SUPERMICRO®

SUPERSERVER®
SYS-620U-TNR

USER'S MANUAL

Revision 1.1a

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Manual Revision 1.1a

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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 SYS-620U-TNR 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: https://www.supermicro.com/support/manuals/

• Product drivers and utilities: https://www.supermicro.com/wdl

• Product safety info: https://www.supermicro.com/about/policies/safety_information.cfm

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

Secure Data Deletion

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

Warnings

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

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

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

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Chapter 3 Maintenance and Component Installation

Chapter 4 Motherboard Connections

Chapter 5 Software

Chapter 6 Optional Components

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Chapter 1

Introduction

1.1 Overview

This chapter provides a brief outline of the functions and features of the SuperServer SYS-620U-TNR. The following provides an overview of the specifications and capabilities.

System Overview	
Motherboard	X12DPU-6
Chassis	829U3TS-R1K22P-T
Processor Support	Dual P+ (LGA4189) sockets 3rd Gen Intel Xeon Scalable
Memory	32 DIMM slots, DDR4 RDIMM/LRDIMM or Intel Optane PMem 200 Series* (up to 8TB for DDR4, or up to 8TB of PMem and 4TB DDR4) Up to 3200MHz; size up to 256GB * Note: PMem 200 Series are supported on 3rd gen Intel Xeon Scalable Platinum, Gold and selected Silver processors.
Drive Support	Twelve 3.5" SATA/SAS/NVMe hybrid drive bays Two SuperDOM (disk on modules)

Expansion Slots	Eight PCIe 4.0:
	  Five x8 full-height, 10.5"
	  One x16 full-height, 10.5"
	  One x16 low profile
	  One internal x8 low-profile

I/O Ports	LAN ports depend on Ultra Riser option One VGA ports (rear) One serial port (rear) Two USB 3.0 ports (rear)
System Cooling	Four 8-cm heavy duty fans with Optimal Fan Speed Control Air Shroud, CPU heatsinks
Power	Two Redundant Power Supplies, 80Plus Titanium level Default: 1200W Optional: 1600W, 2000W, 1300W DC
Form Factor	2U rackmount; (WxHxD) 17.2 x 3.5 x 29.05 in. (437 x 89 x 737.9 mm)

A link to the Quick Reference Guide can be found on the product page of the Supermicro website.

The following safety models associated with the SYS-620U-TNR have been certified as compliant with UL and CSA: 829U-R12X12, 829U-12

Configuration Options

Ultra Riser Cards

Ultra Riser cards provide network connections and other capabilities. The customer must choose one when purchasing the system.

Ultra Riser Networking Options		
LAN Ports	Part Number	Description
No NIC	AOC-2UR668G4	Two PCIe 4.0 x16 and PCIe 4.0x8 (in x16, internal)
Two 10GBaseT	AOC-2UR68G4-i2XT	Two RJ45, Intel X710-AT2, PCIe 4.0 x8 (in x16, Internal), PCIe 4.0 x8 (in x16), PCIe 4.0 x16
Four 10GBaseT (two SFP+)	AOC-2UR68G4-i4XTS	Two RJ45 and two SFP+, Intel X710-TM4, PCIe 4.0 x8 (in x16, Internal), PCIe4.0 x8 (in x16), PCIe 4.0 x16
Two 25GbE	AOC-2UR68G4-m2TS	Two 25GbE, two SFP28, Mellanox ConnectX-6, PCIe 4.0 x8 (in x16, Internal), PCIe 4.0 x8 (in x16), PCIe 4.0 x16

WIO Riser Cards

Several customer choices are available for other riser cards. See the Expansion Slots and Riser Cards section in this chapter for details.

Storage Protocols

The storage drive bays can support SATA, SAS, and NVMe in any combination. To enable SAS and NVMe, additional hardware is required. Once the supporting hardware is installed for a selection of bays, drives of any storage protocol type can be inserted.

SATA – The default configuration supports up to twelve SATA drives.

SAS – An add-on controller card and cables can support up to twelve SAS drives.

NVMe – The motherboard supports up to ten NVMe drives. A retimer card is required to add support for an additional two NVMe drives. Additional cables are required.

Power Supply Options

Power Supply Module Options		
Watts	Part Number	80Plus Level
1200	PWS-1K22A-1R (default)	Titanium
1600	PWS-1K62A-1R	Titanium
2000	PWS-2K08A-1R	Titanium
1300 DC	PWS-1K30D-1R	Not applicable

1.2 System Features

The following views of the system display the main features. Refer to Appendix B for additional specifications.

Front View

Service/Asset Tag with BMC Password

Control Panel

Figure 1-1. Front View

Logical Storage Drive Numbers	
Item	**Description**
0-5	3.5" hot-swap SAS3*/SATA/NVMe* drive bays (NVMe from CPU1)
6-11	3.5" hot-swap SAS3*/SATA/NVMe* drive bays (NVMe from CPU2)

* SAS3 and NVMe support requires with additional parts

Drive Carrier Indicators

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

Drive Carrier LED Indicators			
	Color	**Blinking Pattern**	**Behavior for Device**
Activity LED	Blue	Solid On	Idle SAS or NVMe drive installed
	Blue	Blinking	I/O activity
	Off		Idle SATA or no drive

Drive Carrier LED Indicators			
	Color	**Blinking Pattern**	**Behavior for Device**
Status LED	Red	Solid On	Failure of drive with RSTe support
	Red	Blinking at 1 Hz	Rebuild drive with RSTe support
	Red	Blinking at 4 Hz	Identify drive with RSTe support
	Red	Blinking with two blinks and one stop at 1 Hz	Hot spare for drive with RSTe support
	Red	On for five seconds, then off	Power on for drive with RSTe support
	Amber	Blinking	Safe to remove NVMe drive
	Green	Solid on	Ejecting an NVMe drive

Control Panel
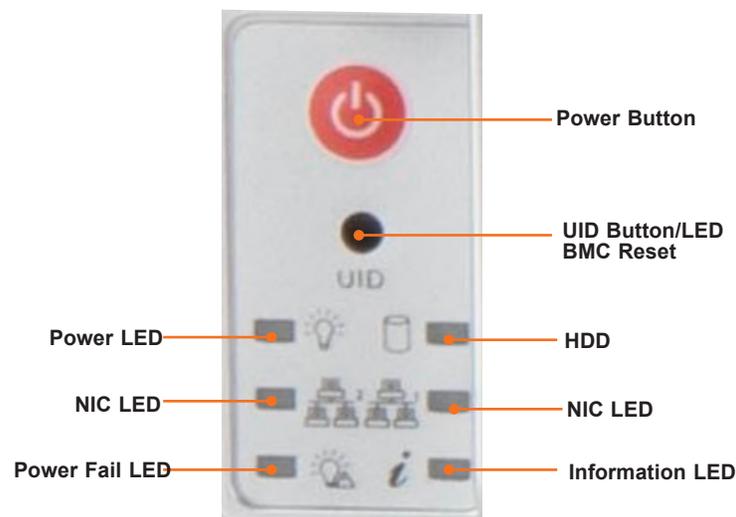
Figure 1-2. Control Panel

Control Panel Features	
Feature	**Description**
Power button	The main power switch applies or removes primary power from the power supply to the server but maintains standby power. Hold for four seconds to force a shut-down.
UID button/LED BMC reset	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. This button can also be used to reset the BMC.
Power LED	Steady on – Power on Blinking at 4Hz – Checking BIOS/BMC integrity Blinking at 4Hz and "i" LED is blue – BIOS firmware updating Two blinks at 4Hz, one pause 2hz and "i" LED blue – BMC firmware updating Blinking at 1Hz and "i" LED red – Fault detected
HDD LED	Indicates activity on the storage drives when flashing.
NIC LED	Indicates network activity on LANs when flashing.
Power Fail LED	Indicates a power supply module has failed.
Information LED	Alerts operator to several states, as noted in the table below

Information LED	
Color, Status	**Description**
Red, solid	An overheat condition has occurred.
Red, blinking at 1Hz	Fan failure, check for an inoperative fan.
Red, blinking at 0.25Hz	Power failure, check for a non-operational power supply.
Red, solid, with Power LED blinking green	Fault detected
Blue and red, blinking at 10 Hz	Recovery mode
Blue, solid	UID has been activated locally to locate the server in a rack environment.
Blue, blinking at 1Hz	UID has been activated using the BMC to locate the server in a rack environment.
Blue, blinking at 2Hz	BMC is resetting
Blue, blinking at 4Hz	BMC is setting factory defaults
Blue, blinking at 10Hz with Power LED blinking green	BMC/BIOS firmware is updating

