#### ***Removing Power from the System***

1. Use the operating system to power down all nodes.
2. Grasp the head of each power cord and gently pull it out of the back of the power supply.
3. Disconnect the cords from the power strip or wall outlet.

## 3.2 Accessing the System

### Removing a Computing Node Drawer

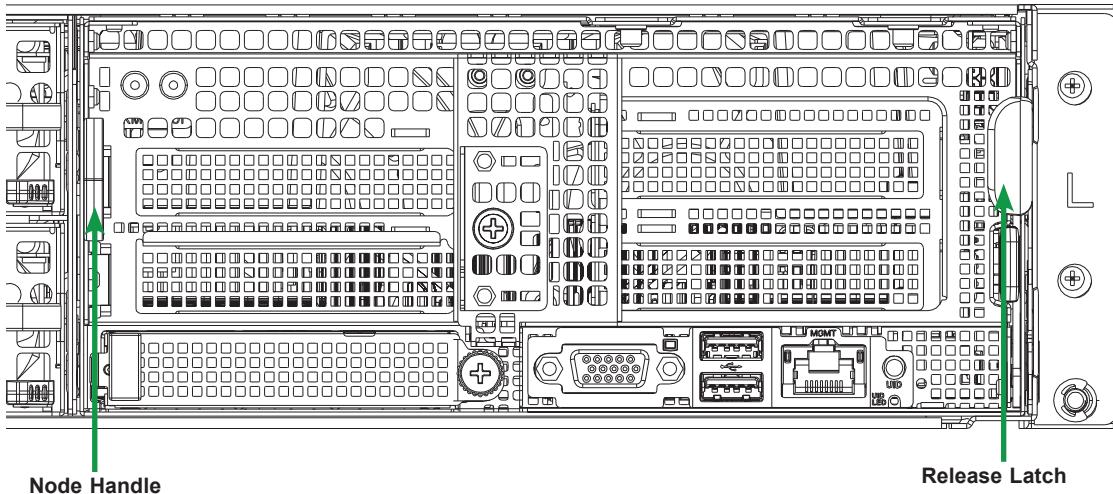


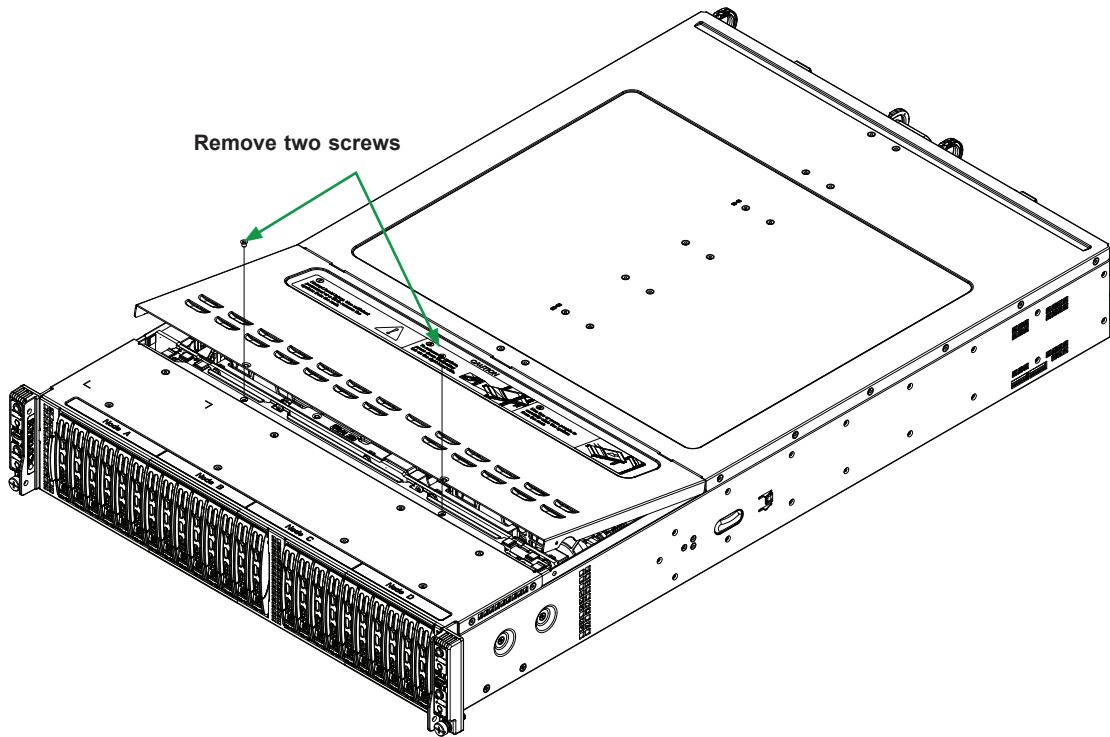
Figure 3-1. Removing a Node Tray

#### ***Removing a Node***

1. Use the operating system to power down the node.
2. Remove any cables attached to the outside of the node.
3. Press the release latch and use the handle to pull the node from the chassis.

## Removing the Chassis Cover

You can access some chassis components, such as fans, by removing the cover.



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

### ***Removing the Chassis Cover***

The chassis top cover can be lifted off after removing two screws.

**Caution:** Except for short periods of time, do not operate the server without the cover in place. It provides proper airflow to prevent overheating.

### 3.3 Processor and Heatsink

Prepare the system for processor and heatsink installation or removal. Follow the static-sensitive device precautions when working with the processor and heatsink.

#### Prepare the System

1. Remove power from the system.
2. Remove the chassis cover and any components that are obstructing the CPU socket.
3. Check that the plastic protective cover is on the CPU socket and that none of the socket pins are bent. If they are, contact your retailer.
4. Refer to the Supermicro website for updates on processor and memory support.

**Note:** All graphics in this manual are for illustration only. Your components may look different.

#### ESD Precautions

Electrostatic Discharge (ESD) can damage electronic components. Handle the motherboard carefully. The following measures are generally sufficient to protect your equipment from ESD.

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the motherboard from the antistatic bag.
- Handle the motherboard by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- 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 the socket, and may require manufacturer repairs.
- Put the motherboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure that your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.
- Use only the correct type of onboard CMOS battery. Do not install the onboard battery upside down to avoid possible explosion.

## Installation Overview

After preparing the system and following ESD precautions, there are four steps to installing the processor and heatsink onto the motherboard.

1. Attach the processor to a plastic carrier to create the processor carrier assembly.
2. Attach the processor carrier assembly to the heatsink to create the processor heatsink module (PHM).
3. Prepare the socket for PHM installation.
4. Install the PHM.

## Removal Overview

After preparing the system and following ESD precautions, there are three steps to removing the processor and heatsink from the motherboard.

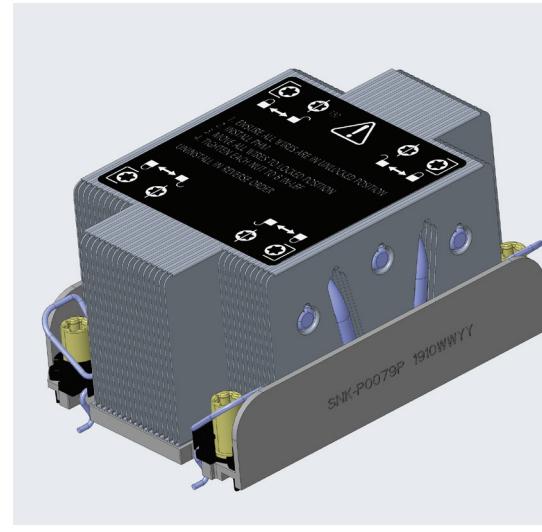
1. Remove the PHM from the motherboard.
2. Remove the processor carrier assembly from the heatsink.
3. Remove the processor from the carrier.

## Heatsink Overview

The 220BT-D Series server uses a different heatsink design for each CPU. The SNK-P0079P model is used for CPU2, the CPU closer to the mid-chassis fans. The installation and removal procedure are the same for both heatsink models.



**Figure 3-3. Heatsink SNK-P0078PW  
(for CPU1)**



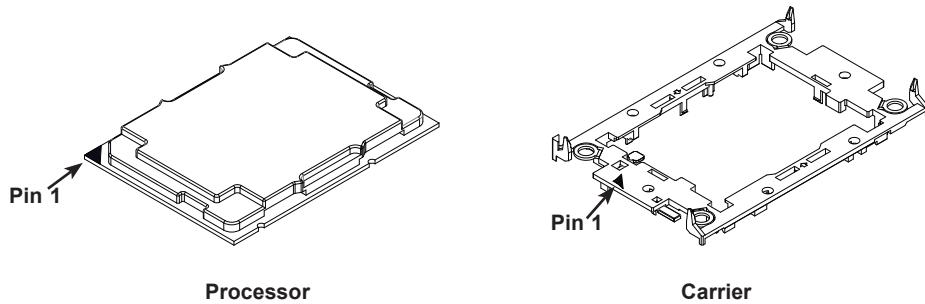
**Figure 3-4. Heatsink SNK-P0079P  
(for CPU2)**

**Note:** Thermal grease is pre-applied on new heatsinks. No additional thermal grease is needed.

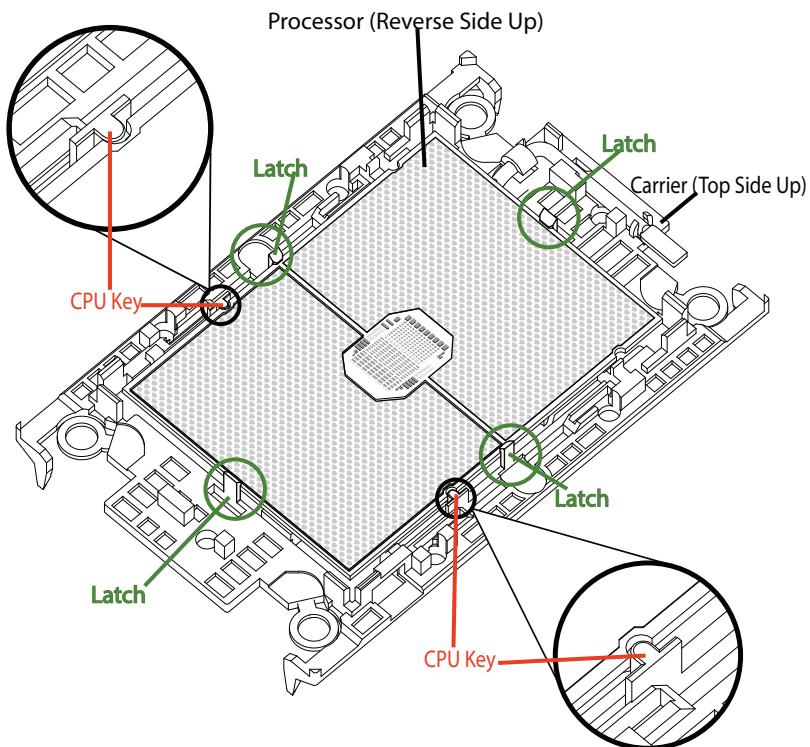
## Create the Processor Carrier Assembly

### Process Carrier Assembly

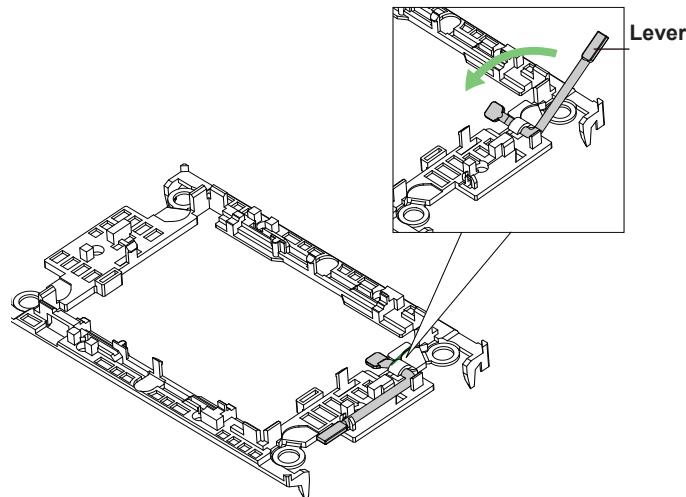
1. Hold the processor with the gold pins (LGA lands) facing down. Locate the gold triangle at the corner of the processor and the corresponding hollowed triangle on the processor carrier as shown below. These triangles indicate the location of pin 1.



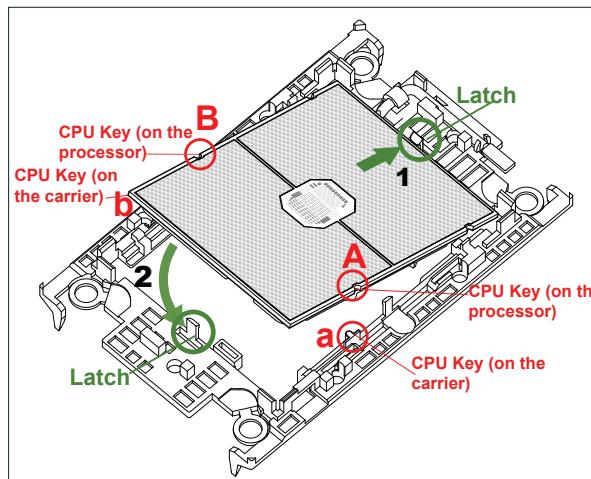
2. Turn the processor over (with the gold pins up). Locate the CPU keys on the processor and the four latches on the carrier as shown below.



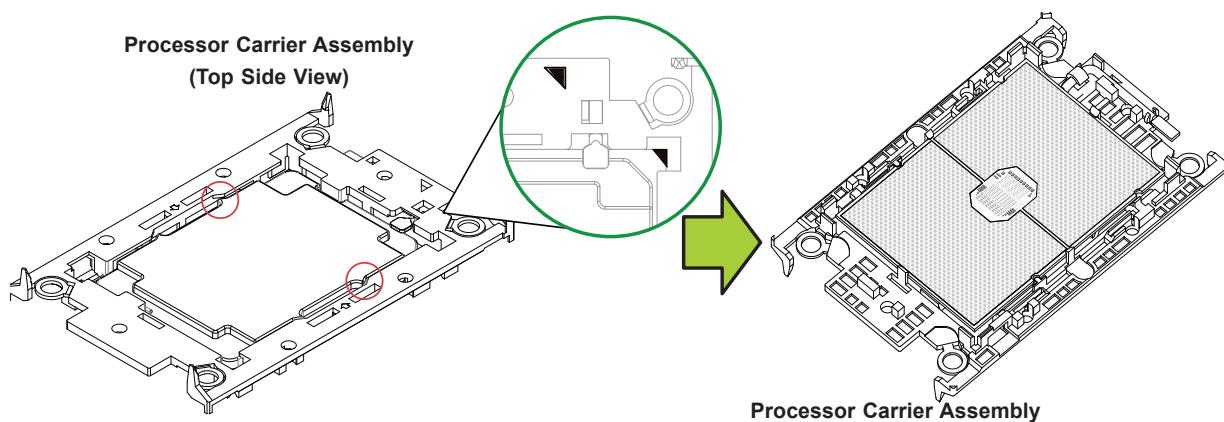
3. Locate the lever on the processor socket and press it down as shown below.



4. Using pin 1 as a guide, carefully align the CPU keys on the processor (A & B) with those on the carrier (a & b) as shown below.



5. Once aligned, carefully place one end of the processor under latch 1 on the carrier, and then press the other end down until it snaps into latch 2.

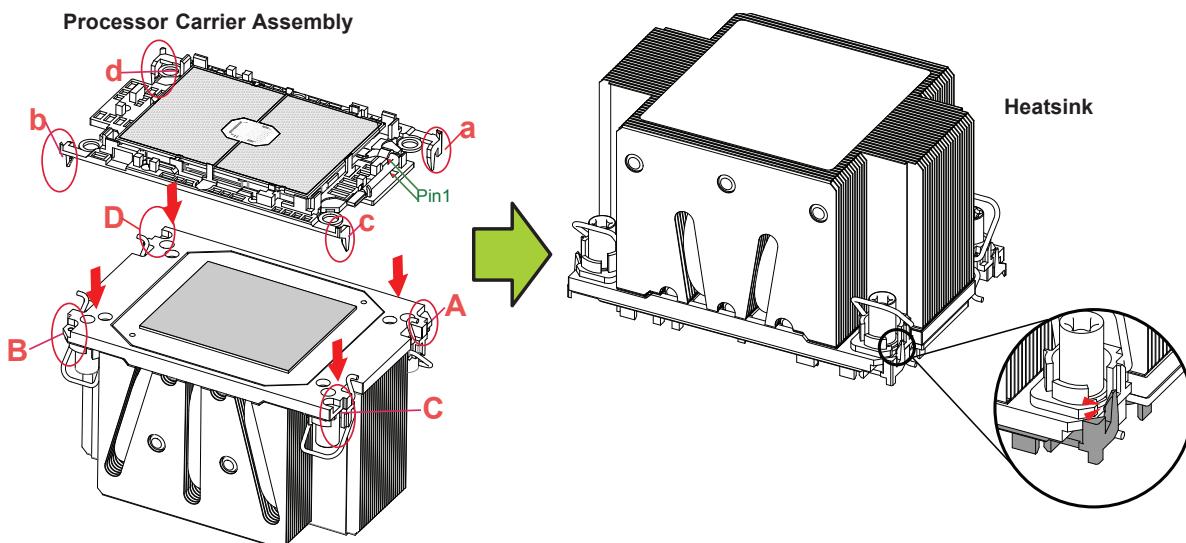


## Create the Processor Heatsink Module (PHM)

If necessary, apply the proper amount of thermal grease to the underside of the heatsink.

### Processor Heatsink Module

1. Turn the heatsink over with the thermal grease facing up. Pay attention to the two triangle cutouts (A, B) located at the diagonal corners of the heatsink as shown in the drawing below.
2. Hold the processor carrier assembly upside-down to locate the triangles on the processor and the carrier, which indicate pin 1.
3. Turn the processor carrier assembly over so that the gold pins are facing up. Locate the two pin 1 locations ("A" on the processor and "a" on the processor carrier assembly).
4. Align "a" on the processor carrier assembly with the triangular cutout "A" on the heatsink along with "b", "c", "d" on the processor assembly with "B", "C", "D" on the heatsink.
5. Once properly aligned, place the heatsink on the processor carrier assembly with all corners matched up, making sure that the four clips are properly securing the heatsink.