Rear View
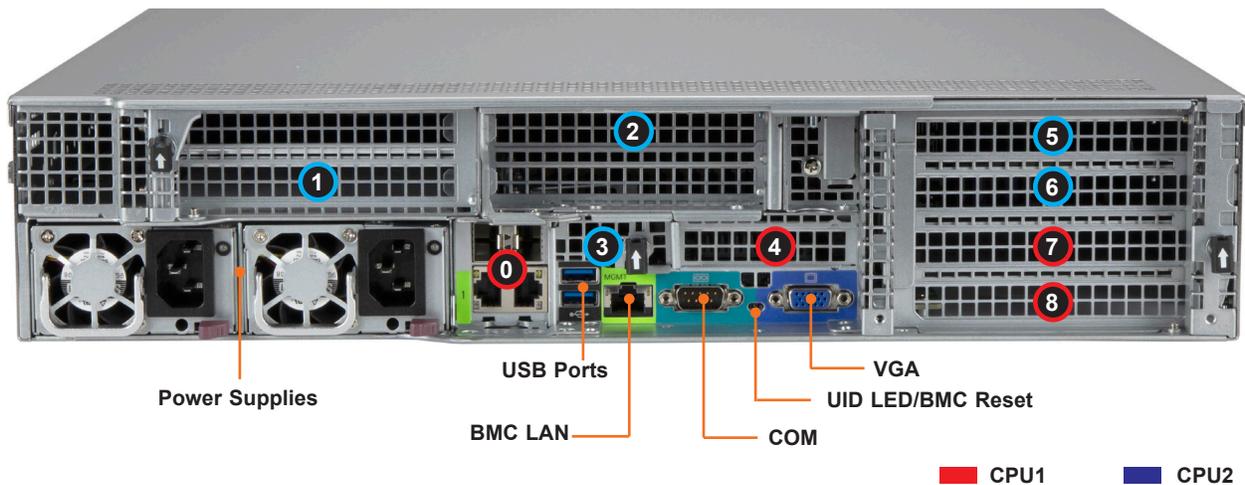
Figure 1-3. System: Rear View

System Features: Rear	
Feature	**Description**
Power Supplies	Two redundant power supply modules, PWS1 on the left, PWS2 on the right
0	LAN ports; specifications depend on your Ultra riser card option
1 to **8**	Expansion card slots; see the next page for details
USB	Two USB 3.0 ports
BMC LAN	BMC LAN port; for indicator details, see BMC LAN LEDs
UID LED/ BMC Reset	UID button and BMC reset button (see Control panel description)
COM	Serial port
VGA	Video port

Power Supply Indicator

LEDs on the power supplies indicate the status of the module.

Power Supply Indicator	
LED Color and State	**Power Supply Condition**
Solid Green	Indicates that the power supply is on
Blinking Green	Indicates that the power supply is plugged in and turned off by the system.
Blinking Amber	Indicates that the power supply has a warning condition and continues to operate.
Solid Amber	Indicates that the power supply is plugged in, and is in an abnormal state. The system might need service. Please contact Supermicro technical support.
Off	No AC power to modules

Expansion Slots and Riser Cards

This system offers options for riser cards that provide custom PCIe capabilities—one Ultra Riser card, one right-facing WIO riser card, and one left-facing WIO card.

PCIe Slots per Riser Card			
Riser Card	**Part Number**	**Slot**	**Description (all PCIe 4.0)**
Ultra Riser card	AOC-2UR668G4	1 2 3	x16 FH, 10.5"L, 75W (CPU2) x16 FH, 10.5"L, 75W (CPU2) x8 (in x16), Internal LP, 75W (CPU1)
	AOC-2UR68G4-i2XT AOC-2UR68G4-i4XTS AOC-2UR68G4-m2TS	1 2 3	x16 FH, 10.5"L, 75W (CPU2) x8 (in x16) FH, 10.5"L, 75W (CPU2) x8 (in x16) Internal LP, 75W (CPU2)
Right-facing	RSC-WR-6	4	x16 low profile, 75W (CPU1)
Left-facing	RSC-W2-8888G4	5 6 7 8	x8 FH, 10.5"L, 25W (CPU2) x8 FH, 10.5"L, 25W (CPU2) x8 FH, 10.5"L, 25W (CPU1) x8 FH, 10.5"L, 25W (CPU1)
	RSC-W2-688G4	5 7 8	x16 FH, 10.5"L, 75W (CPU2) x8 (in x16) FH, 10.5"L, 75W (CPU1) x8 (in x16) FH, 10.5"L, 75W (CPU1)
	RSC-W2-66G4	5 7	x16 FH, 10.5", 75W (CPU2) x16 FH, 10.5", 75W (CPU1)

One riser card slot may be used for a controller card that supports SAS. Up to three slots may be used for retimer cards to support NMVe drive bays.

LAN Speed Indicator

LAN ports are provided by the Ultra Riser cards. One LED indicates the network speed.

LAN LED (Speed Indicator)		
Color	**10GbE**	**25GbE**
Green	10 Gb/s	25 Gb/s
Amber	1 Gb/s	10 Gb/s

Top View
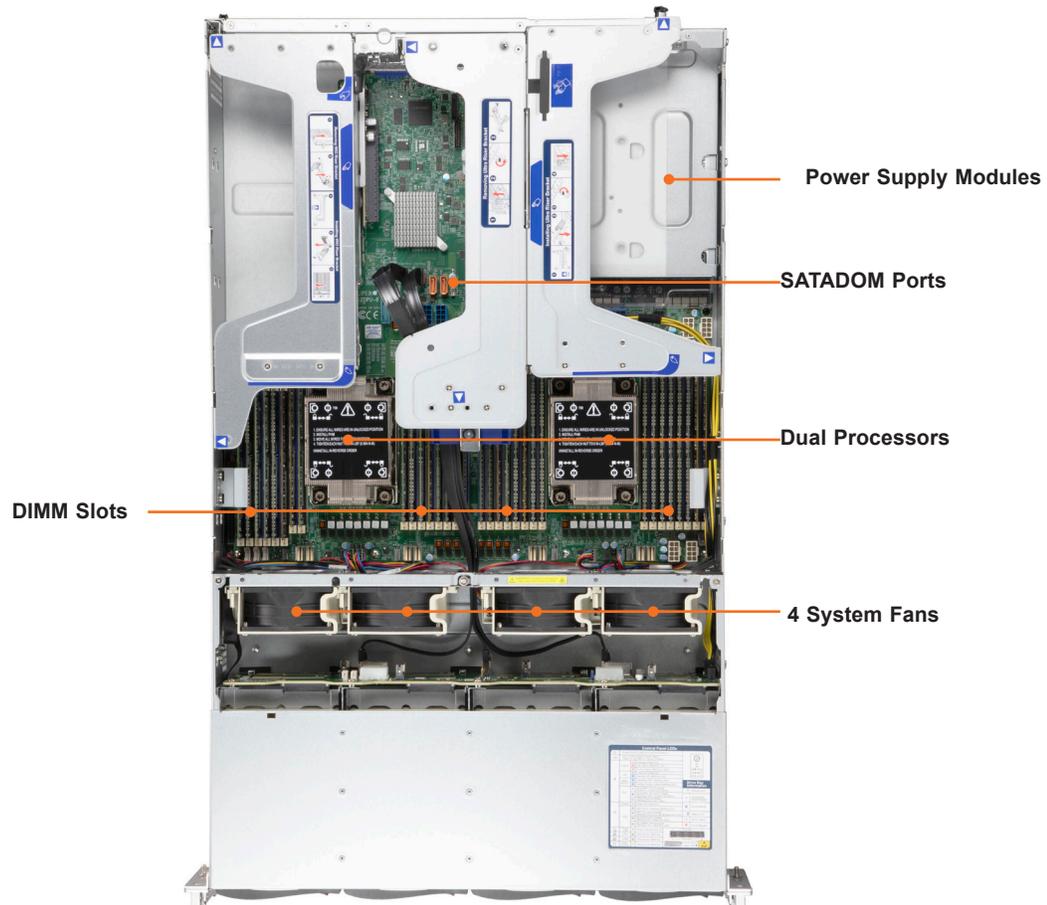
Figure 1-4. System: Top View

System Features: Top	
Feature	**Description**
Power Supply	Dual redundant modules; see options on previous page
SuperDOM ports	Disk-on-Module port allows for flash cards to be mounted directly on the motherboard
DIMM slots	Dual in-line memory module (DIMMs) slots
Processors	Dual Intel Xeon Scalable Processors with heatsinks, SNK-P0078P
System fans	Four 8-cm heavy duty PWM fans, FAN-0209L4

1.3 System Architecture

This section shows the locations of the system electrical components, and a block diagram of the overall system.