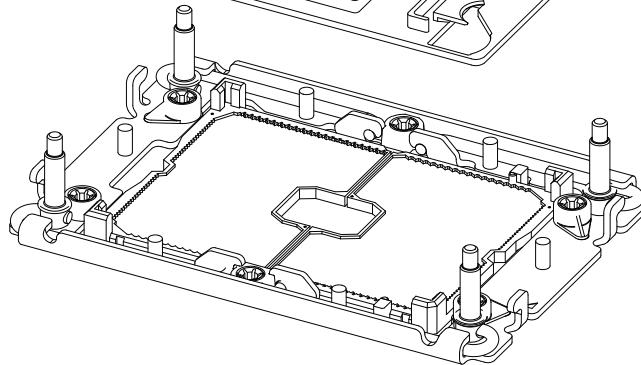
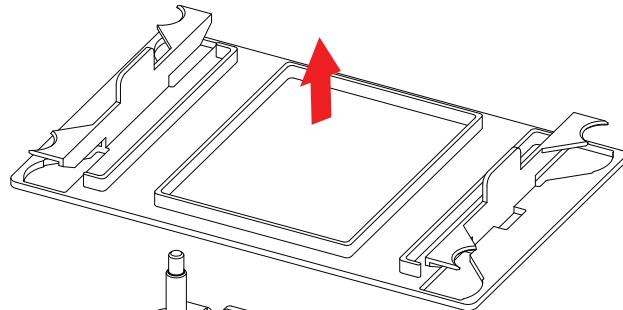
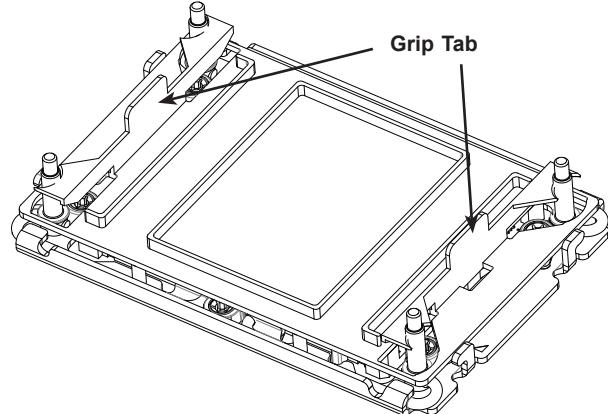


**Note:** The figure is for illustrative purposes. Your components may differ slightly from the components shown.

## Prepare the Socket

Remove the plastic protective cover on the socket by gently squeezing the grip tabs and pulling the cover off.

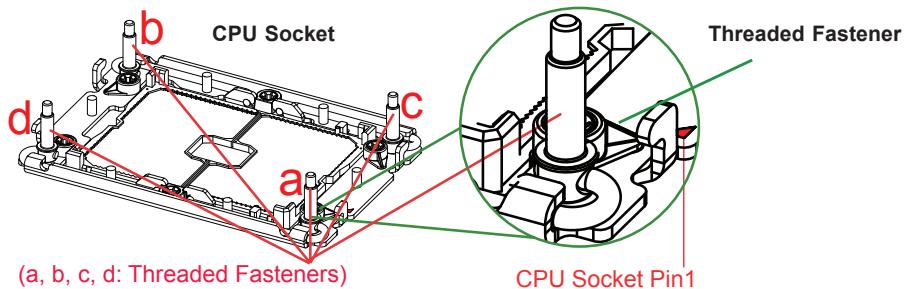
CPU Socket with Plastic Protective Cover



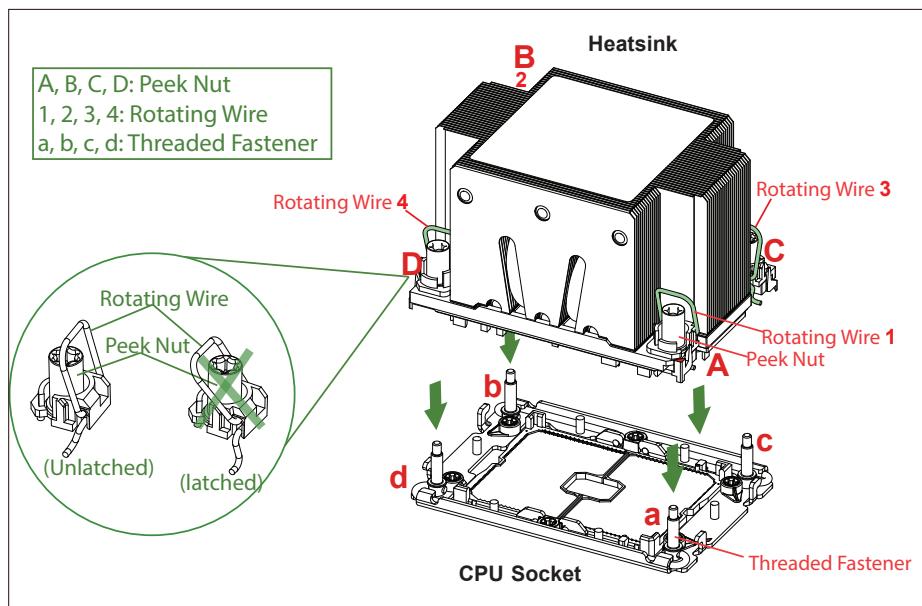
## Install the PHM

After assembling the Processor Heatsink Module (PHM), you are ready to install it into the CPU socket.

1. Locate four threaded fasteners (a, b, c, d) on the CPU socket.



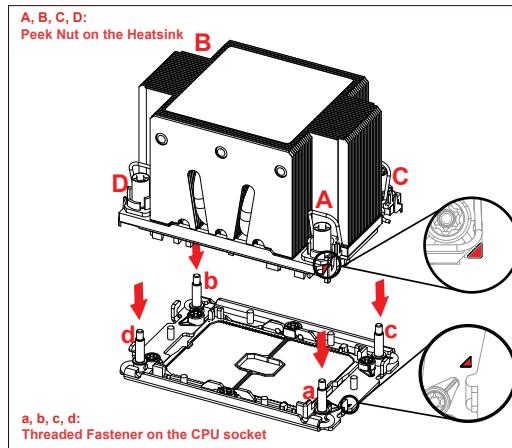
2. Locate four peek nuts (A, B, C, D) and four rotating wires (1, 2, 3, 4) on the heatsink as shown below.



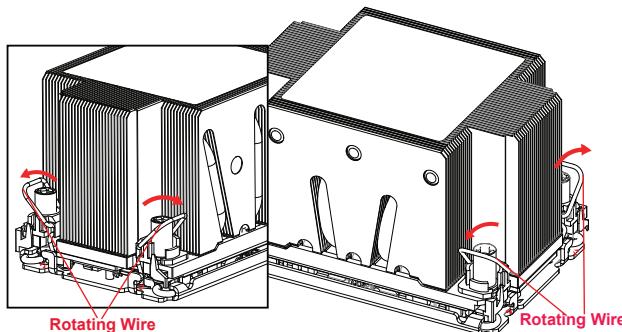
3. Check the rotating wires (1, 2, 3, 4) to make sure that they are in the unlatched position as shown.



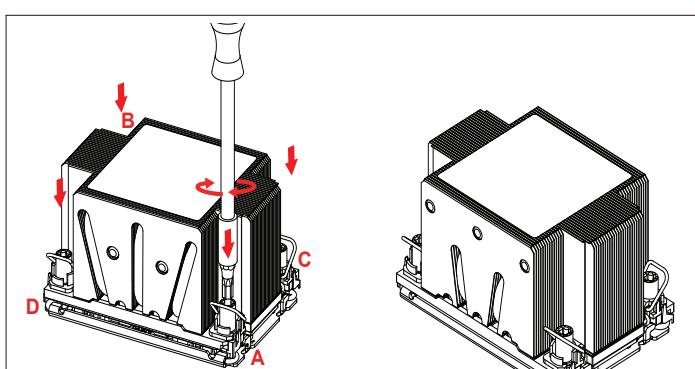
4. Align peek nut "A" (next to the triangular pin 1 on the heatsink) with threaded fastener "a" on the CPU socket. Then align peek nuts "B", "C", "D" on the heatsink with threaded fasteners "b", "c", "d" on the CPU socket, making sure that all peek nuts and threaded fasteners are properly aligned.
5. Once aligned, gently place the heatsink on the CPU socket, making sure that each peek nut is properly attached to its corresponding threaded fastener.



6. Press all four rotating wires outward and make sure that the heatsink is securely latched into the CPU socket.



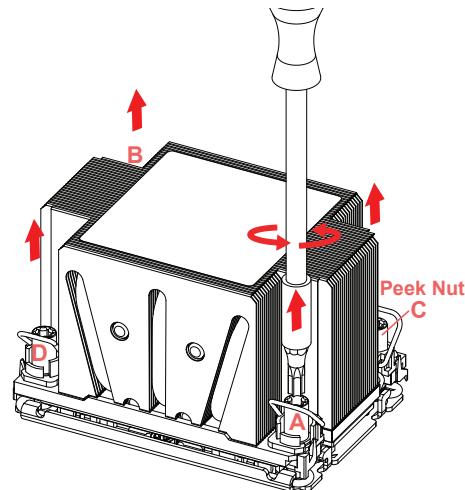
7. With a t30-bit screwdriver, tighten all peek nuts in the sequence of "A", "B", "C", and "D" with even pressure. To avoid damaging the processor or socket, do not use a force greater than 12 lbf-in when tightening the screws.
8. Examine all corners of the heatsink to ensure that the PHM is firmly attached to the CPU socket.



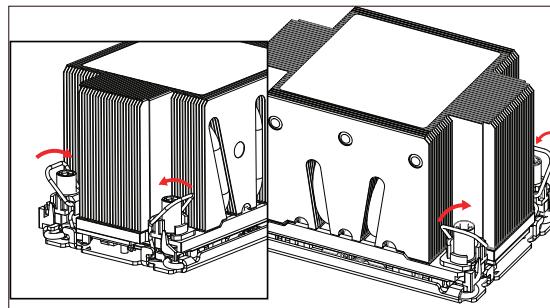
## Remove the PHM from the Motherboard

Before removing the PHM from the motherboard, first shut down the system and unplug the AC power cord from all power supplies.

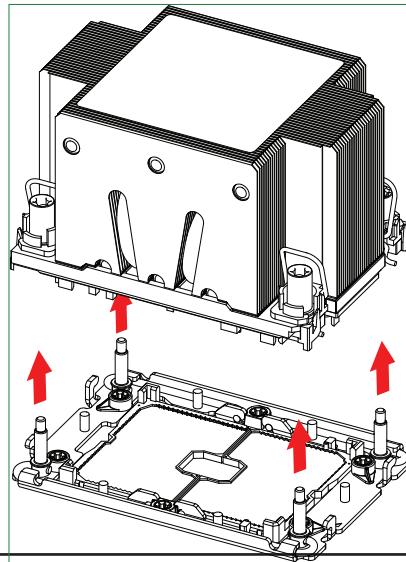
1. Use a T30-bit screwdriver to loosen the four peek nuts on the heatsink in the sequence of A, B, C, and D.



2. Once the peek nuts have been loosened from the CPU socket, press the rotating wires inward to unlatch the PHM from the socket as shown below.



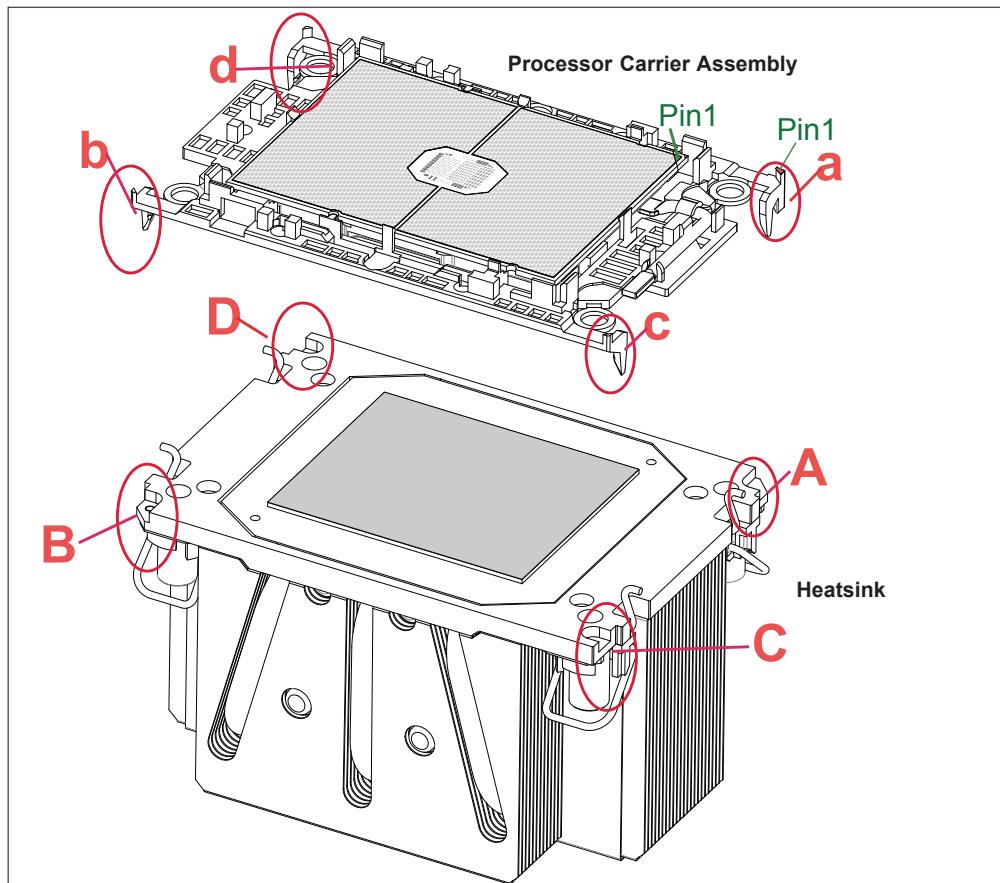
3. Gently lift the PHM upward to remove it from the CPU socket.



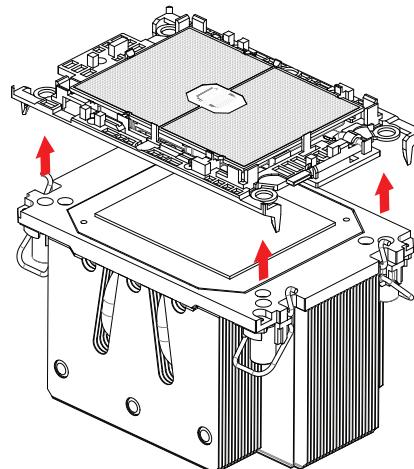
## Remove the Carrier Assembly from the Heatsink

To remove the processor carrier assembly from the PHM, please follow the steps below:

1. Detach the four plastic clips (marked a, b, c, d) on the processor carrier assembly from the four corners of the heatsink (marked A, B, C, D) as shown below.



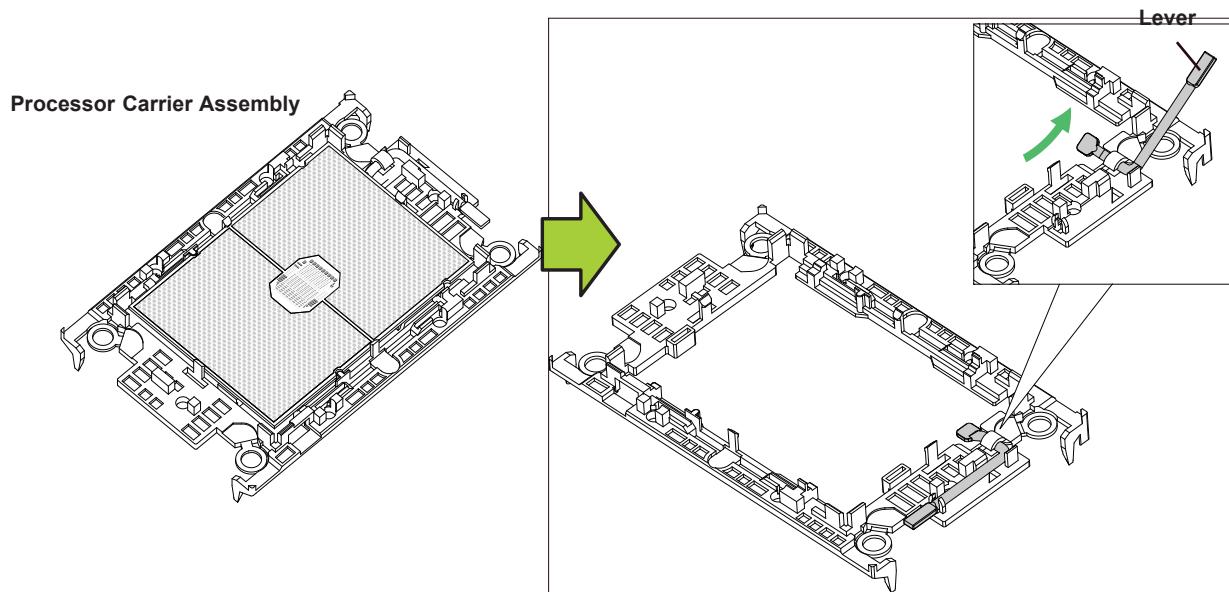
2. When all plastic clips have been detached from the heatsink, remove the processor carrier assembly from the heatsink



## Remove the Processor from the Carrier Assembly

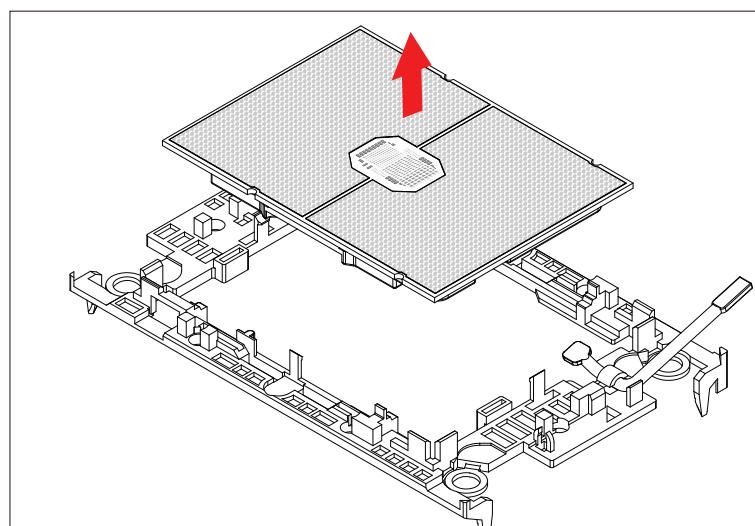
Once you have removed the processor carrier assembly from the PHM, you are ready to remove the processor from the processor carrier by following the steps below.

1. Unlock the lever from its locked position and push it upwards to disengage the processor from the processor carrier as shown below right.



2. Once the processor has been loosened from the carrier, carefully remove the processor from the carrier.

**Note:** Please handle the processor with care to avoid damaging it or its pins.



## 3.4 Memory

The X12DPT-B6 supports up to 4TB of 3DS RDIMM DDR4 ECC memory with speeds of 3200/2933/2666 MHz in 16 memory slots and up to 4TB of Intel Optane PMem 200 Series memory with speeds of up to 3200 MHz. (See the notes below.)