Main Components

Riser Card, Left-facing

Ultra Riser Card; ([options](#))

Riser Card, Right-facing

Motherboard X12DPU-6

Storage Backplane BPN-NVME4-216N-S24
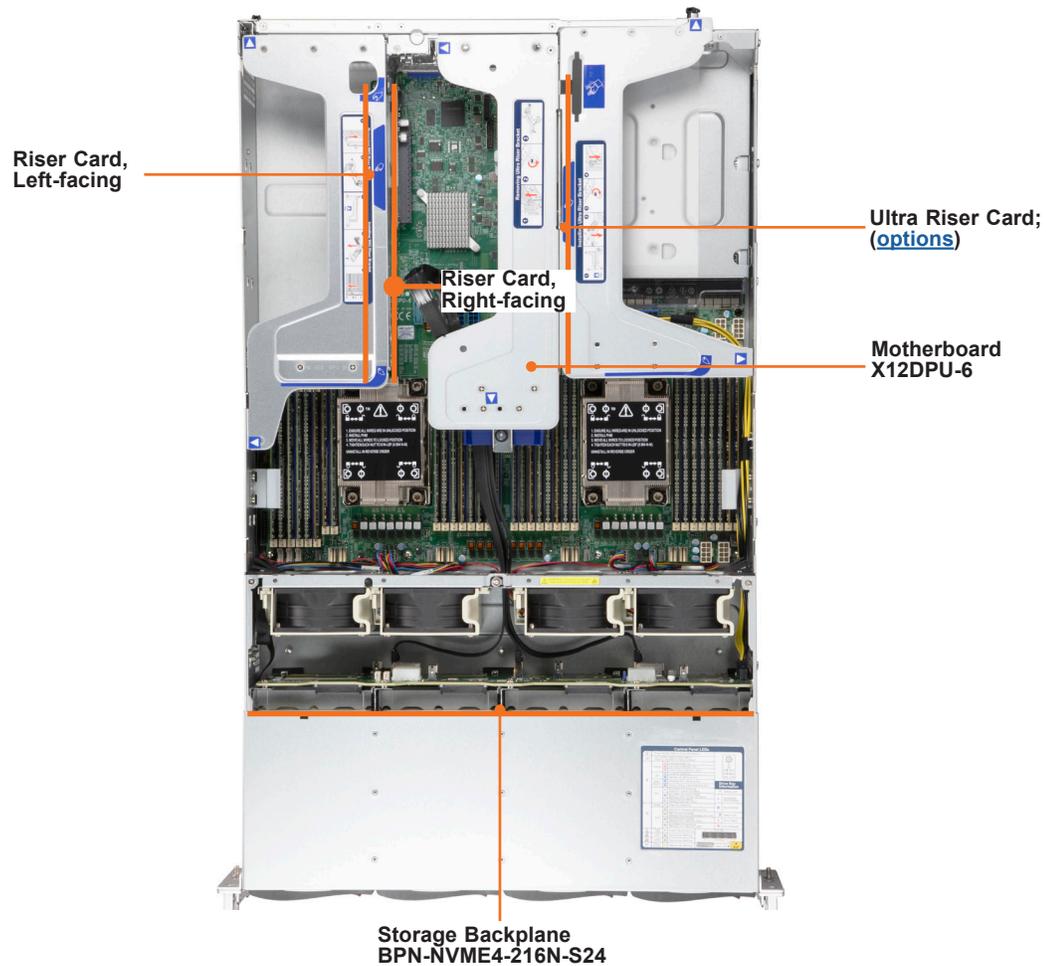
Figure 1-5. Main Component Locations

System Block Diagram

The block diagram below shows the connections and relationships between the subsystems and major components of the overall system.
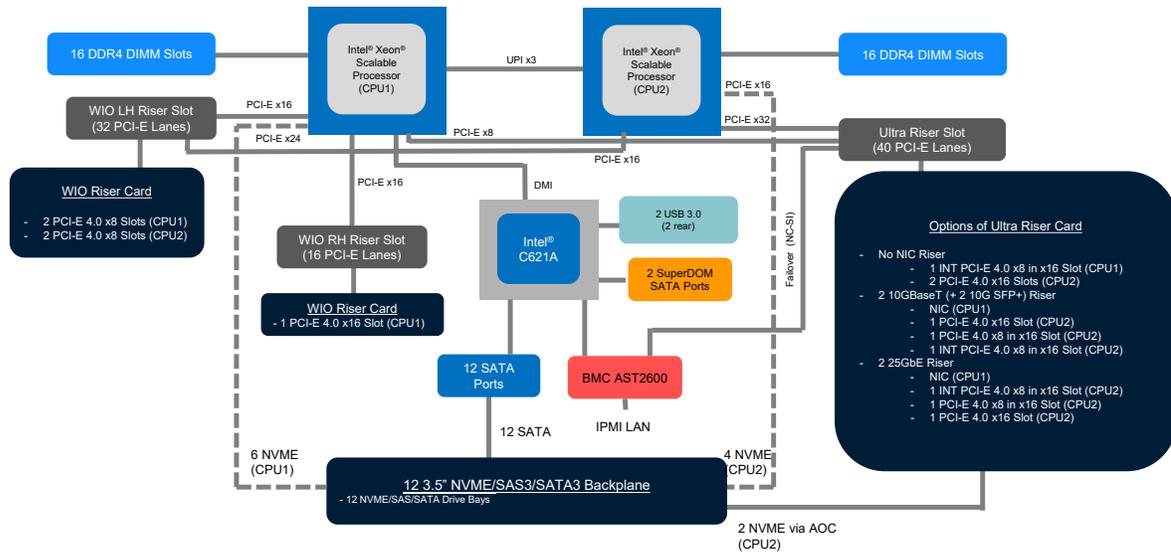
Figure 1-6. System Block Diagram

1.4 Motherboard Layout

Below is a layout of the X12DPU-6 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 1-7. Motherboard Layout

Quick Reference

Jumper	Description	Default Setting
JBT1	Clear CMOS	Open (Normal)
JUID	UID Enable/System Reset Jumper	Pins 1-2 (UID Enabled)

Connector	Description
BT1	Onboard CMOS battery
COM1	Backplane COM port
FAN1 ~ FAN8	CPU/System fan headers
FP1	FFC (Flat Flexible Cable) connector
BMC_LAN	Dedicated BMC LAN port (JLAN1)
I-SATA 0~3, I-SATA 4~7	Intel PCH SATA 3.0 ports
S-SATA 0~3, S-SATA 4/S-SATA 5	S-SATA 0~3, S-SATA 4/S-SATA 5 supported by Intel PCH (S-SATA 4/5: Powered SATA connectors (with power pins built-in to be used of SuperDOM devices)
JF1	Front Control Panel header
JF3	Front Panel sensor
JF4	BMC I²C Signal for 24 NVMe BPN (Backplane)
JIPMB1	4-pin BMC external I²C header (for a BMC card)
JL1	Chassis intrusion header
JNCSI	NC-SI (Network Controller Sideband Interface) connector
JNVI²C3/JNVI²C4	NVMe I²C headers (JNVI²C3: for VPP#1/JNVI²C4: for VPP#2)
JGPW1/JGPW2/JGPW3/JGPW4	GPU 8-pin power connectors (power connectors for GPU use)
JPW1/JPW2/JPW3/JPW4	Backplane 8-pin power connectors (for backplane devices)
JUIDB	UID LED/BMC Reset switch
JVGA2	Front accessible VGA connection header (optional)
PSU1/PSU2	Power Supply Unit #1/Power Supply Unit #2 for system use
JSD1/JSD2	SATA DOM (Disk_On_Module) power connectors
JTPM1	Trusted Platform Module connector
P1-NVMe1/3/4/5/6	PCIe 4.0 x8 NVME ports
P2-NVMe7/8/9/10	PCIe 4.0 x8 NVME ports
SXB1A/SXB1B/SXB1C	PCIe 4.0 (x16 + x16) Left riser card slot supported by CPU1/CPU2
SXB2	PCIe 4.0 x16 slot supported by CPU1
SXB3A/SXB3B/SXB3C	PCIe 4.0 (x16 + x16 + x8) Ultra riser slot supported by CPU2
T-SGPIO3	Serial_Link General-Purpose I/O connection header (for S-SATA 4/5 SuperDOM support)
USB0/1 (3.0)	Rear I/O USB 3.0 ports
USB3/4 (3.0)	Front accessible USB header with two USB 3.0 connections
VGA	Backplane VGA port
VROC (JRK1)	Intel VROC Key Header for NVMe RAID

LED	Description	State: Status
JF2	LAN LED	Ethernet LAN LED Indicators (Blink: Active)
LE2	Power_on LED	System Power LED: (On: System Power on)

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LED	Description	State: Status
LEDM1	BMC Heartbeat LED	Blinking Green: BMC Normal
LED1	Rear UID (Unit Identifier) LED	Solid Blue: Unit Identified

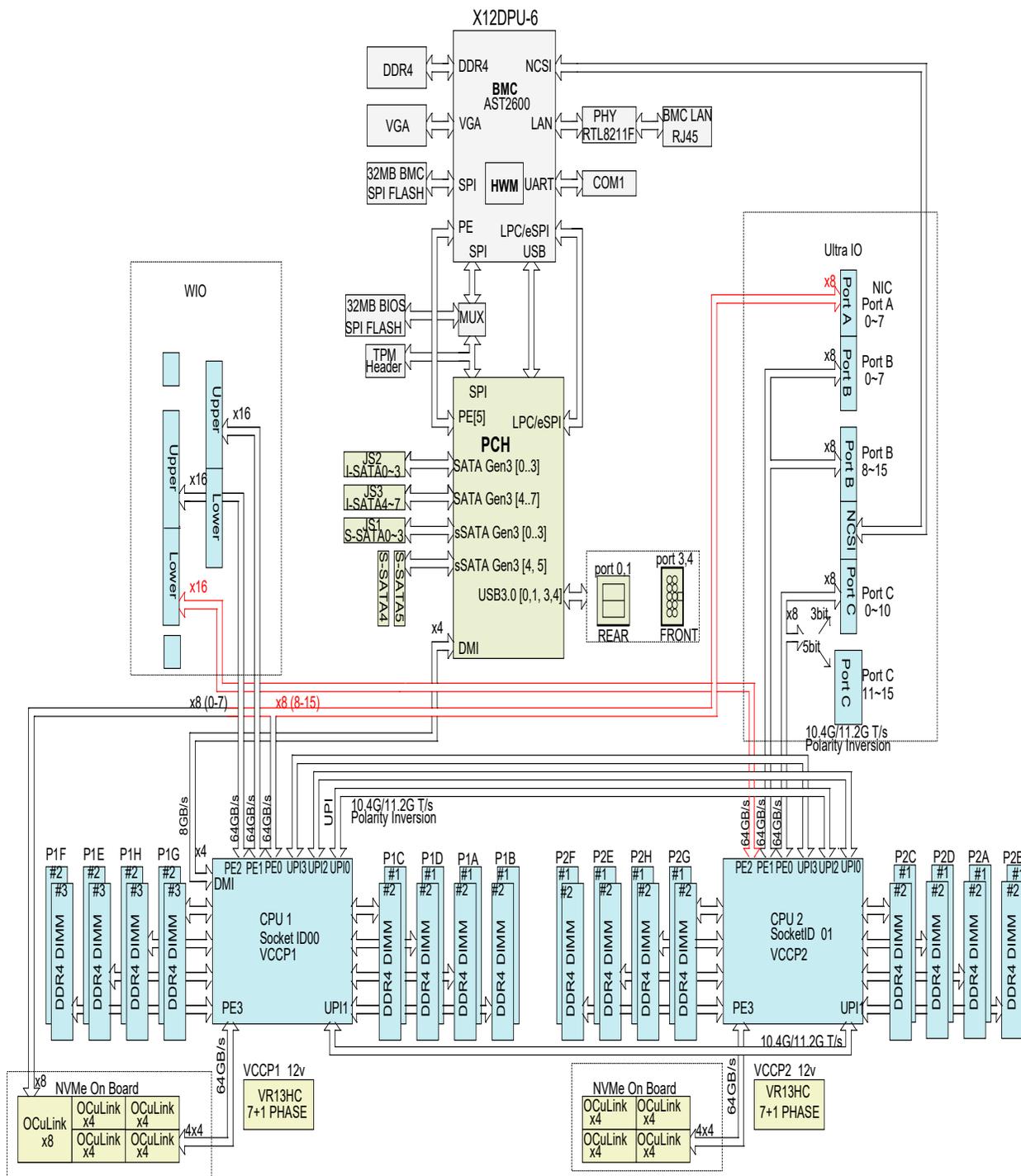## Motherboard Block Diagram

Figure 1-8. 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 system was shipped, and note if it was damaged. If any equipment appears damaged, file a claim with the carrier.

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.

- Do not use a two-post "telco" type rack for 2U or larger servers.

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.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the room's ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (TMRA).

Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

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

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.

- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.

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

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

2.4 Installing the Rails

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

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

Identifying the Rails

The chassis package includes two rail assemblies. Each assembly consists of three sections: An inner rail that secures directly to the chassis, an outer rail that secures to the rack, and a middle rail which extends from the outer rail. These assemblies are specifically designed for the left and right side of the chassis and labeled.
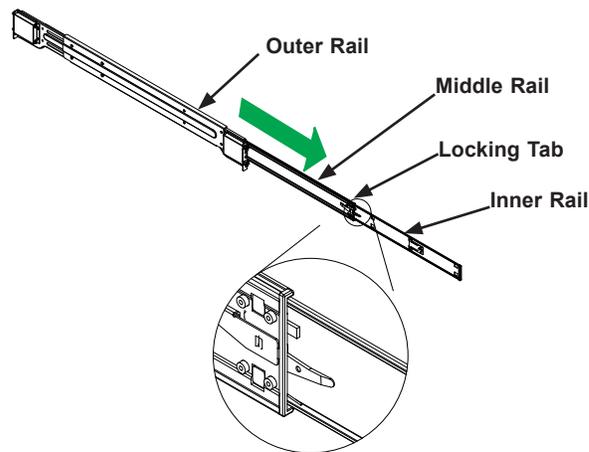
Figure 2-1. Identifying the Outer Rail, Middle Rail and Inner Rail
(Left Rail Assembly Shown)

Releasing the Inner Rail

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

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

1. Pull the inner rail out of the outer rail until it is fully extended as illustrated below.

2. Press the locking tab down to release the inner rail.

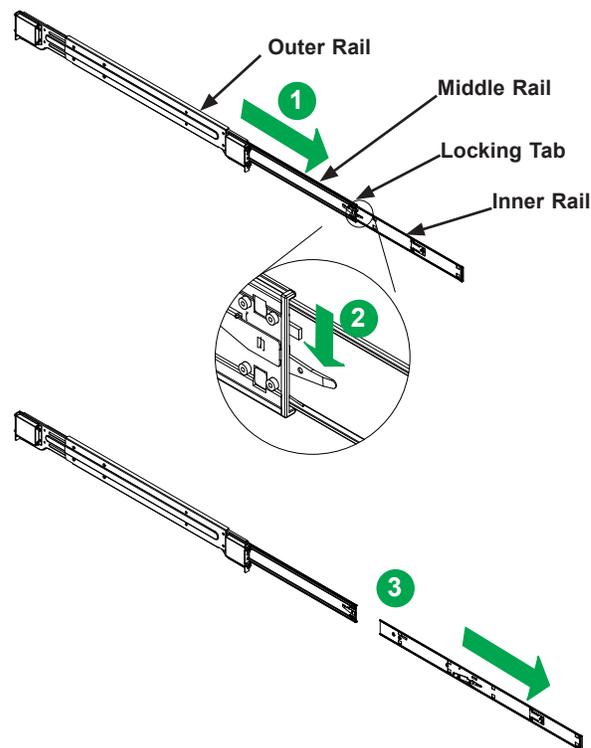3. Pull the inner rail all the way out.

Figure 2-2. Extending and Releasing the Inner Rail

Installing the Inner Rails on the Chassis

Installing the Inner Rails

1. Identify the left and right inner rails. They are labeled.

2. Place the inner rail firmly against the side of the chassis, aligning the hooks on the side of the chassis with the holes in the inner rail.

3. Slide the inner rail forward toward the front of the chassis until the quick release bracket snaps into place, securing the rail to the chassis.

4. Optionally, you can further secure the inner rail to the chassis with screws.
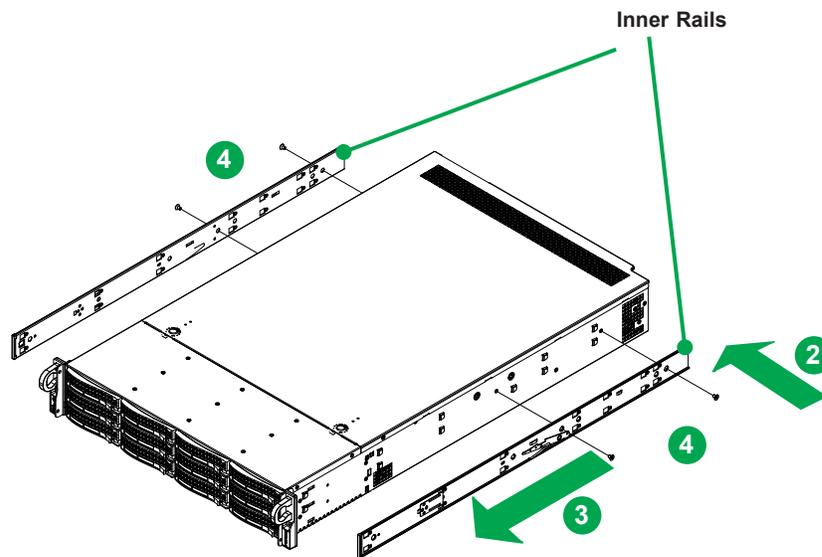
Figure 2-2. Installing the Inner Rails
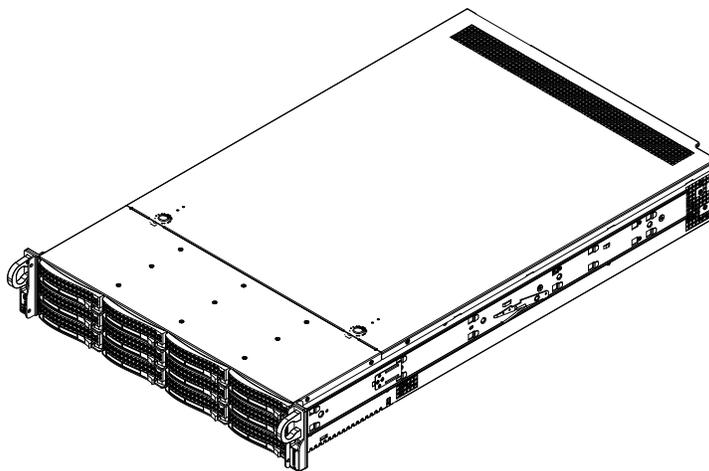
Figure 2-3. Inner Rails Installed on the Chassis