**Note 1:** P1-DIMMC2/P2-DIMMC2 memory slots are reserved for Intel Optane PMem 200 Series only.

**Note 2:** Memory speed support depends on the processors used in the system.

### *Memory Support for the 3rd Gen Intel Xeon Scalable Processors*

Memory Support for the 3rd Gen Intel Xeon Scalable Processors					
Type	Ranks Per DIMM & Data Width	DIMM Capacity (GB)		Speed (MT/s); Voltage (V); Slot Per Channel (SPC) and DIMM Per Channel (DPC)	
				1DPC (1-DIMM Per Channel)	2DPC (2-DIMM Per Channel)
RDIMM	SRx8	8GB	16GB	3200	2933*
	SRx4	16GB	32GB		
	DRx8	16GB	32GB		
	DRx4	32GB	64GB		
RDIMM-3DS	(4R/8R)X4	2H-64GB 4H-128GB	2H-128GB 4H-256GB		

### Memory Population Table for the 3rd Gen Intel Scalable Processor

Memory Population for the X12 DP Motherboard, 20 DIMM Slots	
CPUs/DIMMs	Memory Population Sequence
<b>1 CPU &amp; 1 DIMM</b>	A1
<b>1 CPU &amp; 2 DIMMs*</b>	A1, E1
<b>1 CPU &amp; 4 DIMMs*</b>	A1, E1, C1, G1
<b>1 CPU &amp; 6 DIMM</b>	A1, E1, C1, G1, B1, F1
<b>1 CPU &amp; 8 DIMMs*</b>	A1, E1, C1, G1, B1, F1, D1, H1
<b>1 CPU &amp; 9 DIMMs</b>	A1, E1, C1, G1, B1, F1, D1, H1, C2 <i>(C2: Reserved for PMem 200 Series only)</i>
<b>2 CPUs &amp; 2 DIMMs*</b>	CPU1: A1 CPU2: A1
<b>2 CPUs &amp; 4 DIMMs*</b>	CPU1: A1, E1 CPU2: A1, E1
<b>2 CPUs &amp; 6 DIMMs</b>	CPU1: A1, E1, C1, G1 CPU2: A1, E1
<b>2 CPUs &amp; 8 DIMMs*</b>	CPU1: A1, E1, C1, G1 CPU2: A1, E1, C1, G1
<b>2 CPUs &amp; 10 DIMMs</b>	CPU1: A1, E1, C1, G1, B1, F1 CPU2: A1, E1, C1, G1
<b>2 CPUs &amp; 12 DIMMs*</b>	CPU1: A1, E1, C1, G1, B1, F1 CPU2: A1, E1, C1, G1, B1, F1
<b>2 CPUs &amp; 14 DIMMs</b>	CPU1: A1, E1, C1, G1, B1, F1, D1, H1 CPU2: A1, E1, C1, G1, B1, F1
<b>2 CPUs &amp; 16 DIMMs*</b>	CPU1: A1, E1, C1, D1, B1, F1, G1, H1 CPU2: A1, E1, C1, D1, B1, F1, G1, H1
<b>2 CPUs &amp; 18 DIMMs</b>	CPU1: A1, E1, C1, D1, B1, F1, G1, H1, C2 <i>(C2: Reserved for PMem 200 Series only)</i> CPU2: A1, E1, C1, D1, B1, F1, G1, H1, C2 <i>(C2: Reserved for PMem 200 Series only)</i>

**Note 1:** P1-DIMMC2 and P2-DIMMC2 are reserved for Intel® Optane™ PMem 200 Series only.

**Note 2:** To maximize memory performance, please use the memory configurations marked with "\*" above (also shaded in orange) as these configurations are recommended by Supermicro for optimal memory performance.

### Intel Optane PMem 200 Series Memory Population Table

**Note:** PMem 200 Series are supported on 3rd gen Intel Xeon Scalable Platinum, Gold and selected Silver processors.

20-DIMM Motherboard PMem Population within 1 CPU socket												
DDR4 +Pmem	Mode	AD Inter-leave	P1-DIMMF1	P1-DIMME1	P1-DIMMH1	P1-DIMMG1	P1-DIMMG2	P1-DIMMC2	P1-DIMMC1	P1-DIMMD1	P1-DIMMA1	P1-DIMMB1
4+4	AD MM	One - x4	DDR4	<b>Pmem</b>	DDR4	<b>Pmem</b>	-	-	<b>Pmem</b>	DDR4	<b>Pmem</b>	DDR4
6+1	AD	One - x1	DDR4	DDR4	-	DDR4	-	-	DDR4	<b>Pmem</b>	DDR4	DDR4
			DDR4	DDR4	<b>Pmem</b>	DDR4	-	-	DDR4	DDR4	DDR4	DDR4
			<b>Pmem</b>	DDR4	DDR4	DDR4	-	-	DDR4	DDR4	DDR4	-
			DDR4	DDR4	DDR4	-	-	-	<b>Pmem</b>	DDR4	DDR4	DDR4
			DDR4	-	DDR4	DDR4	-	-	DDR4	DDR4	<b>Pmem</b>	DDR4
			DDR4	DDR4	DDR4	<b>Pmem</b>	-	-	-	DDR4	DDR4	DDR4
			DDR4	<b>Pmem</b>	DDR4	DDR4	-	-	DDR4	DDR4	-	DDR4
8+1	AD	One - x1	DDR4	DDR4	DDR4	DDR4	-	<b>Pmem</b>	DDR4	DDR4	DDR4	DDR4

Legend (for the table above)	
DDR4 Type and Capacity	
DDR4	See Validation Matrix (DDR4 DIMMs validated with DCPMM)
Capacity	
<b>Pmem</b>	Any Capacity (Uniformly for all channels for a given configuration)

- Mode definitions: AD = App Direct Mode, MM = Memory Mode.
- For MM, NM/FM ratio is between 1:4 and 1:16. The capacity not used for FM can be used for AD. (NM = Near Memory; FM = Far Memory).
- Matrix targets configs for optimized PMem to DRAM cache ratio in MM mode.
- For each individual population, different PMem rearrangements among channels are permitted so long as the configuration doesn't break X12 DP Memory population rules.
- Ensure the same DDR4 DIMM type and capacity are used for each DDR4 + PMem population.
- If the system detects an unvalidated configuration, then the system issues a BIOS warning. The CLI functionality is limited in non-POR configurations, and select commands will not be supported.

Validation Matrix (DDR4 DIMMS w/Pmem 200 Series)			
DIMM Type	Ranks Per DIMM & Data Width (Stack)	DIMM Capacity (GB)	
		DRAM Density	
		8Gb	16Gb
RDIMM (up to 3200)	1Rx8	N/A	N/A
	1Rx4	16GB	32GB
	1Rx8	16GB	32GB
	1Rx4	32GB	64GB
RDIMM 3DS (up to 3200)	4Rx4 (2H)	N/A	128GB
	8Rx4 (4H)	NA	256GB

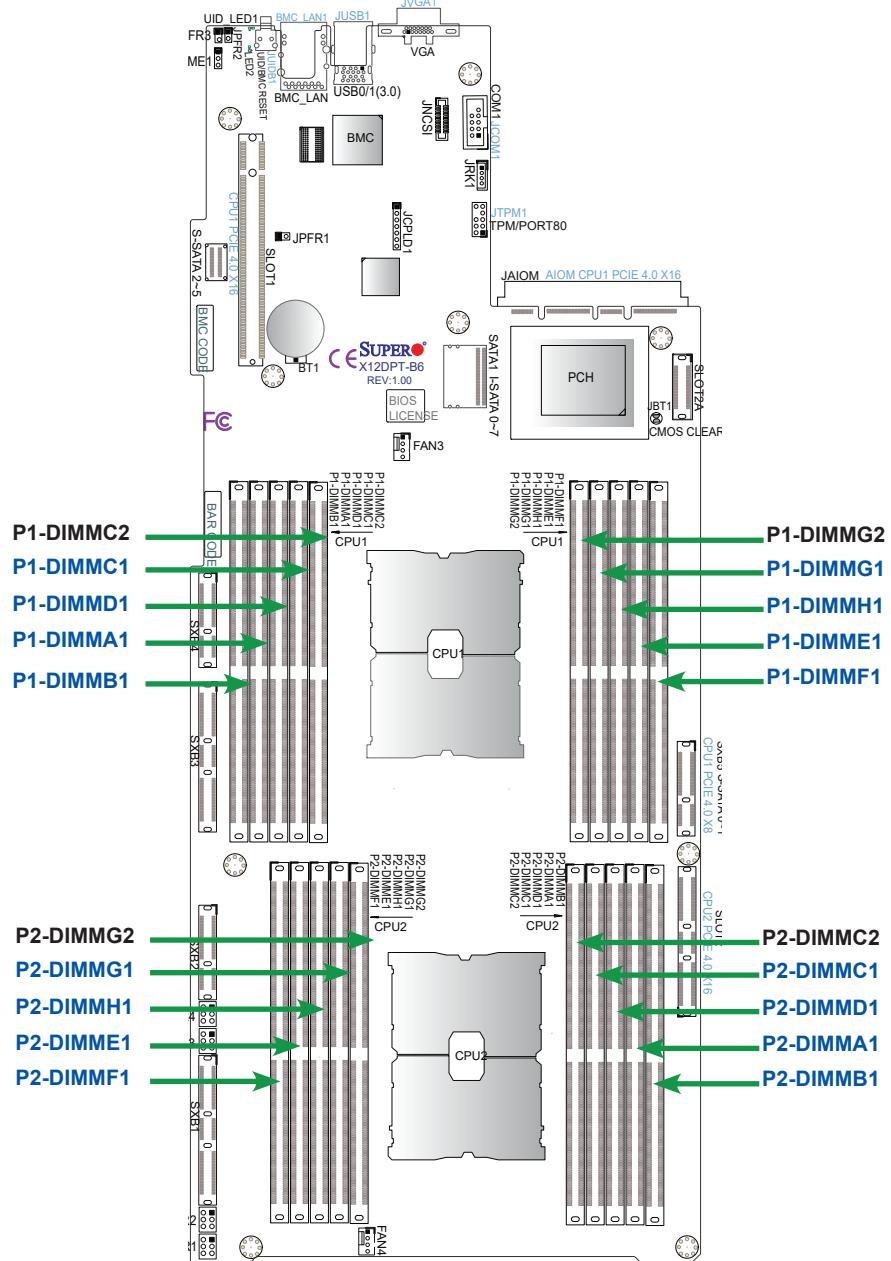
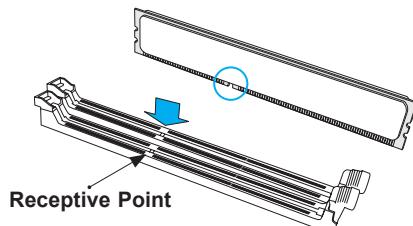


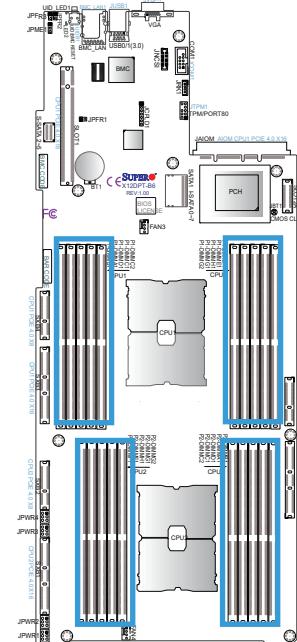
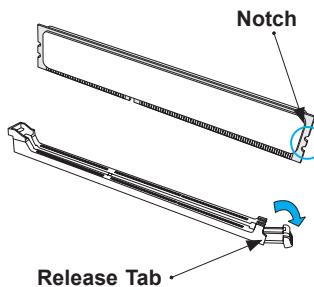
Figure 3-5. DIMM Slots

## DIMM Installation

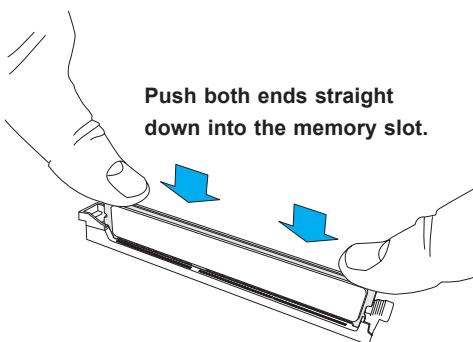
1. Insert the desired number of DIMM modules based on the recommended DIMM population table on page 45.
2. Align the DIMM module key with the receptive point on the single-latch DIMM slot.



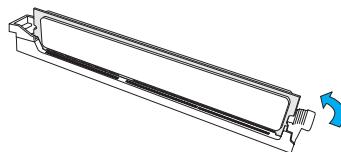
3. Push the release tab outwards to unlock the slot.



4. Press both ends of the module straight down into the slot until the module snaps into place.



5. Push the release tab to the lock position to secure the module into the slot.



## DIMM Removal

Reverse the steps above to remove the DIMM modules from the motherboard.

## 3.5 Motherboard Battery

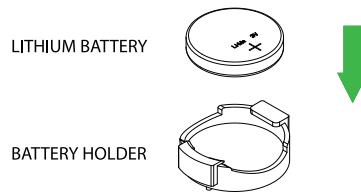
The motherboard uses non-volatile memory to retain system information when system power is removed. This memory is powered by a lithium battery residing on the motherboard.

### *Replacing the Battery*

Begin by [removing the node](#) from the system.

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 3-6. 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 (BR2032).

## 3.6 Storage Drives

The CSE-217BD chassis supports 24 hot-swap 2.5" storage drives (HDDs or SSDs). Each node controls 12 drives.

- DNTR: 24 hybrid SATA3/NVMe drives
- DNC8R: 24 hybrid SAS3/SATA3/NVMe drives (SAS3 supported via Broadcom 3816)

### Drive Carriers

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

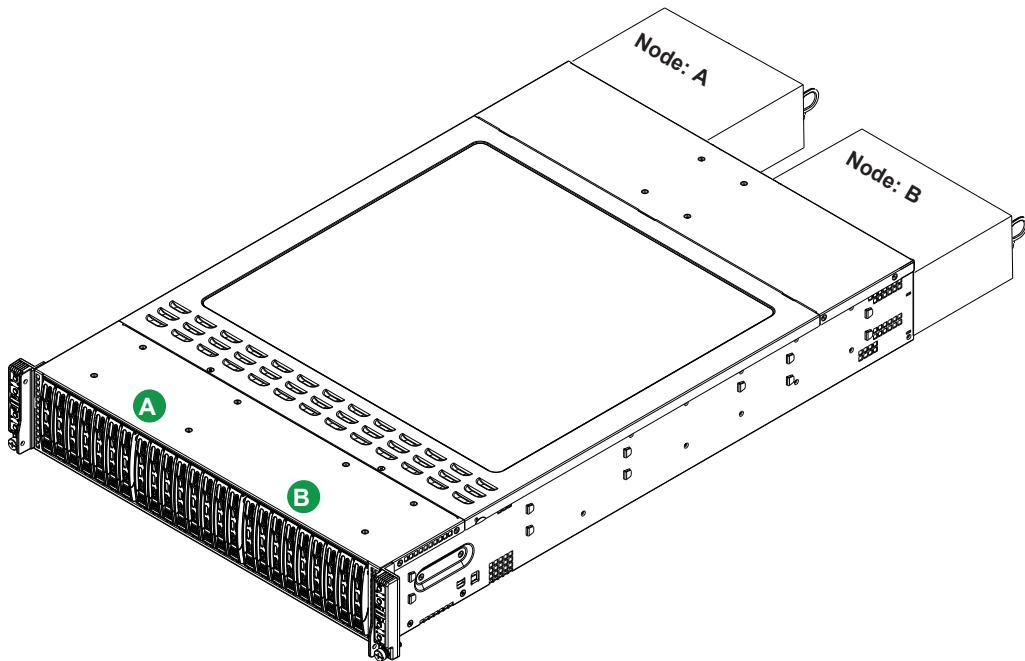
Drive Carrier LED Indicator			
	Color	Blinking Pattern	Behavior for Device
Activity LED	Blue	Solid On	SAS/NVMe drive installed
	Blue	Blinking	I/O activity
Status LED	Red	Solid On	Failure of drive with RSTe support
	Red	Blinking at 1 Hz	Rebuild drive with RSTe support
	Red	Blinking with two blinks and 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)

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

## Drive Configuration

The CSE-217BD chassis contains two separate computing node drawers, each with its own motherboard. Each node controls a set of 12 drives. If a node drawer is pulled out of the chassis, the drives associated with that node will power down.

Node Drawer Locations	
Node A controls drives A1-A12	Node B controls drives B1-B12



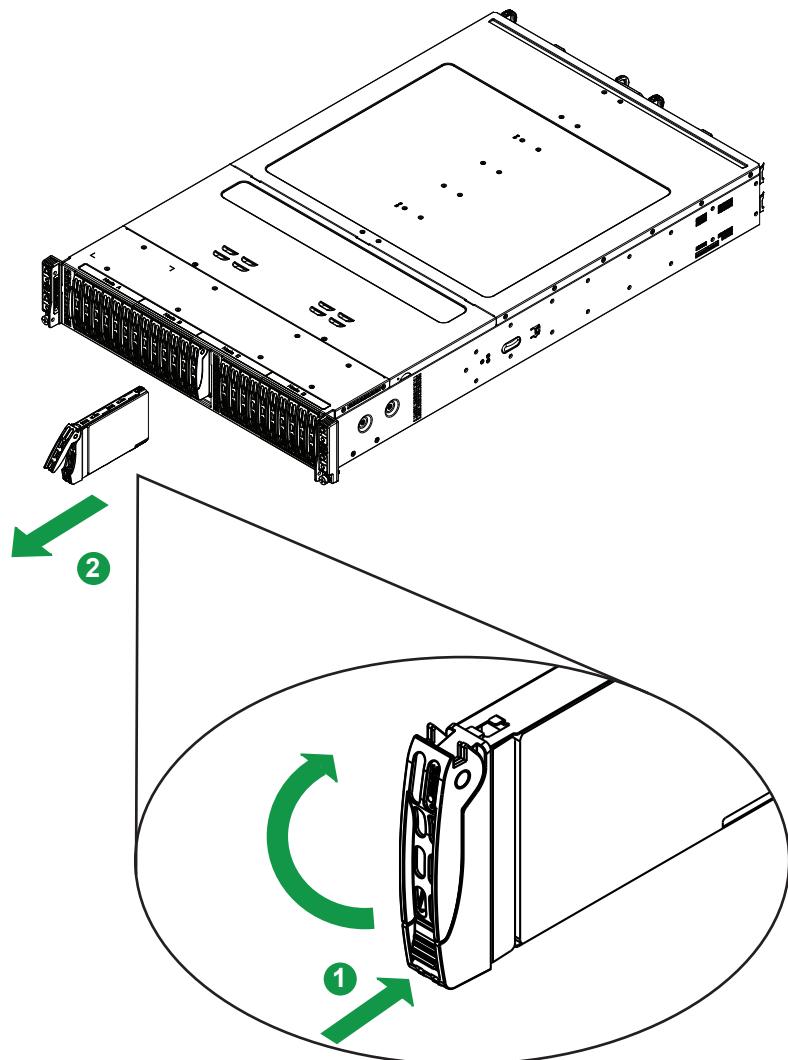
**Figure 3-7. Storage Drives and the Corresponding Nodes**

## Installing Drives

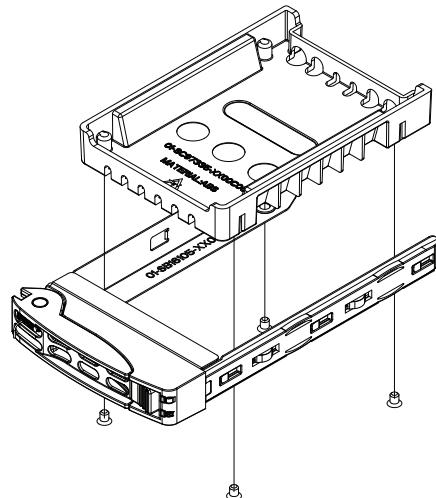
### ***Removing Drive Carriers from the Chassis***

1. Press the release button on the drive carrier. This extends the drive carrier handle.
2. Use the handle to pull the carrier out of the chassis (Figure 3-8).
3. Remove the dummy drive from the carrier (Figure 3-9).

**Caution:** Except for short periods of time (swapping drives), do not operate the server with the drive carriers removed from the bays, regardless of how many drives are installed, for proper airflow.



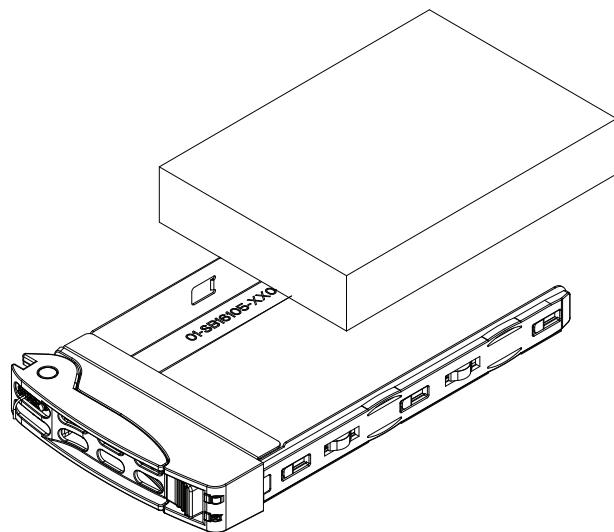
**Figure 3-8. Removing a Drive Carrier**



**Figure 3-9. Removing a Dummy Drive from the Drive Carrier**

#### ***Installing a Drive***

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



**Figure 3-10. Installing the Hard Drive**

3. Insert the drive and carrier into its bay vertically, keeping the carrier oriented so that the release button is on the bottom. When the carrier reaches the rear of the bay, the release handle starts to retract.
4. Push the upper part of the drive carrier handle until it clicks into the locked position.

## Hot-Swap for NVMe Drives

Supermicro 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 BMC.

**Note:** If you are using VROC, see the [Hot-Swap Drives](#) section in Appendix C instead.

### Ejecting a Drive

1. **BMC > System > Storage Monitoring > Physical View**
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 220BT-D Series server has one Device and one Group.

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

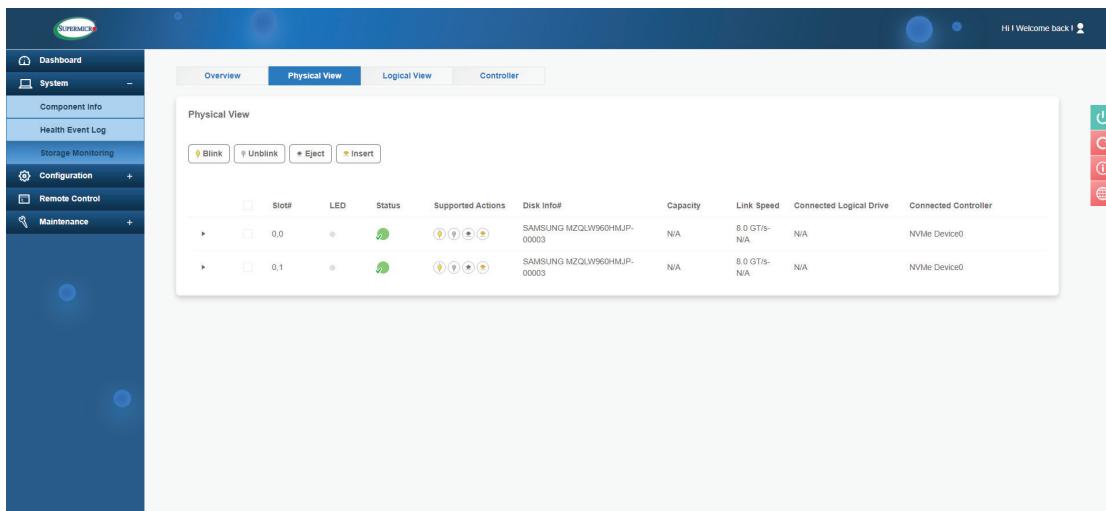


Figure 3-11. BMC Screenshot

### Replacing the Drive

1. Insert the replacement drive.
2. **BMC > System > Storage Monitoring > Physical View**
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***

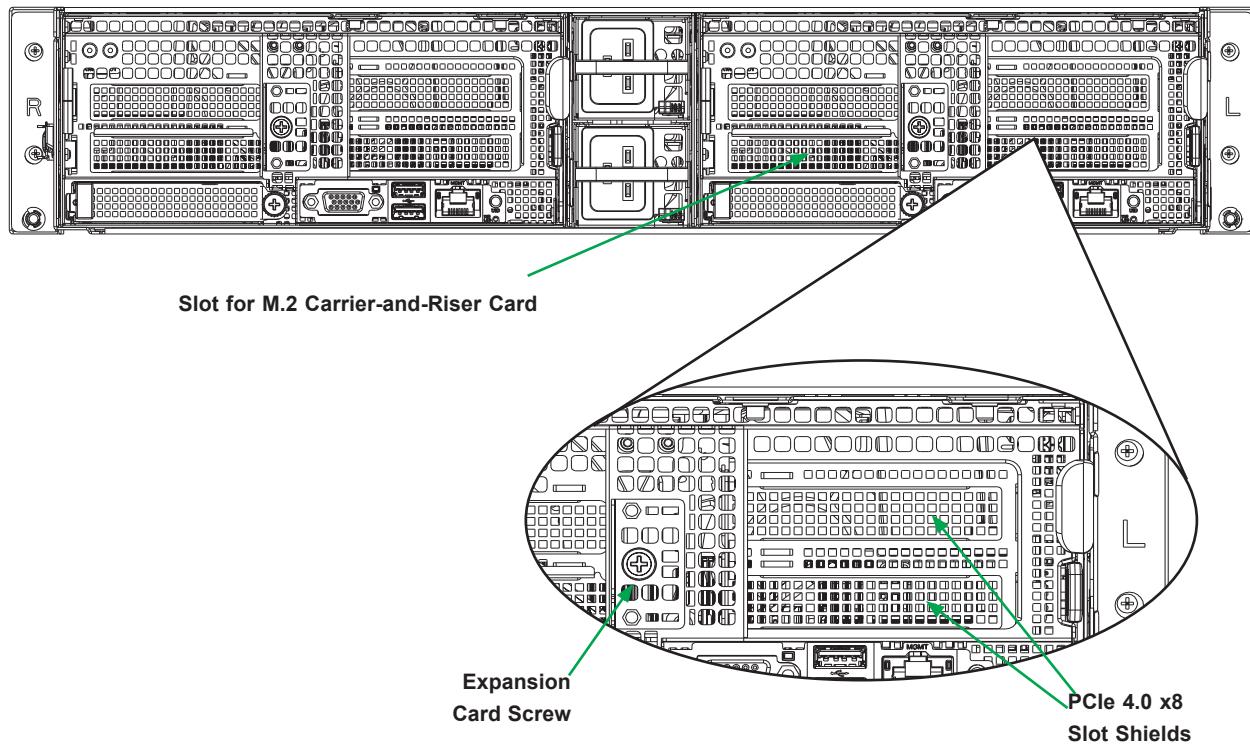
There are two ways to check using BMC.

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

- **BMC > Server Health > NVMe SSD** – Shows the temperatures of all NVMe drives, as in Figure 3-11.
- **BMC > Server Health > Sensor Reading > NVME\_SSD** – Shows the single highest temperature among all the NVMe drives.

## Adding an Expansion Card

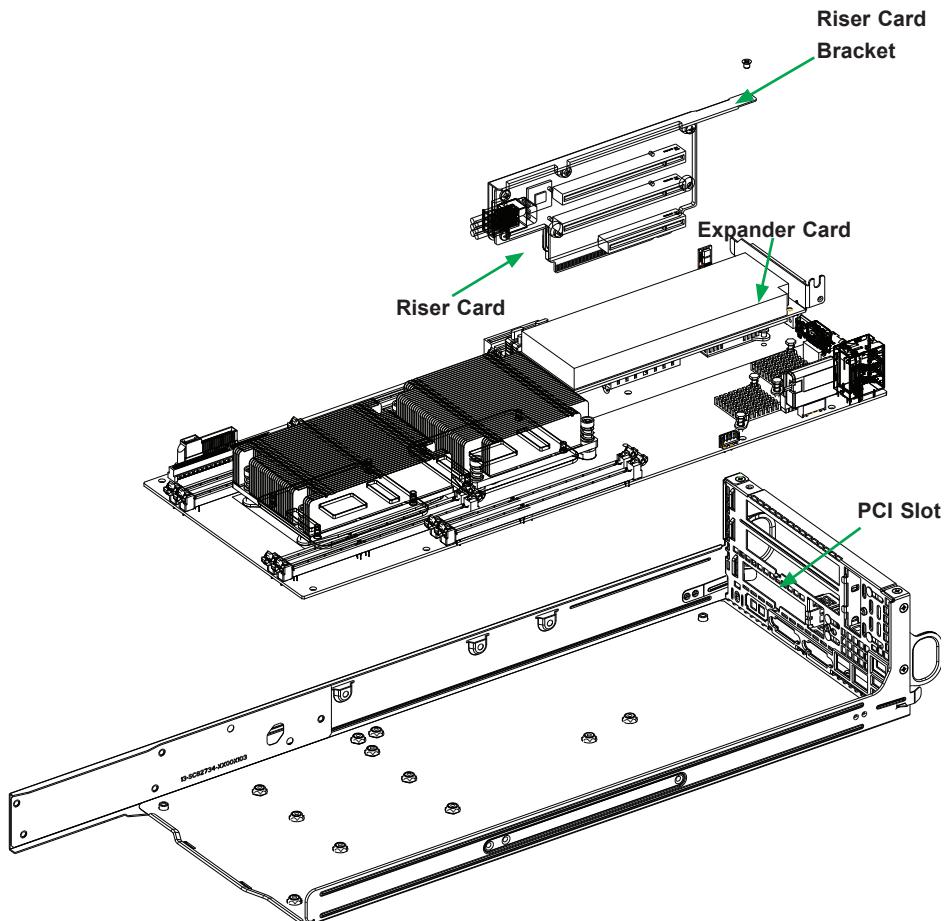
The CSE-217BD chassis supports expansion cards. Riser cards are used to mount the expansion cards. Each node can accommodate three PCIe cards, two full-height full-length and one low-profile.



**Figure 3-12. Expansion Card Slots**

### Installing PCIe 4.0 x8 Expansion Cards

1. If necessary, [power down](#) the node, remove it [from the chassis](#), remove the expansion card screw (See Figure 3-12) and set aside.
2. Remove the PCI slot shields.
3. If the riser card (p/n RSC-P2R-88G4) is not installed, attach the riser card to the riser card bracket.
4. Insert an expansion card into the riser slot to create an assembly.
5. Align the assembly with SLOT1 on the motherboard and the PCI slot shield at the chassis rear.
6. Insert the assembly into the motherboard and install a screw to hold the expansion card to the chassis.
7. Continue to install the M.2 carrier-and-riser card or reinstall the expansion card screw, reinsert the node into the chassis and power up the system.



**Figure 3-13. Installing the Expansion Card**

**Note:** Figure is for illustrative purposes only. Your system may or may not resemble this picture.

### Installing M.2 Carrier-and-Riser Card

1. [Power down](#) the node and remove it [from the chassis](#).
2. Remove the expansion card screw (See Figure 3-12) and set aside. Remove the PCI slot shield.
3. Attach brackets onto the M.2 carrier-and-riser card, if necessary.
4. Insert an expansion card into the riser slot of the M.2 carrier-and-riser card to create an assembly (not shown).
5. Install the M.2 SSD, if necessary.

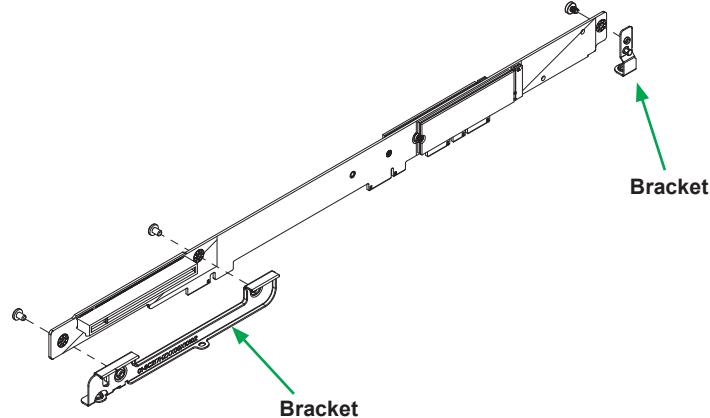


Figure 3-14. Installing Brackets

6. Align the assembly with SLOT2 on the motherboard and the PCI slot shield at the node rear and insert the assembly into the motherboard.
7. Reinstall the expansion card screw, reinsert the node into the chassis, and power up the system.

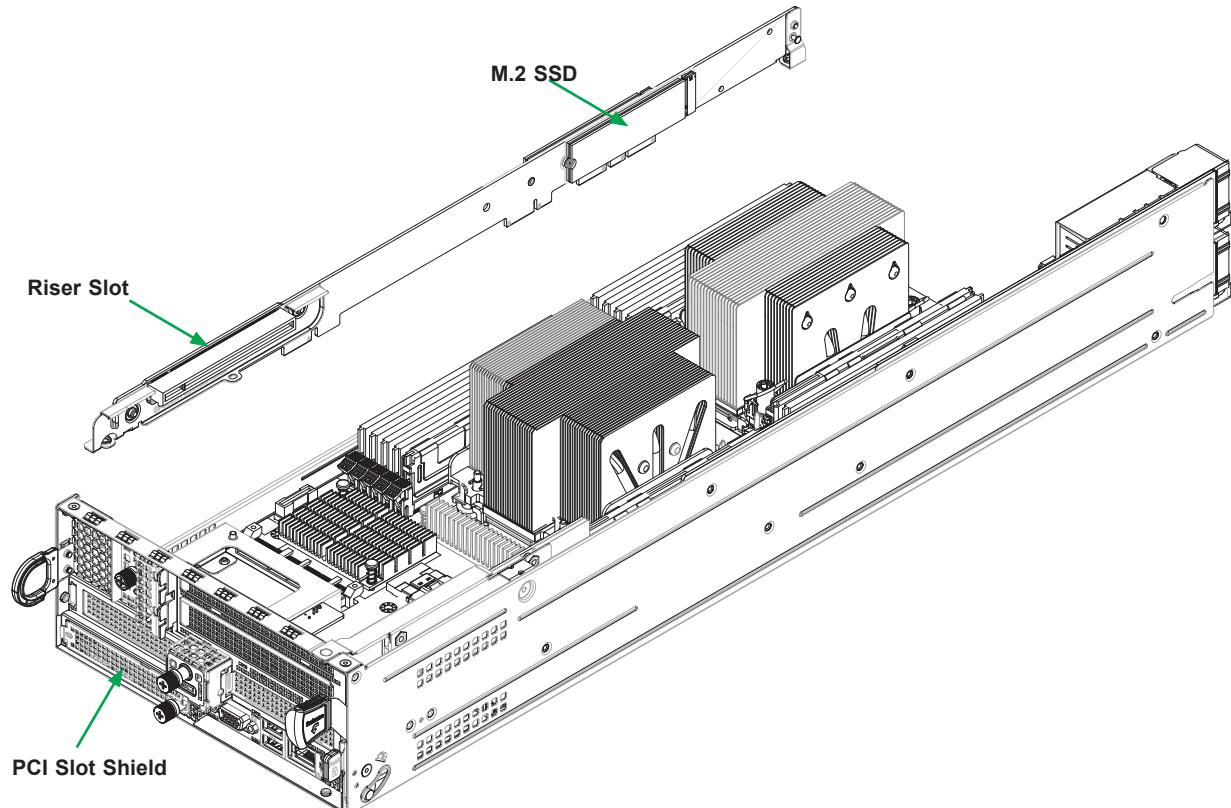


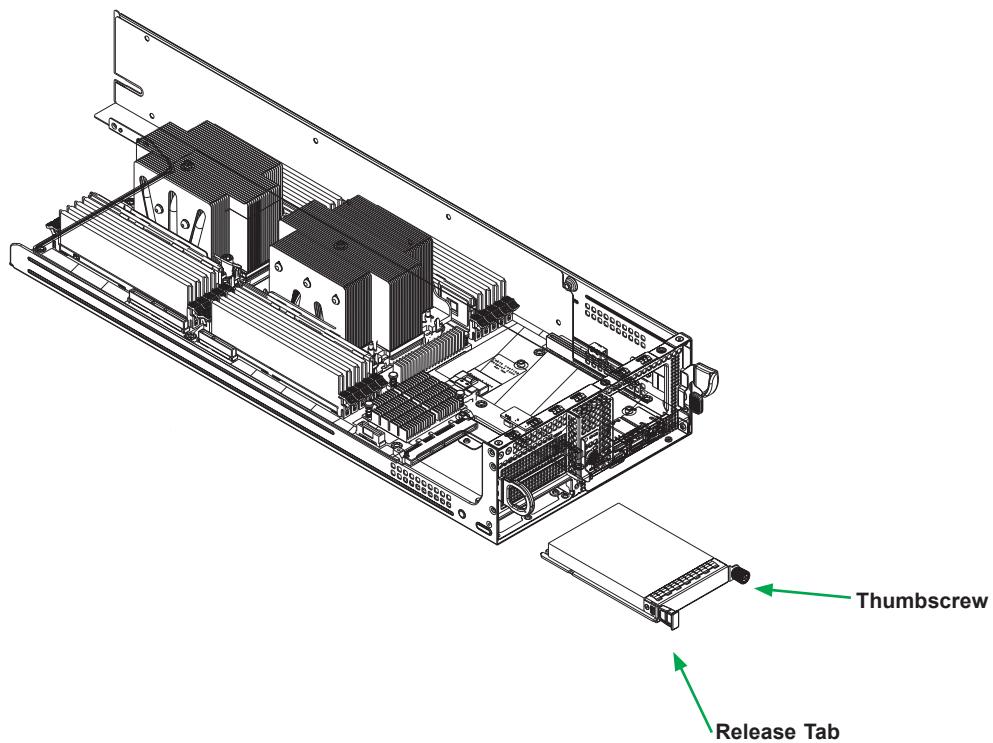
Figure 3-15. Installing Expansion Card onto M.2 Carrier-and-Riser Card

## AIOM Card

The Supermicro Advanced Input/Output module (AIOM) card provides options for network connection. It is inserted into an AIOM slot on the motherboard tray.

### ***Removing the AIOM Card***

1. Press the release tab and loosen the thumbscrew on the AIOM card.
2. Grasp the release tab and the thumbscrew and pull the AIOM out of the node tray.



**Figure 3-16. AIOM Card Position on Node Drawer Rear**

### ***Installing the AIOM Card***

1. Insert the AIOM card into the motherboard tray slot as shown until the release tab retracts.
2. Tighten the thumbscrew.