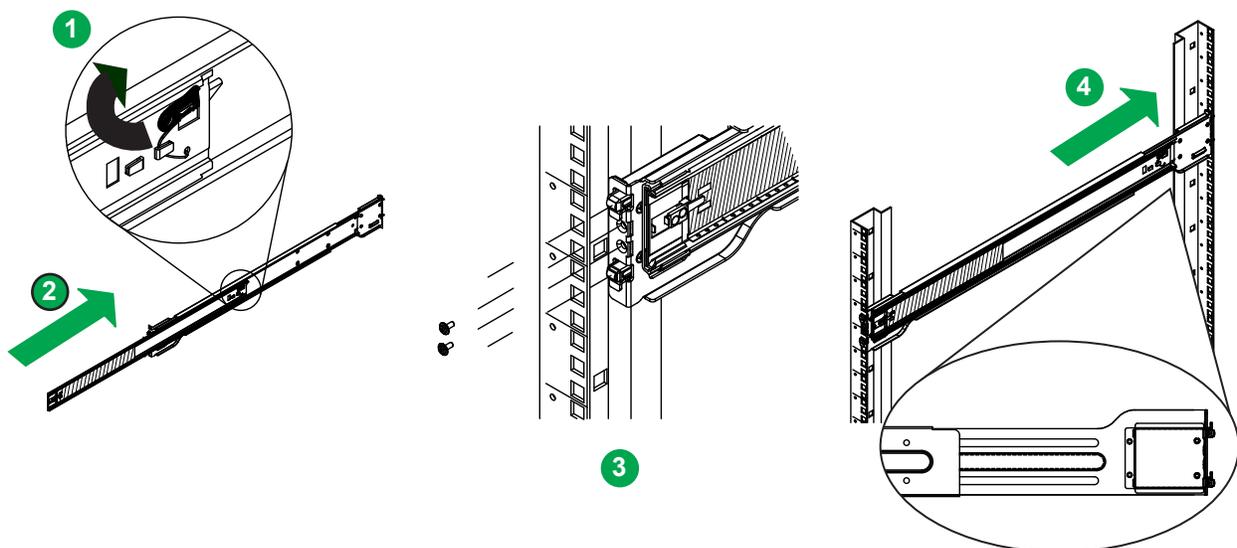## Installing the Outer Rails onto the Rack

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

Installing the Outer Rail

1. Press upward on the locking tab at the rear end of the middle rail.

2. Push the middle rail back into the outer rail.

3. Hang the hooks on the front of the outer rail onto the square holes on the front of the rack. If desired, use screws to secure the outer rails to the rack.

4. Pull out the rear of the outer rail, adjusting the length until it just fits within the posts of the rack.

5. Hang the hooks of the rear section of the outer rail onto the square holes on the rear of the rack. Take care that the proper holes are used so the rails are level. If desired, use screws to secure the rear of the outer rail to the rear of the rack.

Figure 2-4. Extending and Mounting the Outer Rails

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

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

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

2.5 Installing the Chassis into a Rack

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

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

Installing the Chassis into a Rack

1. Extend the outer rails as illustrated.

2. Align the inner rails of the chassis with the outer rails on the rack.

3. Slide the inner rails into the outer rails, keeping the pressure even on both sides. When the chassis has been pushed completely into the rack, it should click into the locked position.

4. Optional screws may be used to hold the front of the chassis to the rack.
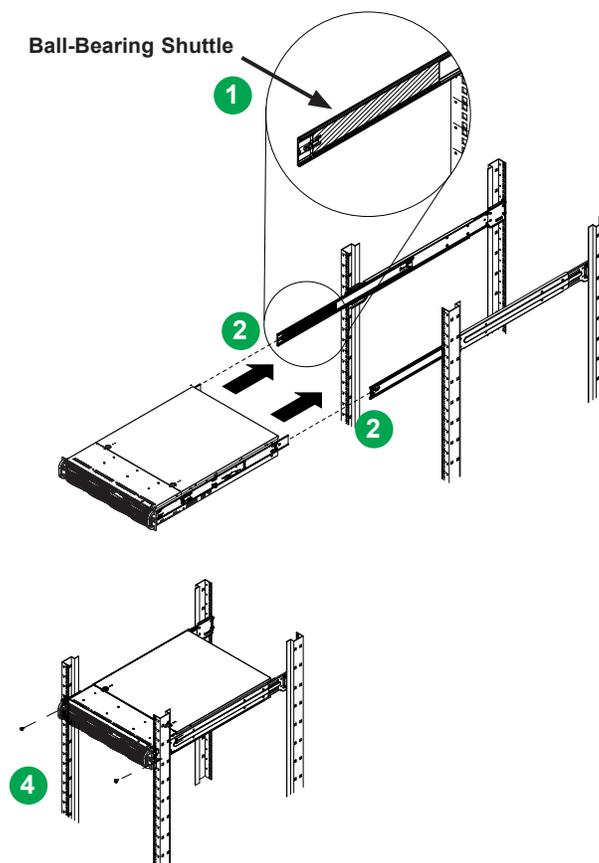
Figure 2-5. Installing the Server into the Rack

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

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

Removing the Chassis from the Rack

Caution! It is dangerous for a single person to off-load the heavy chassis from the rack without assistance. Be sure to have sufficient assistance supporting the chassis when removing it from the rack. Use a lift.

1. If necessary, loosen the thumb screws on the front of the chassis that hold it in the rack.

2. Pull the chassis forward out the front of the rack until it stops.

3. Press the release latches on each of the inner rails downward simultaneously and continue to pull the chassis forward and out of the rack.
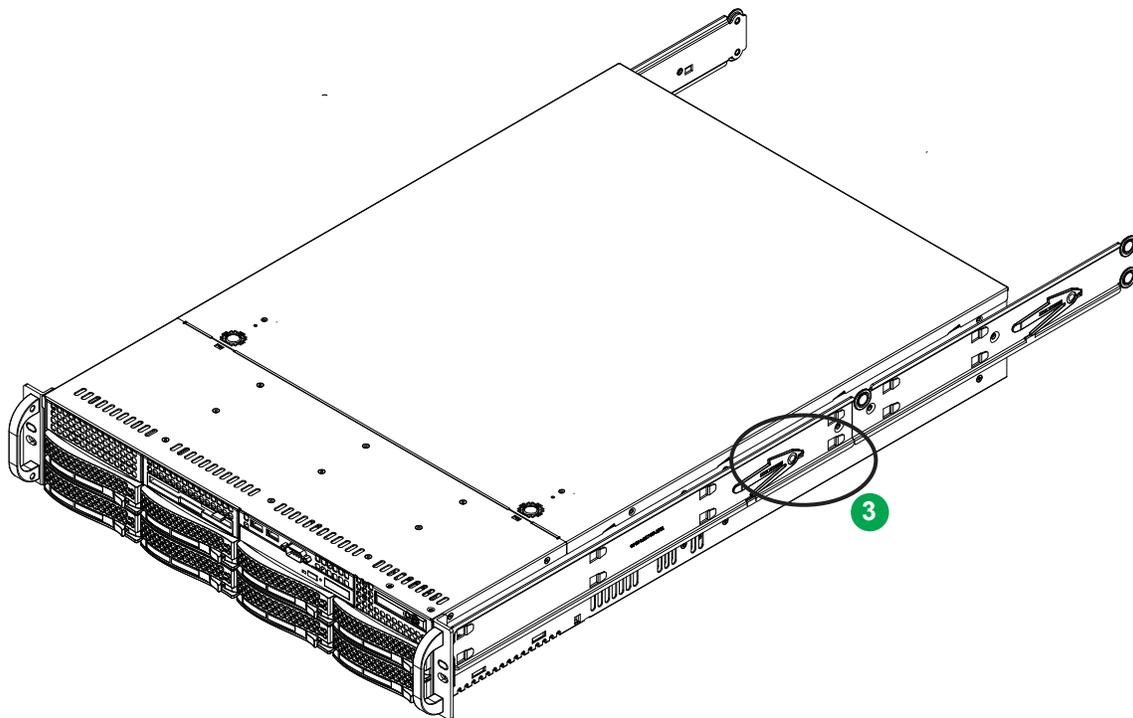
Figure 2-6. Removing the Chassis From the Rack

Chapter 3

Maintenance and Component Installation

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

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

3.1 Removing Power

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

1. Use the operating system to power down the system.

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

3. Disconnect the power cord(s) from the power supply module(s).

3.2 Accessing the System

A removable top cover allows access to the inside of the chassis.

Removing the Top Cover

1. Remove the two screws on each side of the cover, which secure the cover to the chassis. These two screws are optional and will not impact functionality if they are not installed.