## 3.7 System Cooling

### Fans

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

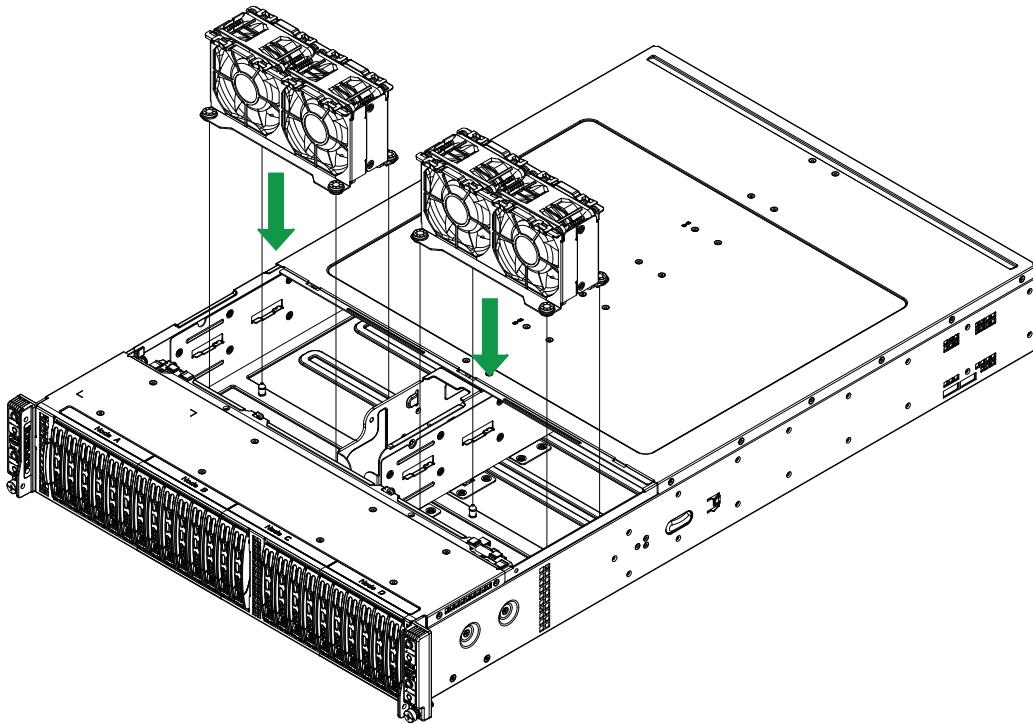
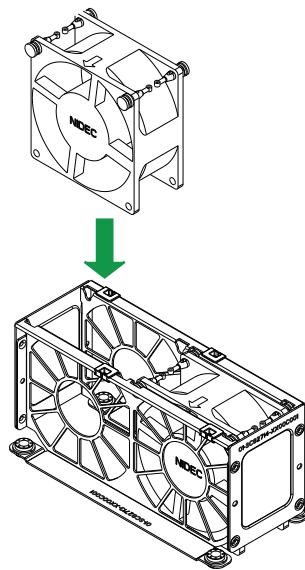


Figure 3-17. System Fan Placement

#### ***Changing a System Fan***

1. Determine which fan is failing. If possible, use BMC. If not, remove the chassis cover while the power is on, and examine the fans to determine which one has failed.
2. Remove power from the system as described in Section 3.1.
3. Remove the fan cable from the backplane for the failed fan and the adjacent fan.
4. Lift the fan housing up and out of the chassis.
5. Push the fan up from the bottom and out of the top of the housing.



**Figure 3-18. Replacing a System Fan in the Fan Housing**

6. Place the replacement fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.
7. Put the fan housing back into the chassis and reconnect the cable.
8. Power on the system to confirm that the fan is working properly before replacing the chassis cover.

## Installing Air Shroud

The system requires air shrouds for each node to maximize airflow efficiency.

### *Installing Air Shroud*

The motherboard, any expansion cards, and all components must be installed in the node tray.

Place the air shroud as pictured and secure them with screws.

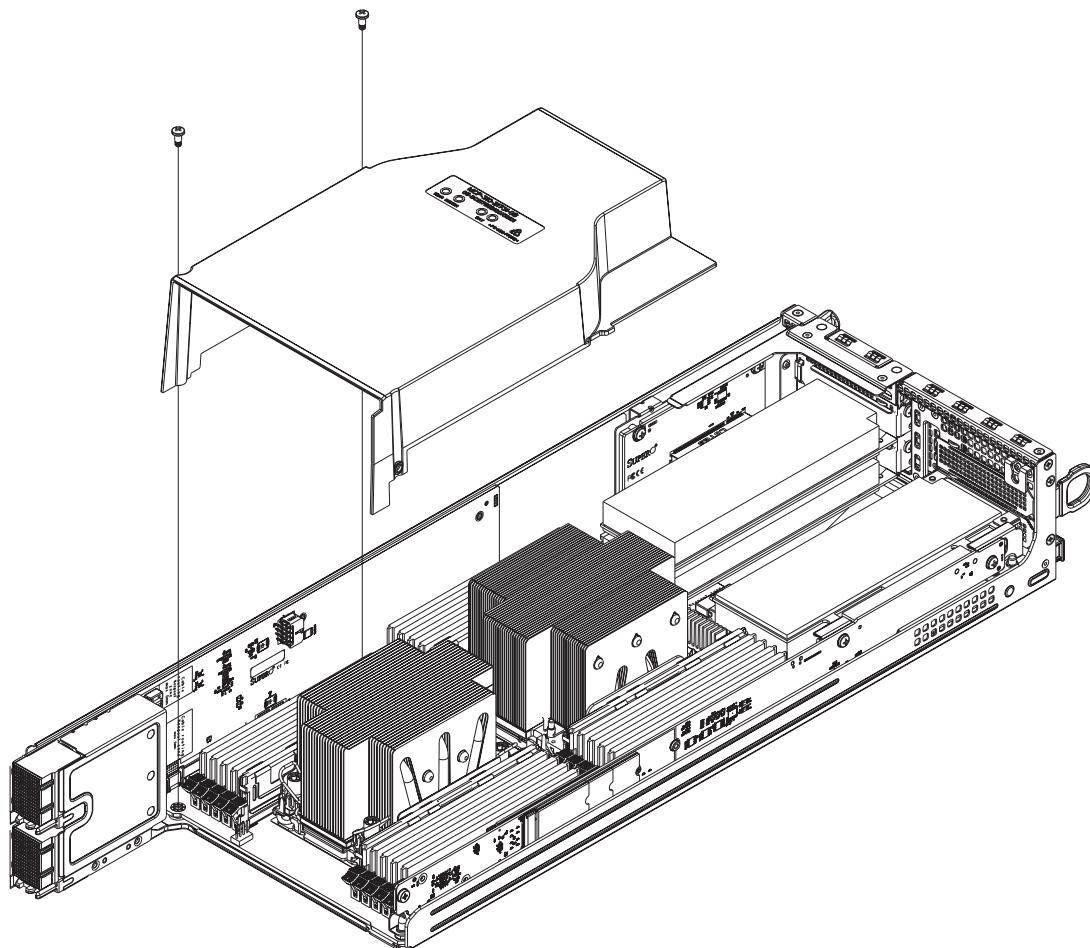


Figure 3-19. Installing the Air Shroud

## *Checking the Airflow*

### *Checking Airflow*

- Make sure there are no objects obstructing the airflow in and out of the chassis.
- Except for brief periods while swapping hard drives, do not operate the server without the drive carriers in the drive bays.
- Make sure no wires or foreign objects obstruct airflow through the chassis. Pull all excess cabling out of the airflow path or use shorter cables.

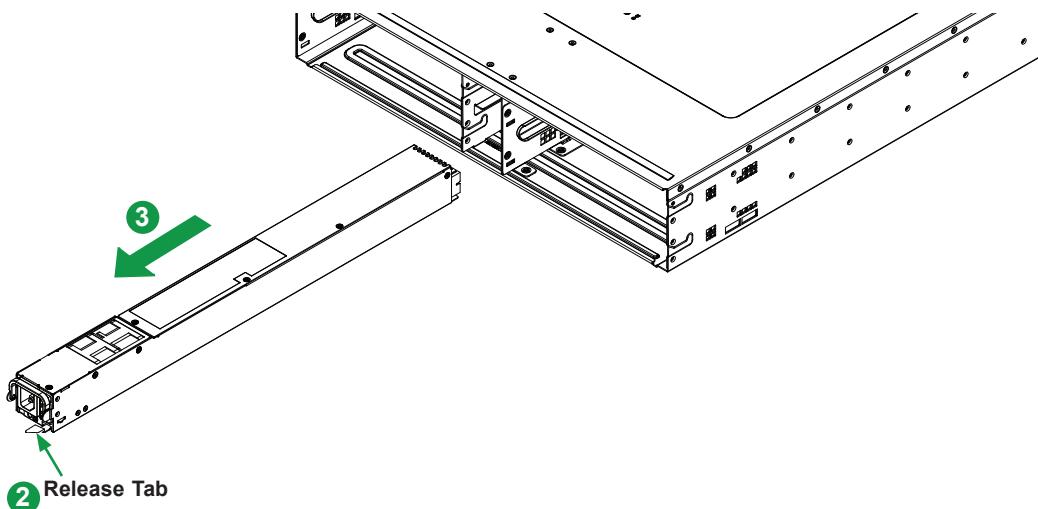
## 3.8 Power Supply

The chassis features redundant power supplies. The power modules 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. An amber light will be illuminated on the power supply when the power is off. An illuminated green light indicates that the power supply is operating.

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

1. Unplug the AC cord from the module to be replaced.
2. Push the release tab on the back of the power supply as illustrated.



**Figure 3-20. Power Supply Release Tab**

3. Pull the power supply out using the handle provided.
4. Replace the failed power module with the same model.
5. Push the new power supply module into the power bay until it clicks.
6. Plug the AC power cord back into the module.

## 3.9 Cable Routing Diagram

Refer to the diagram below for a representation of how the storage cables are routed through the node. When disconnecting cables to add or replace components, refer to this diagram so you can reroute them in the same manner.

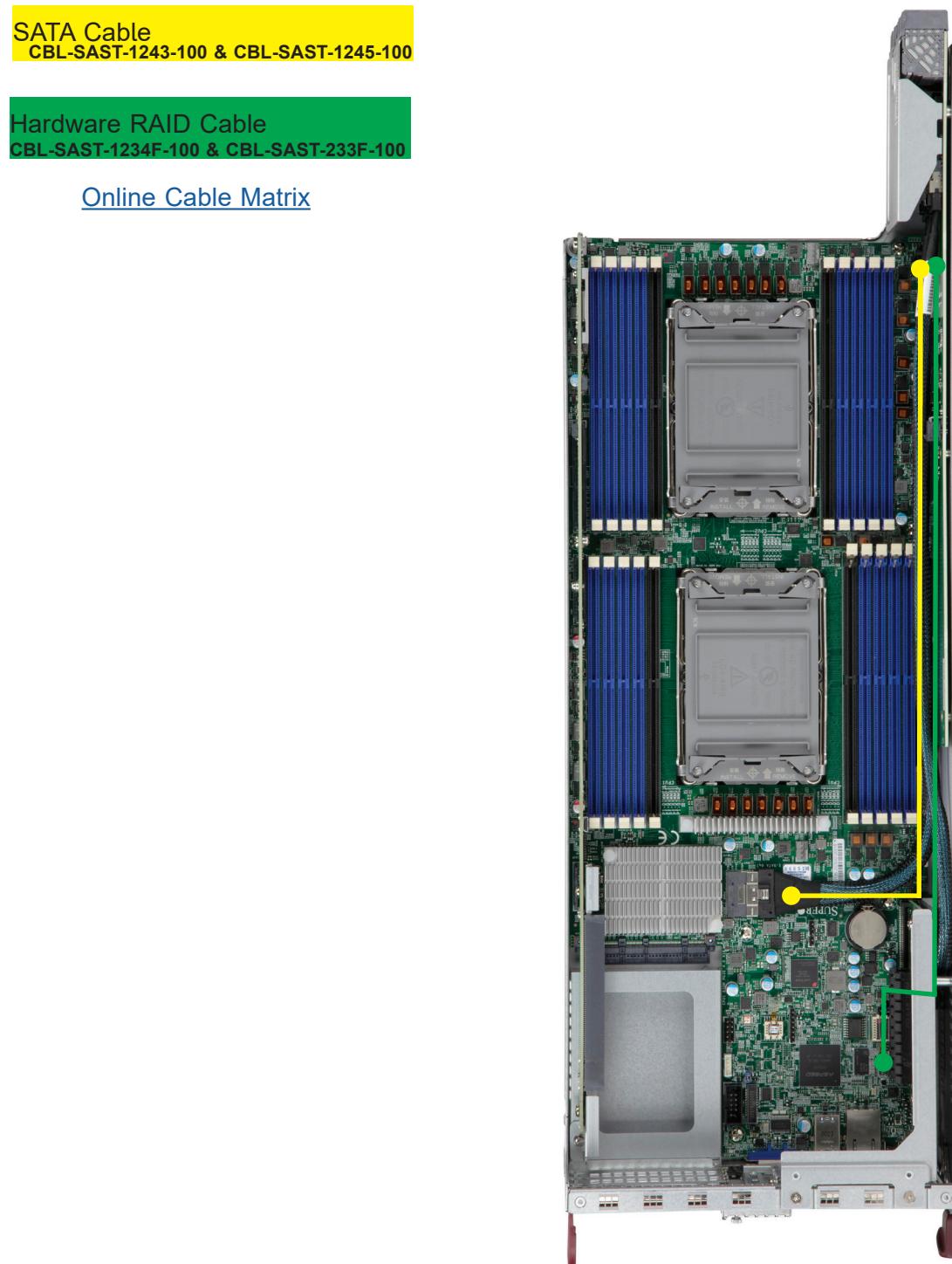


Figure 3-21. Cable Routing Diagram

## 3.10 BMC Reset

The BMC can be reset using the UID button.

- Reset – Press and hold the button. After six seconds, the LED blinks at 2Hz. The BMC resets and the reset duration is ~250 ms. Then the BMC starts to boot.
- Restore factory default configuration – Hold the button for twelve seconds. The LED blinks at 4Hz while the defaults are configured. **Note:** All BMC settings including username and password will be removed except the FRU and network settings.

Firmware update – When the BMC firmware is being updated, the UID LED blinks at 10Hz.

BMC Reset Options		
Event	UID LED	BMC Heartbeat LED
Reset	Blue, Blinks at 2Hz	Green, solid
Restore Defaults	Blue, Blinks at 4Hz	Off
Update	Blue, Blinks at 10Hz	

# 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](#). More detail can be found in the [Motherboard Manual](#).

Please review the Safety Precautions in [Appendix A](#) before installing or removing components.

### 4.1 Power Connections

#### Power Supply Connectors

There are four 6-pin 12V DC power connectors (JPWR1/JPWR2/JPWR3/JPWR4) on the motherboard to provide adequate power supply to your system.

12V 6-pin Power Pin Definitions	
Pin#	Definition
1 - 3	Ground
4 - 6	+12V

## 4.2 Headers and Connectors

### Fan Headers

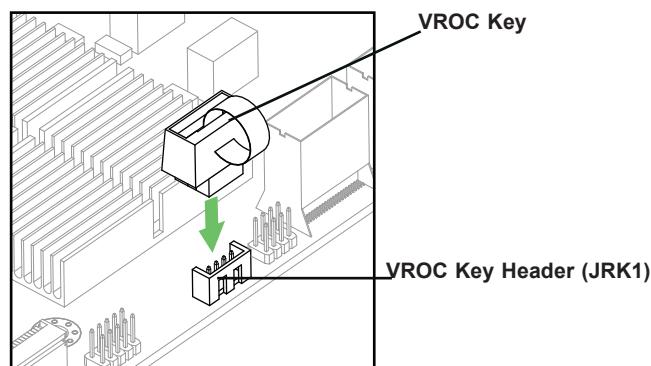
There are four 4-pin fan headers on the motherboard: two (FAN3~FAN4) on the front plane (see locations below), and two (FAN1~FAN2) on the HDD backplane. All these 4-pin fan headers are backwards compatible with the traditional 3-pin fans. However, fan speed control is available for 4-pin fans only by Thermal Management via the BMC interface. Refer to the table below for pin definitions.

Fan Header Pin Definitions	
Pin#	Definition
1	Ground
2	2.5A/+12V
3	Tachometer
4	PWM_Control

### VROC RAID Key Header

A VROC RAID Key header is located at JRK1 on the motherboard. Install a VROC RAID Key on JRK1 for NVMe RAID support as shown in the illustration below. Please refer to the layout below for the location of JRK1.

Intel VROC Key Pin Definitions	
Pin#	Definition
1	Ground
2	3.3V Standby
3	Ground
4	PCH RAID Key



**Note:** The graphics contained in this user's manual are for illustration only. The components installed in your system may or may not look exactly the same as the graphics shown in the manual.

### TPM/Port 80 Header

The JTPM1 header is used to connect a Trusted Platform Module (TPM)/Port 80, which is available from Supermicro (optional). A TPM/Port 80 connector is a security device that supports encryption and authentication in hard drives. It allows the motherboard to deny access if the TPM associated with the hard drive is not installed in the system. See the layout below for the location of the TPM header. Please go to the following link for more information on the TPM: <http://www.supermicro.com/manuals/other/TPM.pdf>.

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

### NCSI Connector

The NCSI header (JNCSI) is used to connect a Network Interface Card (NIC) to the motherboard so that the BMC is able to poll the temperature reading from it.

**Note:** For detailed instructions on how to configure Network Interface Card (NIC) settings, please refer to the Network Interface Card Configuration User's Guide posted on the web page under the link: <http://www.supermicro.com/manuals/>.

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

The X12DPT-B6 has eight I-SATA 3.0 ports (I-SATA0~7) and six S-SATA ports (S-SATA0-1, S-SATA2~5). These SATA ports, supported by the C621A chipset, provide serial-link signal connections.

## 4.3 Input/Output Ports

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



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

Rear I/O Ports			
#	Description	#	Description
1	VGA Port	3	Dedicated BMCLAN
2	USB0/1 (3.0)	4	UID Switch

### VGA Connection

The VGA port is located at JVGA1 on the front I/O panel. The VGA connection provides analog interface support between the computer and the video displays. Refer to the layout below for the location of the VGA connection.

### COM Port

The COM (communication) port (COM1) supports serial link interface. Refer to the layout below for the location of the COM port.

### BMC LAN Port

The BMC dedicated LAN (BMC\_LAN1), provides LAN support for the BMC (Baseboard Management Controller). Please refer to the LED Indicator section for LAN LED information.

### Universal Serial Bus (USB) Ports and Headers

An 18-pin USB connector, located on the rear I/O panel, supports two USB 3.0 ports (USB0/1) via USB cables.

Rear I/O Panel USB0/1 (3.0) Pin Definitions			
Pin#	Definition	Pin#	Definition
A1	VBUS	B1	Power
A2	D-	B2	USB_N
A3	D+	B3	USB_P
A4	GND	B4	GND
A5	Stda_SSRX-	B5	USB3_RN
A6	Stda_SSRX+	B6	USB3_RP
A7	GND	B7	GND
A8	Stda_SSTX-	B8	USB3_TN
A9	Stda_SSTX+	B9	USB3_TP

### UID (Unit Identification)/BMC Reset Switch and UID/BMC Reset LED Indicators

A UID LED/BMC Reset switch (JUIDB1) is located on the rear side of the motherboard. This switch has dual functions. It can be used to identify a system unit that is in need of service, and it can also be used to reset the BMC settings.