2. Press the two release buttons and slide the cover toward the rear.

3. Lift the top cover up.

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

Caution: Except for short periods of time, do not operate the server without the cover in place. The chassis cover must be in place to allow for proper airflow and to prevent overheating.
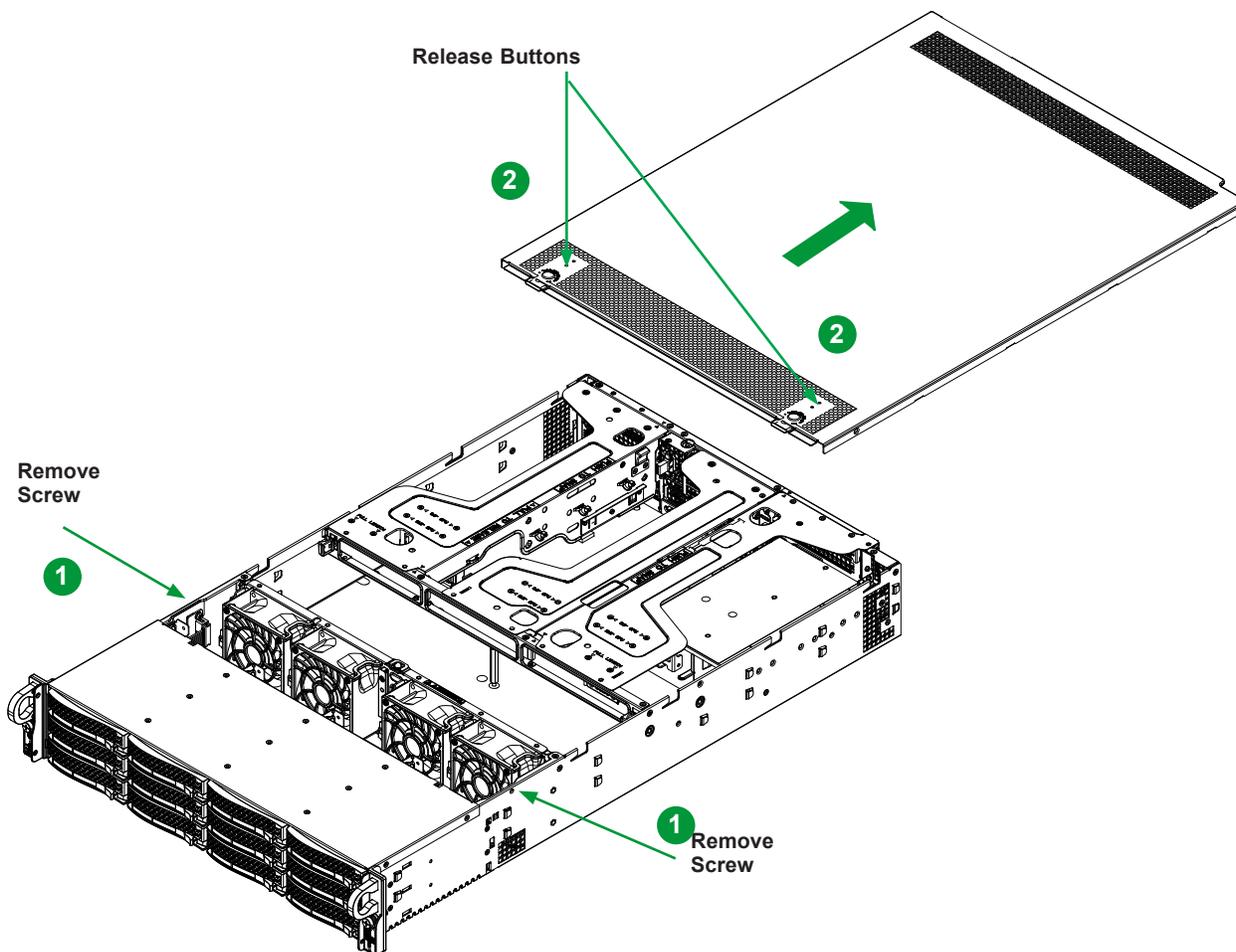
Figure 3-1. Removing the Chassis Cover

3.3 Processor and Heatsink Installation

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

Notes:

- Use ESD protection.

- Unplug the AC power cord from all power supplies.

- 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.

- When handling the processor, avoid touching or placing direct pressure on the land grid array (gold contacts).

- Improper installation or socket misalignment can cause serious damage to the processor or the socket and may require manufacturer repairs.

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

- Refer to the Supermicro website for updates on processor support.

- Graphics in this manual are for illustration only. Your components may look different.

The Processor Carrier Assembly

The processor carrier assembly is comprised of the processor and the processor carrier.

1. Hold the processor with the land grid array (LGA, gold contacts) 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.

Pin 1

Processor

Pin 1
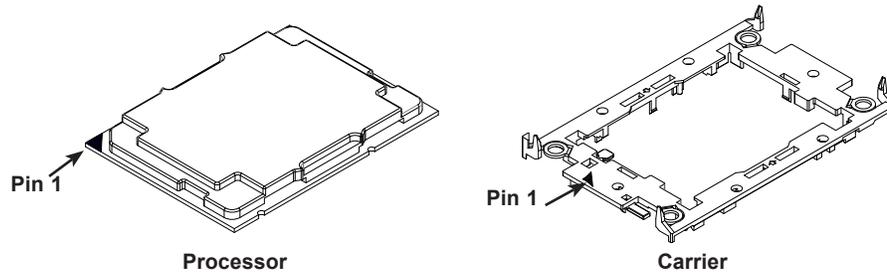
Carrier

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

Processor (Reverse Side Up)

Latch

Latch

Latch

Carrier (Top Side Up)

CPU Key
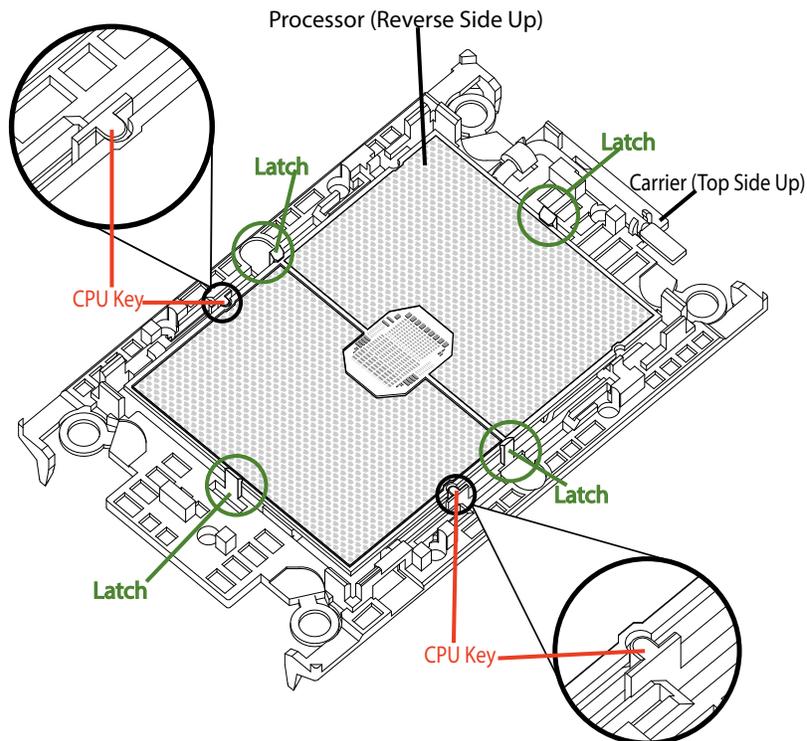
Latch

Latch

CPU Key

3. Locate the lever on the carrier and, if necessary, press it down as shown below.

Lever
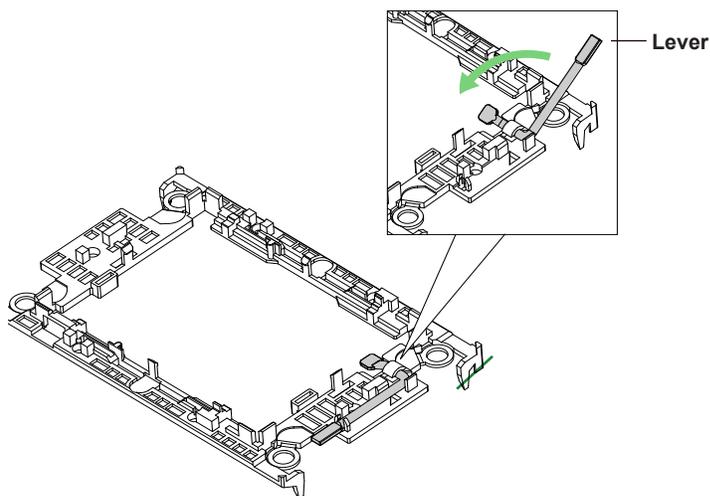
4. Align the CPU keys on the processor (A & B) with those on the carrier (a & b) as shown below.

Latch

CPU Key (on the processor)
CPU Key (on the carrier)
B
b
1
2
A
a
Latch
CPU Key (on the processor)
CPU Key (on the carrier)
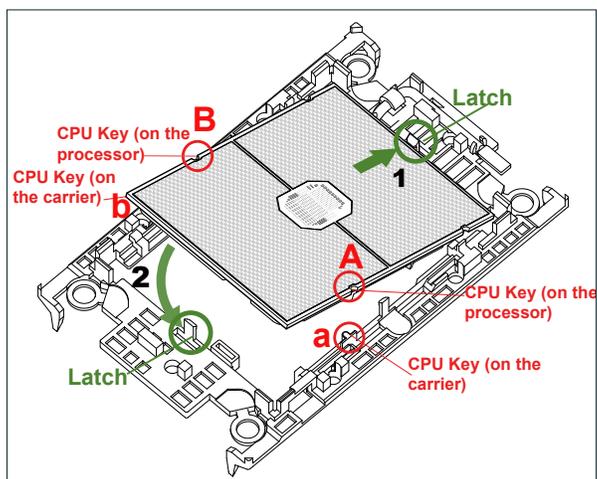
5. Carefully place one end of the processor under latch 1 on the carrier, and then press the other end down until it snaps into latch 2 and is properly seated on the carrier.