When functioning as a UID LED switch, it can turn the UID LED (UID\_LED1) on and off to identify a unit that may require service.

When functioning as a BMC reset switch and working in conjunction with BMC Heartbeat LED (LED2), JUIDB1 will trigger a cold reboot when the user presses and holds the switch for 6 seconds. It will also restore the BMC to the manufacturer's default when the user presses and holds the switch for 12 seconds.

To achieve these dual purposes, the UID LED/BMC Reset switch works in conjunction with the BMC Heartbeat LED (LED2). Refer to the tables below for more details. Please note that UID can also be triggered via BMC on the motherboard. Refer to the BMC User's Guide posted on our website at <http://www.supermicro.com> for more information on BMC.

UID/BMC Reset Switch (JUIDB1) Features & Settings				
When Used as a UID LED Switch (works with UID_LED1)		When Used as a BMC Reset Switch (works with BMC Heartbeat LED (LED2))		
Color	Status	BMC Heartbeat LED	LED2	Green Blinking: BMC Normal
Blue: On	Unit Identified	BMC Reset: Press & hold the switch (JUIDB1) for 6 seconds	LED2: Solid green: during reboot	Triggering a cold reboot; LED: solid green on during cold reboot
Press the switch (JUIDB1) to turn on and off the UID LED.		BMC Reset: Press & hold the switch (JUIDB1) for 12 seconds	LED2: Solid green: during BMC reset	BMC: Reset to the manufacturer's default; LED: solid green on during BMC Reset

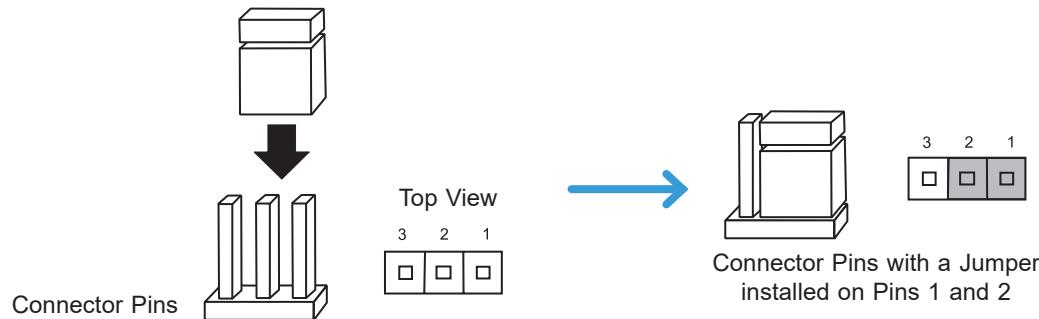
UID/BMC Reset Switch (JUIDB1) Pin Definitions	
Pin#	Definition
1	Ground
2	Ground
3	Button In
4	Button In

## 4.4 Jumpers

### How Jumpers Work

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

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



### 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 and remove the battery from the motherboard.
3. Short the CMOS pads with a metal object such as a small screwdriver for at least four seconds.
4. Remove the screwdriver (or shorting device).
5. Re-install the battery.
6. Replace the cover, reconnect the power cord(s), and power on the system.



**Note 1:** Clearing CMOS will also clear all passwords.

**Note 2:** Do not use the PW\_ON connector to clear CMOS.

## ME Recovery

JPME1 is used for ME Firmware Recovery mode, which will limit system resource for essential function use only without putting restrictions on power use. In the single operation mode, online upgrade will be available via Recovery mode. See the table below for pin definitions.

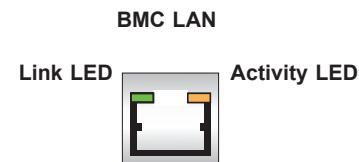
ME Recovery Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Normal (Default)
Pins 2-3	ME Recovery

## 4.5 LED Indicators

### BMC LAN LEDs

An BMC-dedicated LAN (BMC\_LAN1) is supported by the onboard Baseboard Management controller. The amber LED on the right indicates activity, while the LED on the left indicates the speed of the connection. Refer to the table below for more information.

BMC LAN LEDs		
	Color/State	Definition
Link (Left)	Green: Solid Amber: Solid	100 Mbps 1Gbps
Activity (Right)	Amber: Blinking	Active



### Unit ID LED

A rear UID LED indicator (UID\_LED1) is located next to the UID switch on the motherboard. This UID indicator provides easy identification of a system unit that may need service.

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

### BMC Heartbeat LED

A BMC Heartbeat LED is located at LED2 on the motherboard. When LED2 is blinking, the BMC is functioning normally. Refer to the table below for more information.

BMC Heartbeat LED Indicator	
LED Color	Definition
Green: Blinking	BMC Normal

# Chapter 5

## Software

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

### 5.1 Microsoft Windows OS Installation

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

#### *Installing the OS*

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

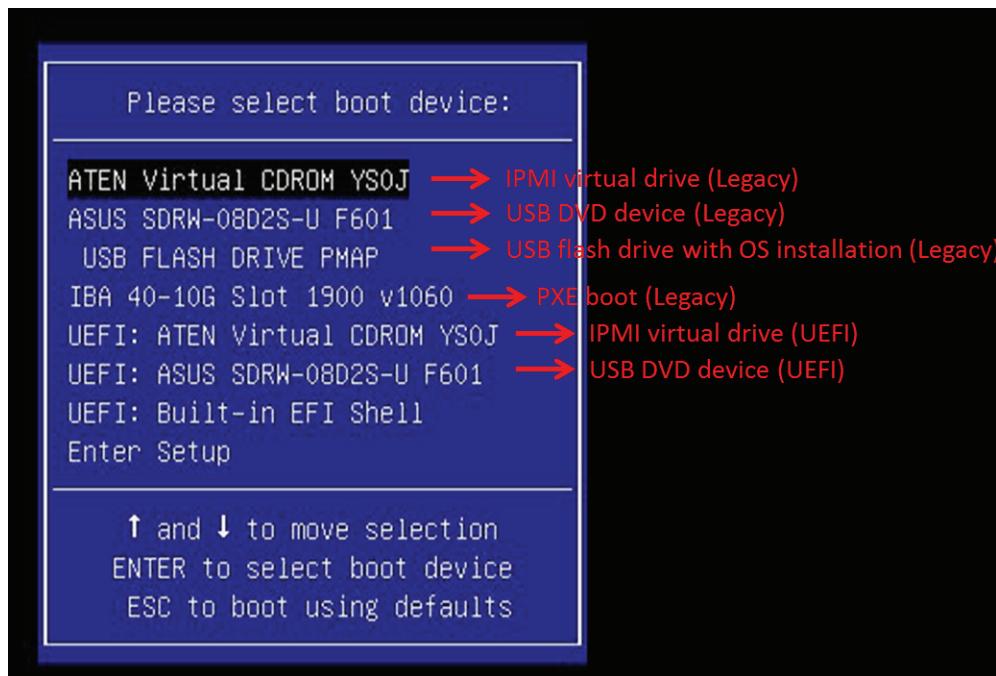
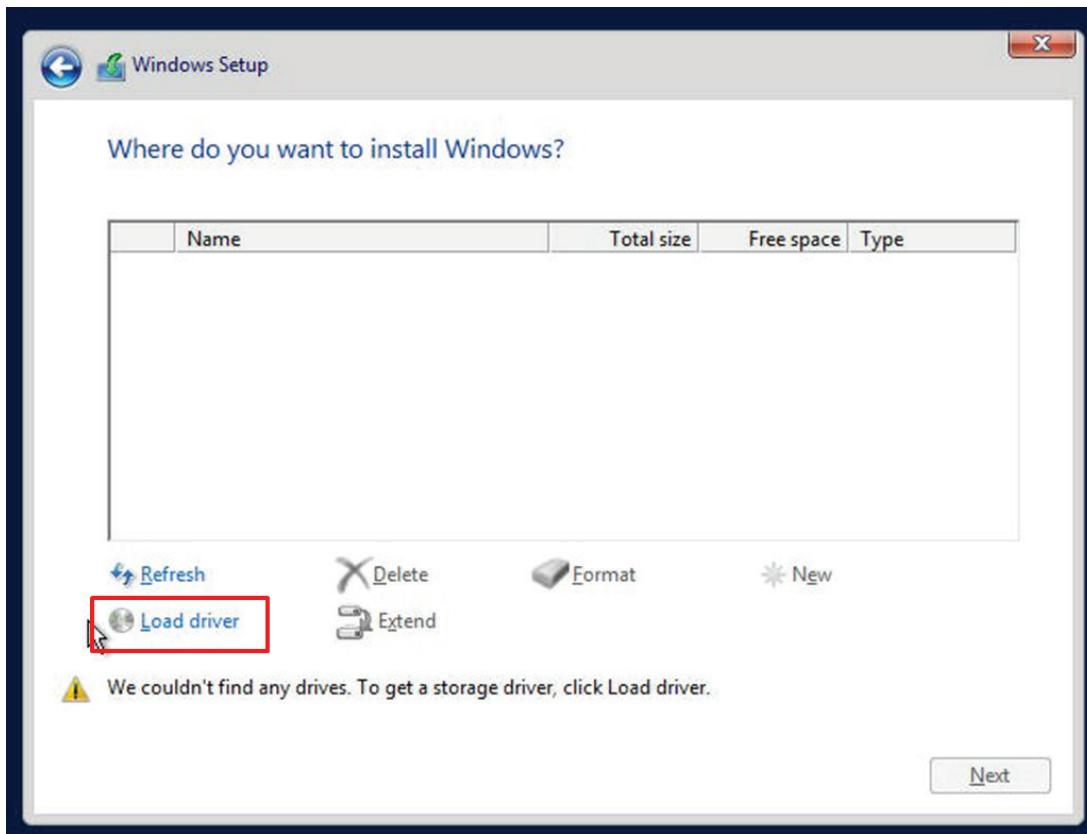


Figure 5-1. Select Boot Device

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



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

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

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

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

## 5.2 Driver Installation

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

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

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

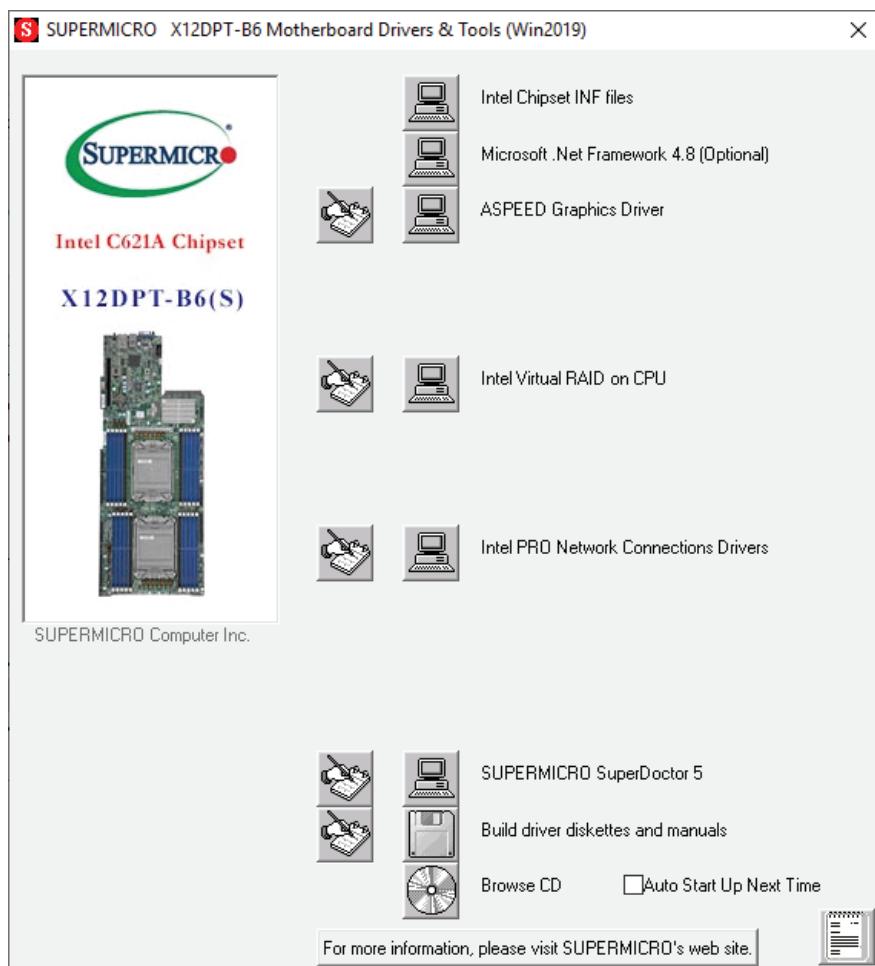


Figure 5-3. Driver & Tool Installation Screen

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

## 5.3 SuperDoctor® 5

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

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

### SuperDoctor® Manual and Resources

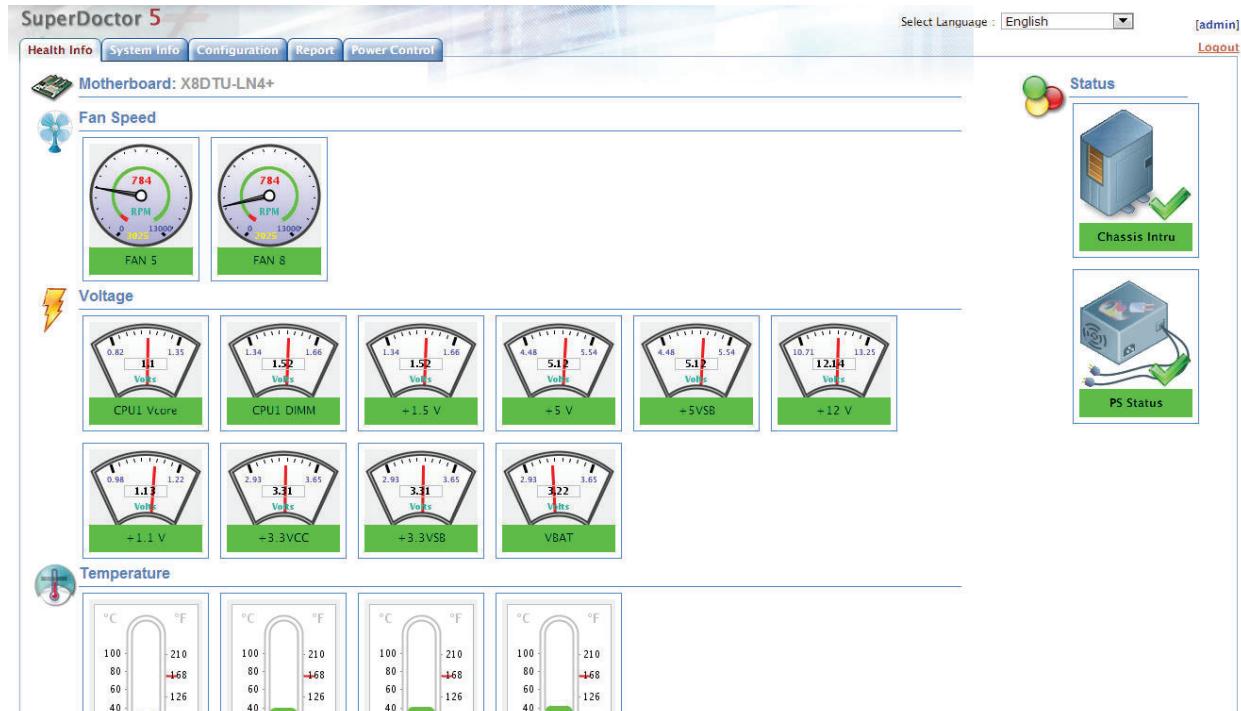


Figure 5-4. SuperDoctor 5 Interface Display Screen (Health Information)

## 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](http://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.



**Figure 5-5. BMC Password Label**

See the motherboard layout in Chapter 1 for the location of the label.

# Chapter 6

## Optional Components

This chapter describes optional system components and installation procedures.

### 6.1 Optional Parts List

Optional Parts List		
Description	Part Number	Quantity
M.2 NVMe HW RAID Controller Card	AOC-SMG3-2M2-B	1

### 6.2 M.2 NVMe Carrier Card

See [Chapter 3](#) Installing M.2 Carrier Card for steps to install the M.2 carrier card and SSDs.

### 6.3 GPU Support

The 220BT-DNTR and 220BT-DNC8R support up to two NVidia T4 GPUs per node. See [Chapter 3](#) Installing Expansion Cards for steps to install the NVidia T4 GPUs.

# Chapter 7

## Troubleshooting and Support

### 7.1 Information Resources

#### Website

A great deal of information is available on the Supermicro website, [supermicro.com](http://supermicro.com).



Figure 7-1. Supermicro Website

- Specifications for servers and other hardware are available by clicking the menu icon, then selecting the **Products** option.
- The **Support** option offers downloads (manuals, BIOS/BMC, drivers, etc.), FAQs, RMA, warranty, and other service extensions.

#### *Direct Links for the 220BT-D Series System*

[220BT-D Series specifications page](#)

X12DPT-B6 [motherboard page](#) for links to the Quick Reference Guide, User Manual, validated storage drives, etc.

[BPN-NVME4-217BHQ-S6 Backplane Manual](#)

#### *Direct Links for General Support and Information*

[Frequently Asked Questions](#)

[Add-on card descriptions](#)

[TPM User Guide](#)

General Memory Configuration Guide: [X12](#)

### Direct Links (continued)

[BMC User Guide](#)

[SuperDoctor5 Large Deployment Guide](#)

For validated memory, use our [Product Resources page](#)

[Product Matrices](#) page for links to tables summarizing specs for systems, motherboards, power supplies, riser cards, add-on cards, etc.

[Security Center](#) for recent security notices

[Supermicro Phone and Addresses](#)

## 7.2 Baseboard Management Controller (BMC)

The system supports the Baseboard Management Controller (BMC). BMC is used to provide remote access, monitoring and management. There are several BIOS settings that are related to BMC.

For general documentation and information on BMC, please visit our website at: <https://www.supermicro.com/en/solutions/management-software/bmc-resources>.