**Processor Carrier Assembly
(Top View)**

**Processor Carrier Assembly
(Underside view)**
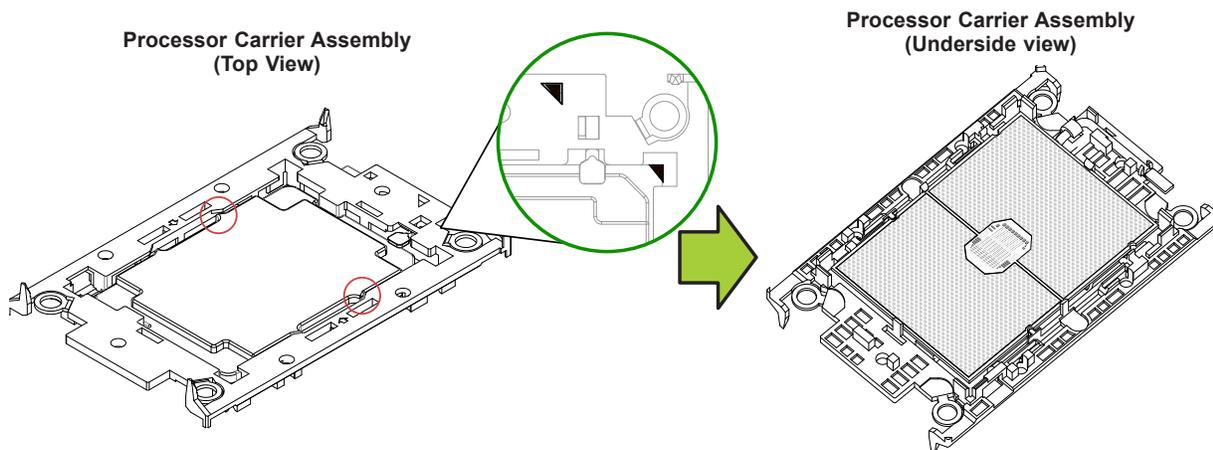
The Processor Heatsink Module (PHM)

After creating the processor carrier assembly, mount the heatsink onto the carrier assembly to form the processor heatsink module (PHM).

Note: If this is a new heatsink, the thermal grease has been pre-applied. Otherwise, apply the proper amount of thermal grease to the underside of the heatsink.

1. Turn the heatsink over with the thermal grease facing up. Note the two triangle cutouts (A, B) located at the diagonal corners of the heatsink as shown in the drawing below.

2. On the processor carrier assembly, find pin 1, as noted by the triangles. Hold the processor carrier assembly over so that the gold LGA is facing up.

3. Align clip "a" (pin 1) on the carrier assembly with the triangular cutout A on the heatsink and b, c, d on the carrier assembly with B, C, D on the heatsink.

4. Push the carrier assembly onto the heatsink, making sure that all four clips on each corner are properly secured.

Processor Carrier Assembly

Heatsink
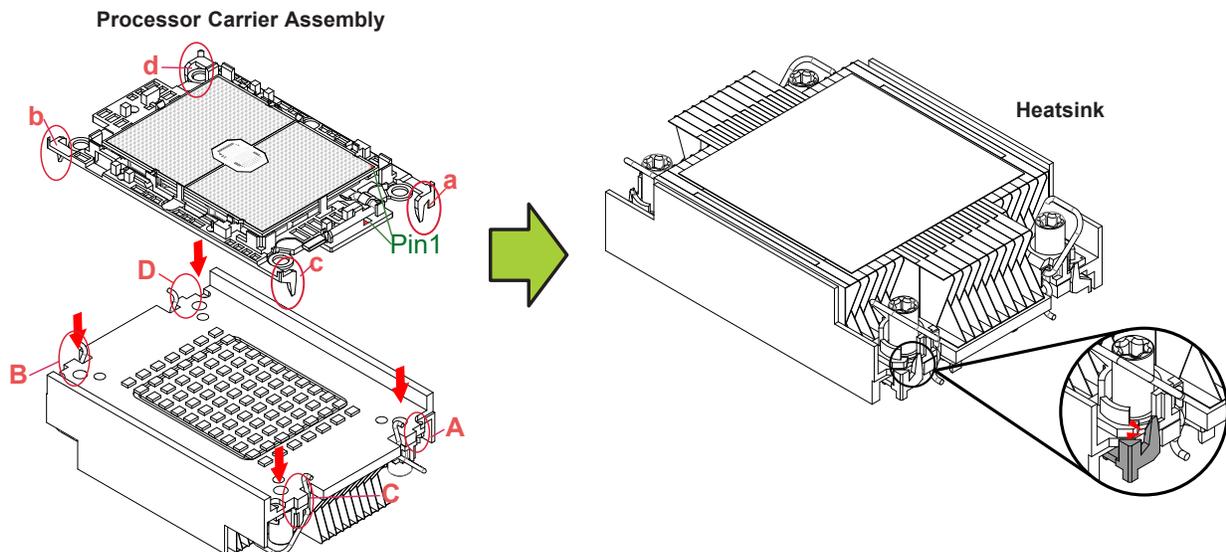
Installing the PHM into the CPU Socket

1. Remove the plastic protective cover from the CPU socket. Gently squeeze the grip tabs then pull the cover off.

CPU Socket with Plastic Protective Cover

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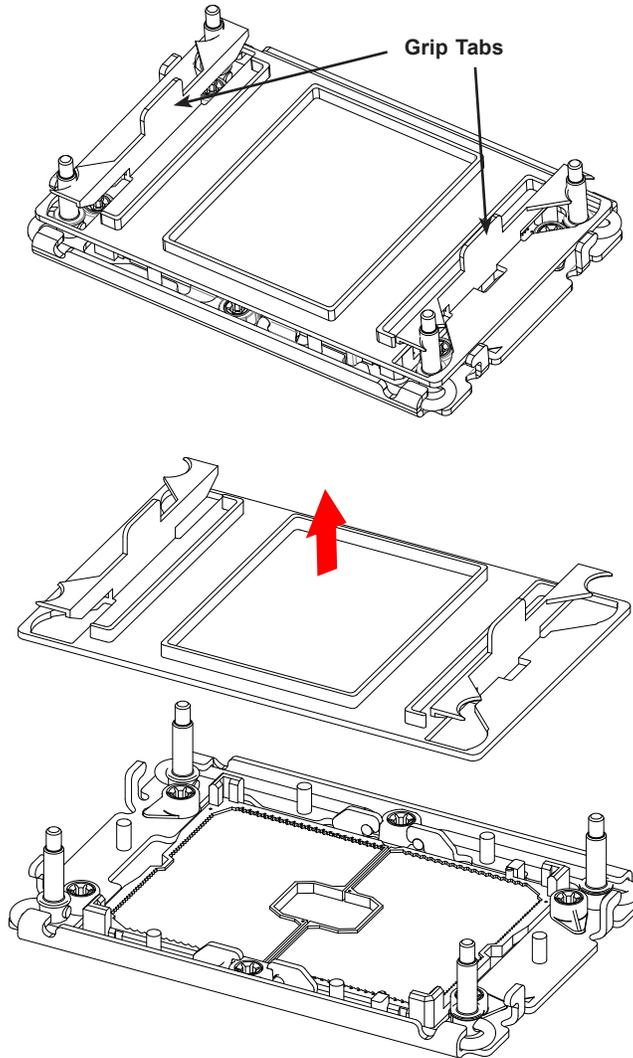
2. Locate four threaded fasteners (a, b, c, d) on the CPU socket.

b   **CPU Socket**   **Threaded Fastener**

d

c

a

(a, b, c, d: Threaded Fasteners)   CPU Socket Pin1
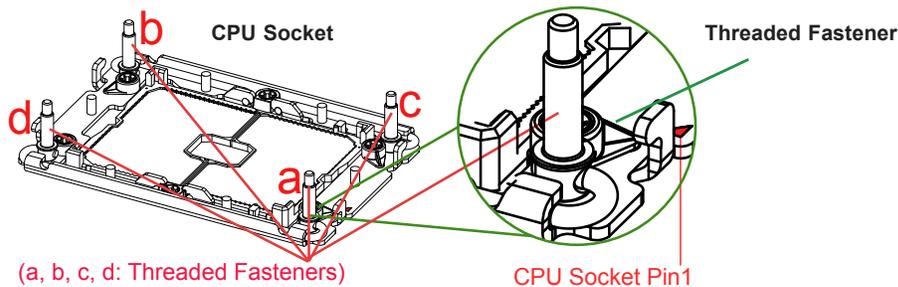
3. Locate four PEEK nuts (A, B, C, D) and four rotating wires (1, 2, 3, 4) on the heatsink as shown below.