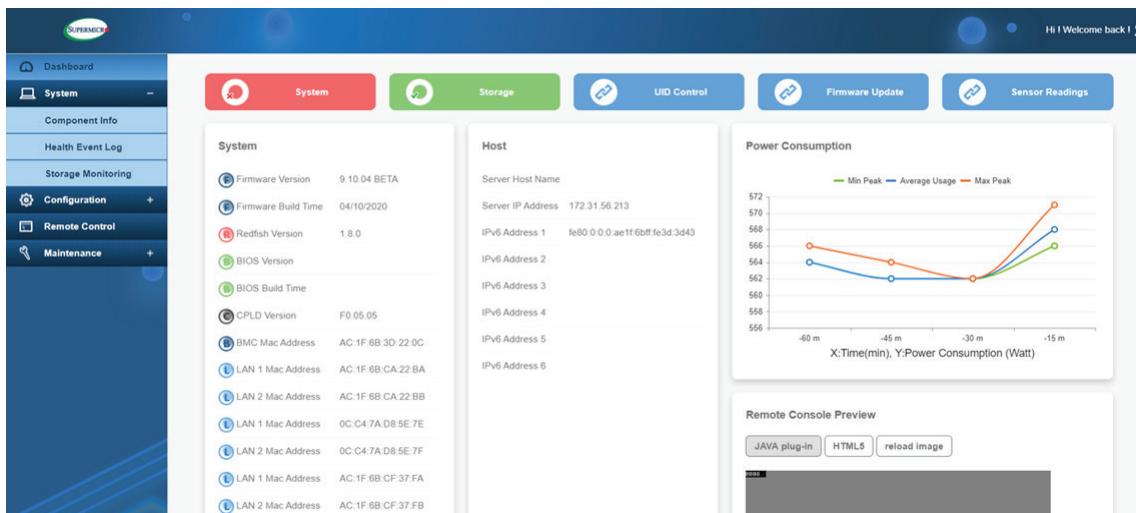


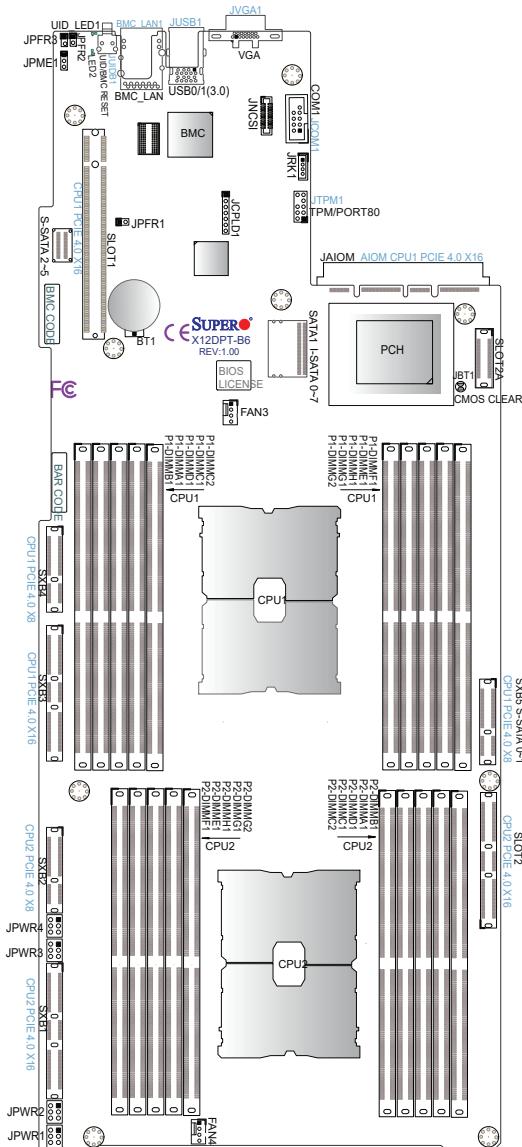
Figure 7-2. BMC Sample

## 7.3 Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the [Technical Support Procedures](#) or [Returning Merchandise for Service](#) section(s) in this chapter. [Power down](#) the system before changing any non hot-swap hardware components.

## No Power

1. Check that the power LED on the motherboard is on.
2. Make sure that the power connector is connected to your power supply.



**Figure 7-3. Location of the MB Power LED**

3. Make sure that no short circuits exist between the motherboard and chassis.
4. Disconnect all cables from the motherboard, including those for the keyboard and mouse.
5. Remove all add-on cards.
6. Install a CPU, a heatsink, connect the internal speaker (if applicable), and the power LED to the motherboard. Make sure that the heatsink is fully seated.
7. Use the correct type of onboard CMOS battery as recommended by the manufacturer. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.  
**Warning:** To avoid possible explosion, do not install the battery upside down.
8. Verify that all jumpers are set to their default positions.
9. Check that the power supplies' input voltage operate at 100-120V or 180-240V.
10. Turn the power switch on and off to test the system

## System Boot Failure

If the system does not display POST (Power-On-Self-Test) or does not respond after the power is turned on, check the following:

Turn on the system with only one DIMM module installed. If the system boots, check for bad DIMM modules or slots by following the Memory Errors Troubleshooting procedure below.

## Memory Errors

1. Make sure that the DIMM modules are properly and fully installed.
2. Confirm that you are using the correct memory. Also, it is recommended that you use the same memory type and speed for all DIMMs in the system. See [Section 3.4](#) for memory details.
3. Check for bad DIMM modules or slots by swapping modules between slots and noting the results.
4. Check the power supply voltage 115V/230V switch.

## Losing the System's Setup Configuration

1. Make sure that you are using a high quality power supply. A poor quality power supply may cause the system to lose the CMOS setup information. .
2. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

3. If the above steps do not fix the setup configuration problem, contact your vendor for repairs.

## When the System Becomes Unstable

***If the system becomes unstable during or after OS installation, check the following:***

1. CPU/BIOS support: Make sure that your CPU is supported and that you have the latest BIOS installed in your system.
2. Memory support: Make sure that the memory modules are supported by testing the modules using memtest86 or a similar utility.
3. HDD support: Make sure that all hard disk drives (HDDs) work properly. Replace the bad HDDs with good ones.
4. System cooling: Check the system cooling to make sure that all heatsink fans and CPU/system fans, etc., work properly. Check the hardware monitoring settings in the BMC to make sure that the CPU and system temperatures are within the normal range. Also check the front panel Overheat LED and make sure that it is not on.
5. Adequate power supply: Make sure that the power supply provides adequate power to the system. Make sure that all power connectors are connected. Please refer to our website for more information on the minimum power requirements.
6. Proper software support: Make sure that the correct drivers are used.

***If the system becomes unstable before or during OS installation, check the following:***

1. Source of installation: Make sure that the devices used for installation are working properly, including boot devices such as CD.
2. Cable connection: Check to make sure that all cables are connected and working properly.
3. Using the minimum configuration for troubleshooting: Remove all unnecessary components (starting with add-on cards first), and use the minimum configuration (but with a CPU and a memory module installed) to identify the trouble areas. Refer to the steps listed in [Section 7.3](#) above for proper troubleshooting procedures.
4. Identifying bad components by isolating them: If necessary, remove a component in question from the chassis, and test it in isolation to make sure that it works properly. Replace a bad component with a good one.

5. Check and change one component at a time instead of changing several items at the same time. This will help isolate and identify the problem.
6. To find out if a component is good, swap this component with a new one to see if the system will work properly. If so, then the old component is bad. You can also install the component in question in another system. If the new system works, the component is good and the old system has problems.

## 7.4 Crash Dump Using BMC

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 BMC. The BMC manual is available at <https://www.supermicro.com/en/solutions/management-software/bmc-resources>.

### Check BMC Error Log

1. Access the BMC web interface.

Severity	Date/Time	Sensor Type Categories	Description	Event Type
Yellow	2020-10-15 18:57:06	ACPowerOn	[ OEM ] First AC Power on - Assertion	Sensor-specific
Green	2020-10-15 18:56:43	System NIC	[ OEM ] Dedicated LAN Link Up - Assertion	Sensor-specific
Yellow	2020-10-15 17:41:37	ACPowerOn	[ OEM ] First AC Power on - Assertion	Sensor-specific
Green	2020-10-15 17:41:17	System NIC	[ OEM ] Dedicated LAN Link Up - Assertion	Sensor-specific
Yellow	2020-10-15 17:41:14	System NIC	[ OEM ] Dedicated LAN Link Down - Assertion	Sensor-specific
Green	2020-10-15 17:41:12	System NIC	[ OEM ] Dedicated LAN Link Up - Assertion	Sensor-specific

Figure 7-4. BMC Event Log

2. Click the **Server Health** tab, then **Event Log** to verify an IERR error.

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

## 7.5 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.

### 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.

### 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/info/SMS\\_SUM.cfm](https://www.supermicro.com.tw/products/info/SMS_SUM.cfm)) to reflash the BIOS.

### Recovering the Main BIOS Block with a USB Device

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

The file system supported by the recovery block is FAT (including FAT12, FAT16, and FAT32) which is installed on a bootable or non-bootable USB-attached device. However, the BIOS might need several minutes to locate the SUPER.ROM file if the media size becomes too large due to the huge volumes of folders and files stored in the device.

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

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

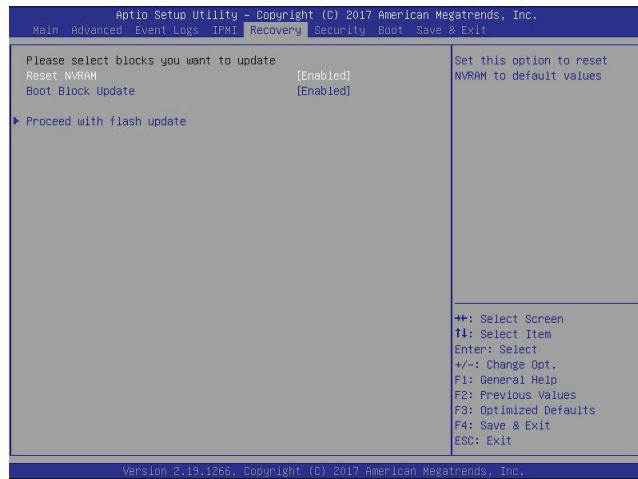
**Note 1:** If you cannot locate the "Super.ROM" file in your drive disk, visit our website at [www.supermicro.com](http://www.supermicro.com) to download the BIOS package. Extract the BIOS binary image into a USB flash device and rename it "Super.ROM" for the BIOS recovery use.

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

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



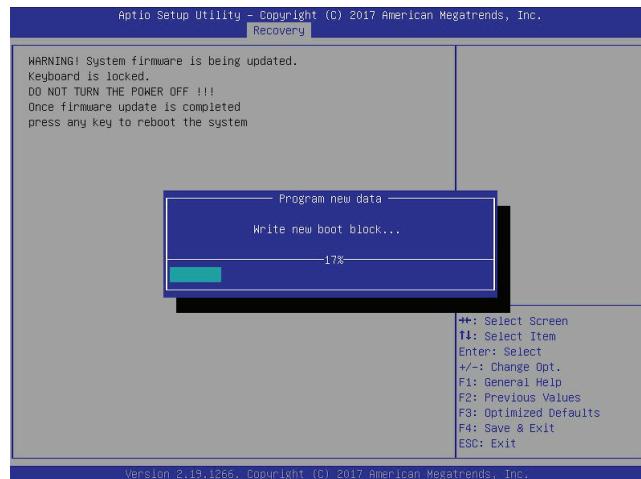
**Note:** At this point, you may decide if you want to start the BIOS recovery. If you decide to proceed with BIOS recovery, follow the procedures below.



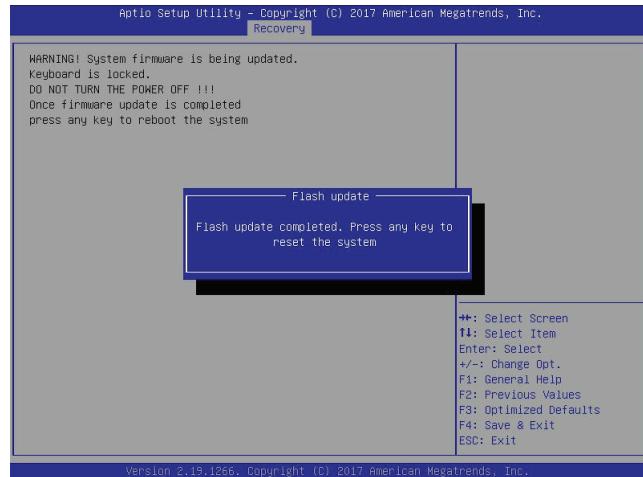
- When the screen as shown above displays, use the arrow keys to select the item "Proceed with flash update" and press the <Enter> key. You will see the BIOS recovery progress as shown in the screen below.

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

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

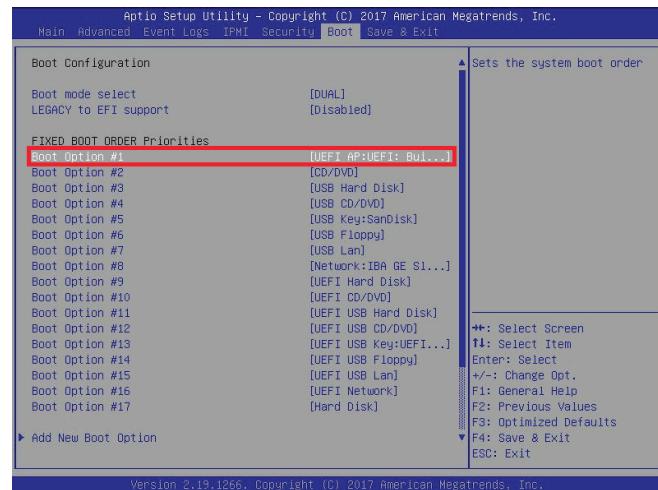


7. Press **<Del>** continuously during system boot to enter the BIOS Setup utility. From the top of the tool bar, select Boot to enter the submenu. From the submenu list, select Boot

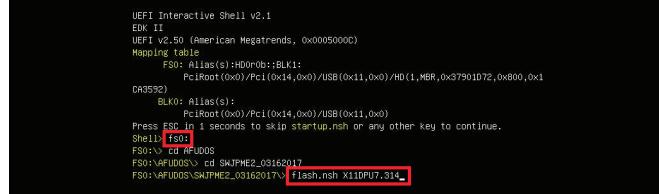


Option #1 as shown below. Then, set Boot Option #1 to [UEFI AP:UEFI: Built-in EFI Shell]. Press **<F4>** to save the settings and exit the BIOS Setup utility.

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



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

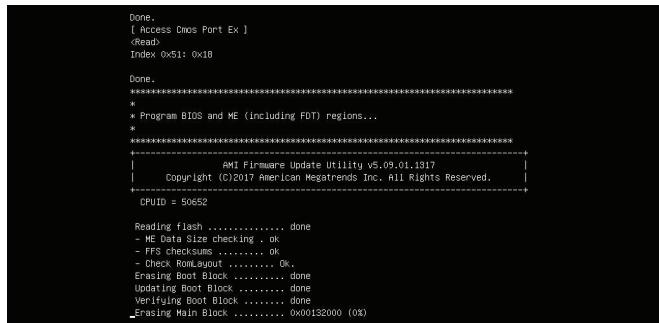


```

UEFI Interactive Shell v2.1
EDK II
UEFI v2.50 (American Megatrends, 0x0005000C)
Mapping table
  FS0: Alias(s):+00r0b::BLK1:
    PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)/HD(1,MBR,0x37901072,0x800,0x1
049592)
  BLK0: Alias(s):
    PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)
Press ESC in 1 seconds to skip startup.nsh or any other key to continue.
Shell1> fs0:
Shell1> cd \FUDOS
FS0:\FUDOS> cd \SJMPE2_03162017
FS0:\FUDOS\SJMPE2_03162017> flash.nsh X10PDU7.314

```

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



```

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

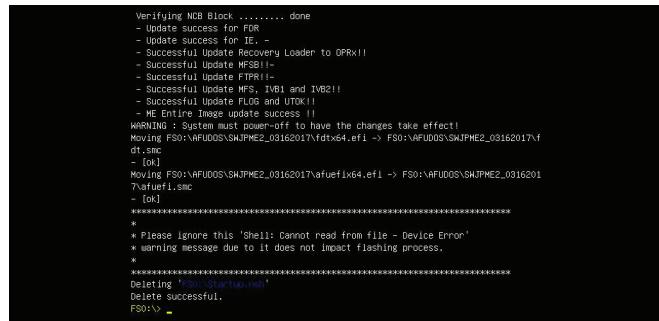
Done.
*****
* Program BIOS and ME (including FOT) regions...
*
*****
| AMI Firmware Update Utility v5.09.01.1317
| copyright (C)2017 American Megatrends Inc. All Rights Reserved.
|
+-----+
CRVID = 50652

Reading Flash ..... done
- ME Data Size checking .. ok
- FFS checksums ..... ok
- Check RomLayout ..... ok
Erasing Main Block ..... done
Erasing Boot Block ..... done
Verifying Boot Block ..... done
Erasing Main Block ..... (0%) (0%)

```

the AC power cable in the power supply again to power on the system.

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



```

Verifying NCB Block ..... done
- Update success for FDR
- Update success for IE, -
- Successful update Recovery Loader to OPRx11
- Successful update MFSB1!
- Successful update FTRP1!
- Successful update MFS, IVB1 and IVB2!
- Successful update FLOG and UTK1!
- ME Data Size checking .. ok
WARNING : System must power-off to have the changes take effect!
Moving FS0:\FUDOS\SJMPE2_03162017\fdtx64.efi -> FS0:\FUDOS\SJMPE2_03162017\f
dt.smc
- [ok]
Moving FS0:\FUDOS\SJMPE2_03162017\afuefix64.efi -> FS0:\FUDOS\SJMPE2_0316201
7\afuei1.smc
- [ok]
*****
* Please ignore this 'Shell: Cannot read from file - Device Error'
* warning message due to it does not impact flashing process.
*
*****
Delete "fs0:\startuo.nsh"
Delete successful.
FS0:\>

```

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.

## 7.6 CMOS Clear

GBT1 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 completely.
2. [Remove](#) node from 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. Re-install the battery.
7. Replace the cover, reconnect the power cords and power on the system.

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

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



## 7.7 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" tab.

## 7.8 Reporting an Issue

### Technical Support Procedures

Before contacting Technical Support, please take the following steps. If your system was purchased through a distributor or reseller, please contact them for troubleshooting services. They have the best knowledge of your specific system configuration.

1. Please review the [Troubleshooting Procedures](#) in this manual and [Frequently Asked Questions](#) on our website before contacting Technical Support.
2. BIOS upgrades can be downloaded from our website. **Note:** Not all BIOS can be flashed depending on the modifications to the boot block code.
3. If you still cannot resolve the problem, include the following information when contacting us for technical support:
  - System, motherboard, and chassis model numbers and PCB revision number
  - BIOS release date/version (this can be seen on the initial display when your system first boots up)
  - System configuration

An example of a Technical Support form is posted on our [website](#). Distributors: For immediate assistance, please have your account number ready when contacting our technical support department by email.

### 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.

## **Vendor Support Filing System**

For issues related to Intel, use the Intel IPS filing system:

<https://www.intel.com/content/www/us/en/design/support/ips/training/welcome.html>

For issues related to Red Hat Enterprise Linux, since it is a subscription based OS, contact your account representative.

## **7.9 Feedback**

Supermicro values your feedback as we strive to improve our customer experience in all facets of our business. Please email us at [techwriterteam@supermicro.com](mailto:techwriterteam@supermicro.com) to provide feedback on our manuals.

## Appendix A

# 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](http://www.supermicro.com/about/policies/safety_information.cfm).

### Warning Definition



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

警告の定義

この警告サインは危険を意味します。

人身事故につながる可能性がありますので、いずれの機器でも動作させる前に、電気回路に含まれる危険性に注意して、標準的な事故防止策に精通して下さい。

此警告符号代表危险。

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

此警告符號代表危險。

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

## Warnung

### WICHTIGE SICHERHEITSHINWEISE

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

BEWAHREN SIE DIESE HINWEISE GUT AUF.

### INSTRUCCIONES IMPORTANTES DE SEGURIDAD

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

GUARDE ESTAS INSTRUCCIONES.

### IMPORTANTES INFORMATIONS DE SÉCURITÉ

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

CONSERVEZ CES INFORMATIONS.

תקנון הצהרות אזהרה

הצהרות הבאות הן אזהרות על פי התקני התעשייה, על מנת להזהיר את המשתמש מפני חבלה פיזית אפשרית. במידה ויש שאלות או היתקלות בעיה כלשהי, יש ליצור קשר עם מחלקת תמייה טכנית של סופרמייקרו. טכנאים מוסמכים בלבד רשאים להתקין או להגדיר את הרכיבים. יש לקרוא את הנספח במלואו לפני התקנת או הגדרת הרכיבים במאזן סופרמייקרו.

اًكَّ فَحَالَةٌ وُكِيَّ أَيْ تَتَسَبَّبُ فِي اصَابَةٍ جَسْدَهُ هَذَا الْزَهْزَعُ عُ خَطْرٌ! تَحْذِيرٌ .  
 قَبْلَ أَيْ تَعْوِلَ عَلَى أَيْ هَعْدَاتٍ، كَيْ عَلَى عَلَنْ بِالْوَخَاطِرِ الْأَجْوَهَ عَيْ الْذَوَائِزِ  
 الْكَهْزَبَائِيَّهِ  
 وَكَيْ عَلَى دَرَاهُ بِالْوَوَارِسَاتِ الْقَائِيَّهِ لَوْعُ وَقَعَ أَيْ حَادِثٌ  
 اسْتَخْدِمْ رَقْنَ الْبِيِّ الْوَصْصَ فَهَاهُ كُلَّ تَحْذِيرٍ لِلْعَشْرِ تَرْجُوتَهَا

### 안전을 위한 주의사항

#### 경고!

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

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

### BELANGRIJKE VEILIGHEIDSINSTRUCTIES

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

### BEWAAR DEZE INSTRUCTIES

### Installation Instructions



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

### 設置手順書

システムを電源に接続する前に、設置手順書をお読み下さい。

### 警告

将此系统连接电源前,请先阅读安装说明。

### 警告

將系統與電源連接前，請先閱讀安裝說明。

### Warnung

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

### ¡Advertencia!

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

### Attention

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

יש לקרוא את הוראות התקינה לפני חיבור המערכת למקור מתח.

اقر إرشادات التركيب قبل توصيل النظام إلى مصدر للطاقة

시스템을 전원에 연결하기 전에 설치 안내를 읽어주십시오.

### Waarschuwing

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

## Circuit Breaker



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

### サーキット・ブレーカー

この製品は、短絡(過電流)保護装置がある建物での設置を前提としています。

保護装置の定格が250 V、20 Aを超えないことを確認下さい。

### 警告

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

### 警告

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

**Warnung**

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

**¡Advertencia!**

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

**Attention**

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

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

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

**경고!**

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

**Waarschuwing**

Dit product is afhankelijk van de kortsluitbeveiliging (overspanning) van uw electrische installatie. Controleer of het beveiligde apparaat niet groter gedimensioneerd is dan 250V, 20A.

**Power Disconnection Warning**

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



**電源切断の警告**

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

**警告**

在你打开机箱并安装或移除内部器件前,必须将系统完全断电,并移除电源线。

**警告**

在您打開機殼安裝或移除內部元件前，必須將系統完全斷電，並移除電源線。

**Warnung**

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

**¡Advertencia!**

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

**Attention**

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

ازהרה מפני ניתוק חשמלי!  
!ازהרה!

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

يجب فصل انظاوا من جميع مصادر انطاقت وإزانت سهك انكهرباء من وحدة امداد  
انطاقت قبم  
انفصل إني انمناطق انداخهيت نههيكم نتشبيج أو إزانت مكناث الجهاز

경고!

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

Waarschuwing

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

## Equipment Installation



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

機器の設置

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

警告

只有经过培训且具有资格的人员才能进行此设备的安装、更换和维修。

警告

只有經過受訓且具資格人員才可安裝、更換與維修此設備。

Warnung

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

¡Advertencia!

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

**Attention**

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

אזהרה!

צוות מוסמך בלבד רשאי להתקין, להחליפּ את הציוד או לחת שירות עבור הציוד.

وال مدربين لتزكيب واستبدال أو خدمة هذا الجهاز يجب أن يسمح فقط للموظفيه المؤهلين

**경고!**

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

**Waarschuwing**

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

## Restricted Area



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

**アクセス制限区域**

このユニットは、アクセス制限区域に設置されることを想定しています。

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

**警告**

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

**警告**

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

### Warnung

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

### ¡Advertencia!

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

### Attention

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

אזור עם גישה מוגבלת  
ゾーハה!

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

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

### 경고!

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

### Waarschuwing

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

## Battery Handling



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

### 電池の取り扱い

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

### 警告

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

### 警告

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

### Warnung

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

### Attention

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

### ¡Advertencia!

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

### אזהרה!

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

هناك خطر من انفجار في حالة اسحذال البطارية بطريقة غير صحيحة فعليل  
اسحذال البطارية

فقط بنفس النوع أو ما يعادلها مما أوصى به الشرمة المصنعة  
جخلص من البطاريات المسحعملة وفقا لتعليمات الشرمة الصانعة

경고!

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

Waarschuwing

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

## Redundant Power Supplies



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

冗長電源装置

このユニットは複数の電源装置が接続されている場合があります。

ユニットの電源を切るためには、すべての接続を取り外さなければなりません。

警告

此部件连接的电源可能不止一个，必须将所有电源断开才能停止给该部件供电。

警告

此裝置連接的電源可能不只一個，必須切斷所有電源才能停止對該裝置的供電。

Warnung

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

### ¡Advertencia!

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

### Attention

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

אם קיים יותר מספק אחד  
אוורה!

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

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

### 경고!

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

### Waarschuwing

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

## Backplane Voltage



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

バックプレーンの電圧

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

修理する際には注意ください。

警告

当系统正在进行时，背板上有很危险的电压或能量，进行维修时务必小心。

警告

當系統正在進行時，背板上有危險的電壓或能量，進行維修時務必小心。

Warnung

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

¡Advertencia!

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

Attention

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

מתה בפנל האחורי

אוֹהֶרֶה!

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

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

경고!

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

Waarschuwing

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

## Comply with Local and National Electrical Codes



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

地方および国の電気規格に準拠

機器の取り付けはその地方および国の電気規格に準拠する必要があります。

警告

设备安装必须符合本地与本国电气法规。

警告

設備安裝必須符合本地與本國電氣法規。

Warnung

Die Installation der Geräte muss den Sicherheitsstandards entsprechen.

¡Advertencia!

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

Attention

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

תיאום חוקי החשמל הארצי

אוורה!

התקנת הציוד חייבת להיות תואמת לחוקי החשמל המקומיים והלאומיים.

تركيب المعدات الكهربائية يجب أن يمتثل للقوانين المحلية والدولية المتعلقة بالكهرباء.

경고!

현 지역 및 국가의 전기 규정에 따라 장비를 설치해야 합니다.

Waarschuwing

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

## Product Disposal



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

製品の廃棄

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

警告

本产品的废弃处理应根据所有国家的法律和规章进行。

警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

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

¡Advertencia!

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

**Attention**

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

סילוק המוצר

ازהרה!

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

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

경고!

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

**Waarschuwing**

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

**Hot Swap Fan Warning**

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

ファン・ホットスワップの警告

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

警告!

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

警告

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

## Warnung

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

## ¡Advertencia!

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

## Attention

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

## ازهرا!

חלקים נייחים מסוכנים. התרחק מלהבי המא Orr בפעולת הכח מסירם את חלקו המא Orr מהמארז, יתכן והמא Orrים עדיין עובדים. יש להרחק למרחק בטוח את הא צבעות וכל עבודה שונות מהפתחים בתוך המא Orr

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

## 경고!

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

## Waarschuwing

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

## Power Cable and AC Adapter



**Warning!** When installing the product, use the provided or designated connection cables, power cables and AC adaptors. Using any other cables and adaptors could cause a malfunction or a fire. Electrical Appliance and Material Safety Law prohibits the use of UL or CSA -certified cables (that have UL/CSA shown on the 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 Adapter, die Ihre örtlichen Sicherheitsstandards einhalten. Der Gebrauch von anderen Kabeln und Adaptern können Fehlfunktionen oder Feuer verursachen. Die Richtlinien untersagen das Nutzen von UL oder CAS zertifizierten Kabeln (mit UL/CSA gekennzeichnet), an Geräten oder Produkten die nicht mit Supermicro gekennzeichnet sind.

**¡Advertencia!**

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

**Attention**

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

AC ימאתו סילבך סילבך  
הרזה!

רוצל ומאותה וא שכרנו רשא AC סימאתמו מיקפו, סילבכ שמתshall שי, רצומה תא מיניקתם רשאכ לבב שומיש. עקתו לבכה לש הנוכנ הדימ לLOC, תויומקמה תוחיתבה תושירדל ומאותה רשאו, הנקתתה לשחה ירישכמב שומישה י��וחל מאתהב. ילםשה רצק וא הלקטל סורגל לולע, רחא גוסם מאטם וא לבכ לש דוק מהילע עיפומ רשאכ) A-ב ו-A UL -ב סיכמסומה סילבכ שמתshall רוסיא מיק, תוחיתבה י��וחו. דבלב Supermicro י"ע מאותה רשא רצומב קר אלא, רחא ילםשה רצום לכ חובע (UL/CSA).

تالب اكلا ءارشب مق وأ قدحـملـا وـأـ قـرفـوتـملـاـ تـالـيـصـوـتـلـاـ مـادـخـتـسـابـ مقـ ،ـجـتنـمـلـاـ بـيـكـرـتـ دـنـعـ  
كلـذـ يـفـ اـمـبـ ئـيـلـحـمـلـاـ قـمـالـسـلـاـ تـابـلـطـتـمـوـ نـيـنـاـوـقـبـ مـازـتـلـالـاـ عـمـ دـدـرـتـمـلـاـ رـايـتـلـاـ رـايـتـلـاـ رـايـتـلـاـ  
قـيـرـحـ وـأـ لـطـعـ يـفـ بـبـسـتـيـ دـقـ ئـرـخـأـ تـالـوـحـمـوـ تـالـبـاـكـ يـأـ مـادـخـتـسـاـ.ـمـيـلـسـلـاـ سـبـاـقـلـاوـ لـصـوـمـلـاـ مـجـحـ  
وـأـ ULـ لـبـقـ نـمـ قـدـمـتـعـمـلـاـ تـالـبـاـكـلـاـ مـادـخـتـسـاـ تـادـعـمـلـاوـ ئـيـأـبـرـهـكـلـاـ قـزـهـجـأـلـلـ قـمـالـسـلـاـ نـونـاـقـ رـظـحـيـ  
Supermicroـ لـبـقـ نـمـ قدـحـمـلـاوـ ئـيـنـعـمـلـاـ تـاجـتـنـمـلـاـ رـيـغـ ئـرـخـأـ تـادـعـمـ يـأـ عـمـ (UL/CSA)ـ قـمـالـعـ لـمـحـتـ يـتـلـاوـ

### 전원 케이블 및 AC 어댑터

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

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

### Stroomkabel en AC-Adapter

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

# Appendix B

## System Specifications

### Processors (per node)

Dual Intel Xeon Scalable Family 3rd Gen/4th Gen Series Processors (in Socket P+) with a thermal design power (TDP) of up to 270W and 3 UPIs (UltraPath Interconnect) of up to 11.2 GT/s per node.

Note: Refer to the motherboard specifications pages on our website for updates to supported processors.

### Chipset

Intel PCH C621A (LBG-R)

### BIOS

AMI BIOS

ACPI 3.0 or later, PCI firmware 4.0 support, BIOS rescue hot-key, SPI dual/quad speed support, riser card auto detection support, RTC (Real Time Clock) wakeup, and SMBIOS 3.0 or later

### Memory (per node)

16 DRAM DIMMs plus two PMem (Intel® Optane™ PMem 200 Series). Up to 4TB RDIMM, DDR4-3200MHz in 16 memory slots

### Storage Drives

Front hot-swappable drives include:

24 NVMe/SATA drives for 220BT-DNTR

24 NVMe/SAS/SATA drives for 220BT-DNC8R

Internal M.2 drives per node include:

Default carrier with two M.2 NVMe/SATA SSDs

Optional carrier with two M.2 NVMe SSDs and Marvell HW RAID

Internal Connector:

VROC key header

### PCI Expansion Slots (per node)

One PCIe 4.0 x16 slot

Two PCIe 4.0 x8 slots

### Networking (per node)

One AIOM or any compliant OCP 3.0 SFF Network Interface Card

One dedicated LAN port for BMC

### Input/Output (per node)

Two USB 3.0 ports

One VGA port

### Motherboard (per node)

X12DPT-B6 (WxL) 7.4" x 18.86" (187.96 mm x 479.04 mm)

### Chassis

CSE-217BD-R2K22P; 2U rackmount; (WxHxD) 17.6 x 3.5 x 28.8 in. (447 x 88 x 730 mm)

### System Cooling

Four 8-cm mid-chassis fans, two CPU heat sinks per node, and one air shroud per node

**Power Supply**

Model: PWS-2K22A-1R, 2200 W redundant module, 80Plus Titanium level

AC Input Voltages: 100-240 VAC

Rated Input Current:

1800W: 200-220Vac

1980W: 220-230Vac

2090W: 230-240Vac

2090W: 180-220Vac (for UL/cUL only)

2200W: 220-240Vac (for UL/cUL only)

2090W: 230-240Vdc (for CCC only)>

Rated Input Frequency: 50-60 Hz

Rated Output Power: +12 V

Max: 100A / Min: 0A (100-127Vac)

Max: 150A / Min: 0A (200-220Vac)

Max: 165A / Min: 0A (220-230Vac)

Max: 174.17A / Min: 0A (230-240Vac)

Max: 174.17A / Min: 0A (180-220Vac, UL/cUL only)

Max: 183.33A / Min: 0A (220-240Vac, UL/cUL only)

Max: 174.17A / Min: 0A (230-240Vdc, CCC only)

Standby +12Vsb: Max: 2.1A / Min: 0A

**Operating Environment**

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

Non-operating Temperature: -40° to 60° C (-40° to 140° F)

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

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

**Regulatory Compliance**

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

**Applied Directives, Standards**

EMC/EMI: 2014/30/EU (EMC Directive)  
Electromagnetic Compatibility Regulations 2016  
FCC Part 15 Subpart B  
ICES-003  
VCCI-CISPR 32  
AS/NZS CISPR 32  
EN/BS 55032  
EN/BS 55035  
CISPR 32  
CISPR 24/CISPR 35  
EN/BS 61000-3-2  
EN/BS 61000-3-3  
EN/BS 61000-4-2  
EN/BS 61000-4-3  
EN/BS 61000-4-4  
EN/BS 61000-4-5  
EN/BS 61000-4-6  
EN/BS 61000-4-8  
EN/BS 61000-4-11

Product Safety: 2014/35/EU (LVD Directive)  
UL/CSA 62368-1 (USA and Canada)  
Electrical Equipment (Safety) Regulations 2016  
IEC/EN/BS 62368-1

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

**Perchlorate Warning**

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

## Appendix C

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

### Supported SSDs and Operating Systems

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

## Additional Information

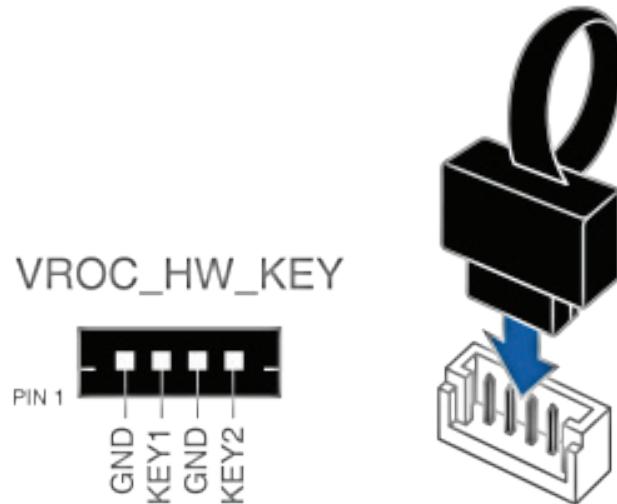
Additional information is available on the product page for the Supermicro add-on card and the linked manuals.

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

## C.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

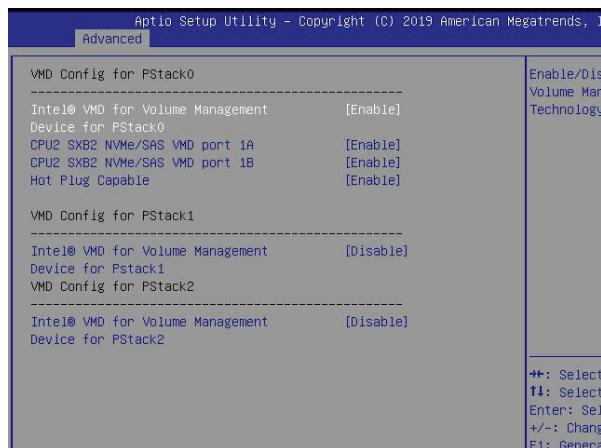


**Figure C-1. Intel® VROC RAID Key and Motherboard Connector JRK1**

## C.2 Enabling NVMe RAID

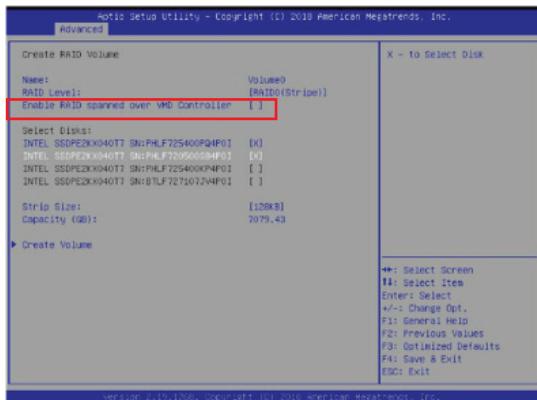
RAID for NVMe SSDs must be enabled through the UEFI BIOS.

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 > Intel VMD for Volume Management on CPU2**.
5. **Enable** the VMD.

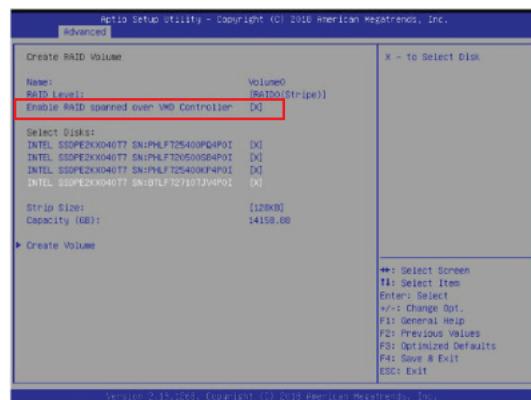


**Figure C-2. BIOS VMD Settings**

6. Press [F4] to save the configuration and reboot the system.
7. Press [DEL] to enter BIOS.
8. Switch to **Advanced > Intel® Virtual RAID on CPU > All Intel VMD Controllers > Create RAID Volume**.
9. Set **Name**.
10. Set **RAID Level**.



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



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

11. If cross-controller RAID is required, select **Enable RAID spanned over VMD Controller** as shown in Figure C-4.
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.

## C.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

## C.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>