A, B, C, D: Peek Nut
1, 2, 3, 4: Rotating Wire
a, b, c, d: Threaded Fastener

Heatsink

Rotating Wire **2**   **B**

Rotating Wire **4**   **D**

Rotating Wire **3**

Rotating Wire

Peek Nut

(Unlatched)   (latched)

C

Rotating Wire **1**

Peek Nut

A
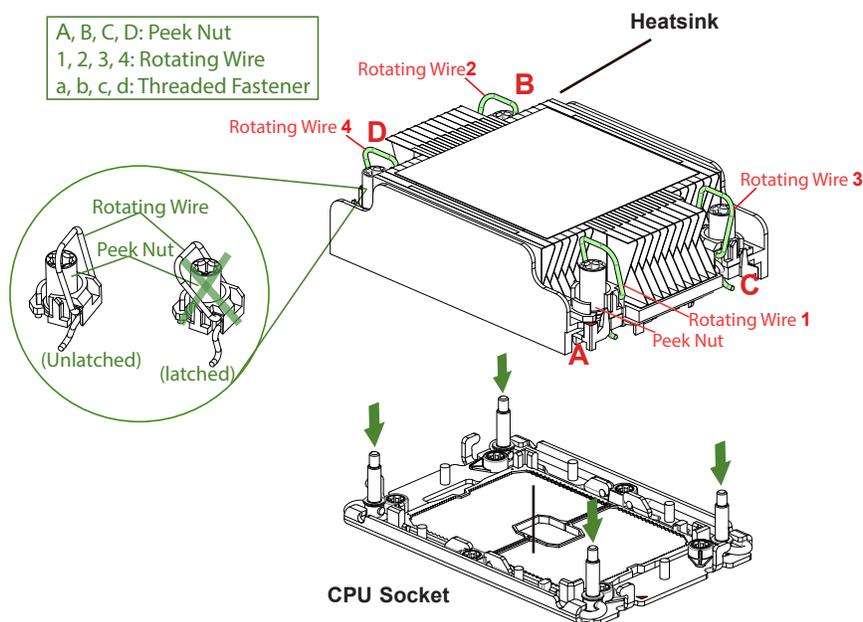
CPU Socket

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

Unlatched State

Top View

Rotating Wire   Side View

Peek Nut
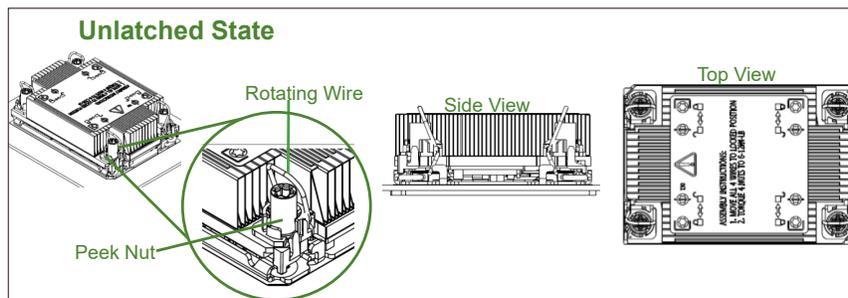
5. Align nut A (next to the triangles and pin 1) on the heatsink with threaded fastener "a" on the CPU socket. Also align nuts B, C, D on the heatsink with threaded fasteners b, c, d on the CPU socket.

6. Gently place the heatsink on the CPU socket, making sure that each nut is properly aligned with its corresponding threaded fastener.

A, B, C, D: Peek Nut on the Heatsink

a, b, c, d:
Threaded Fastener on the CPU socket
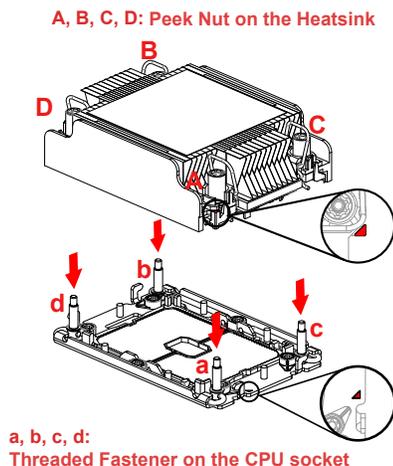
7. Press all four rotating wires outward to latch the PHM onto the CPU socket.
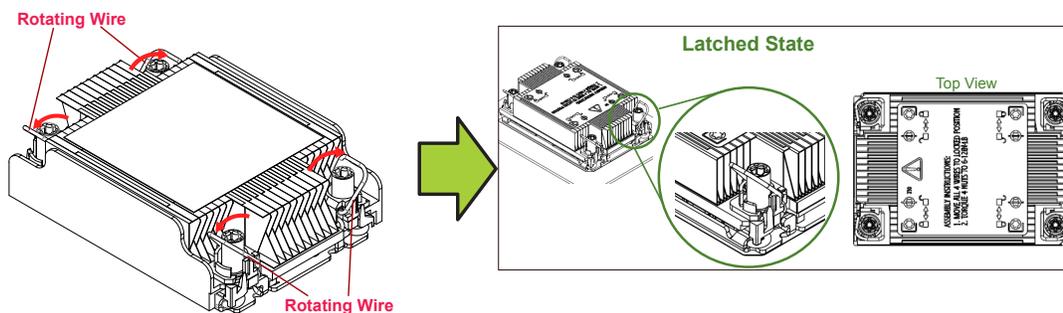
8. With a t30-bit screwdriver, tighten all PEEK nuts in the sequence of A, B, C, and D with even pressure not greater than 12 lbf-in.
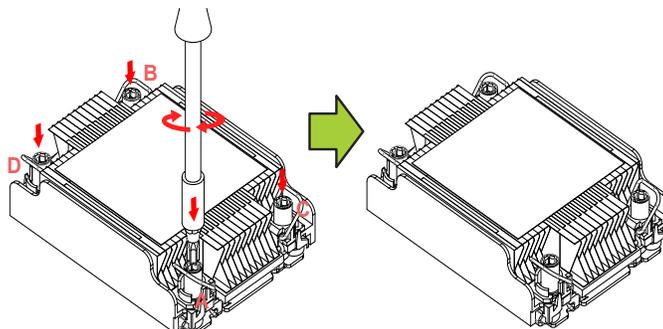
Removing the PHM from the CPU Socket

Be sure the system is shut down and all AC power cords are unplugged.

1. Use a t30-bit screwdriver to loosen the four PEEK nuts on the heatsink in the sequence of A, B, C, and D.
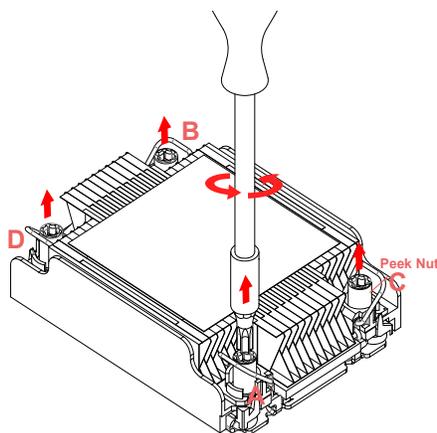
2. Press the four rotating wires inward to unlatch the PHM as shown below.
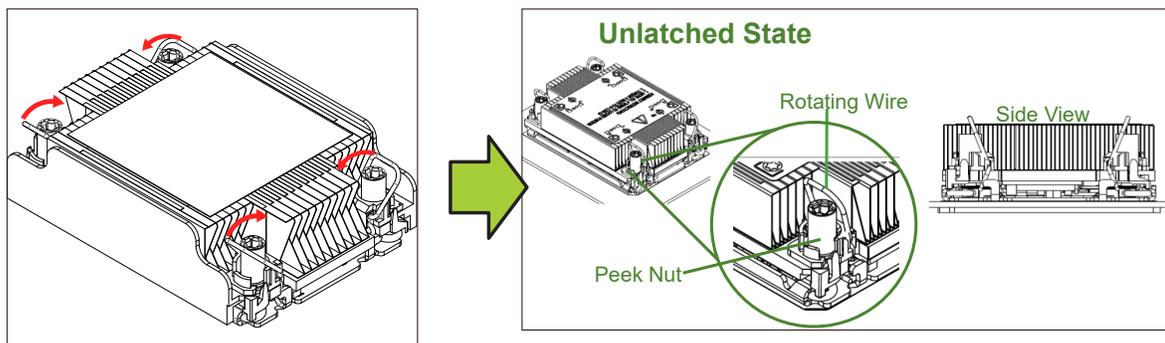
3. Gently lift the PHM upward to remove it from the CPU socket.
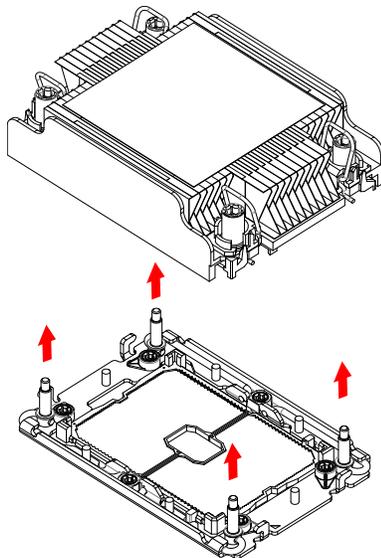
Removing the Processor Carrier Assembly from the PHM

Detach the four plastic clips (a, b, c, d) on the processor carrier assembly from the four corners of the heatsink (A, B, C, D) as shown below, and lift off the processor carrier assembly.
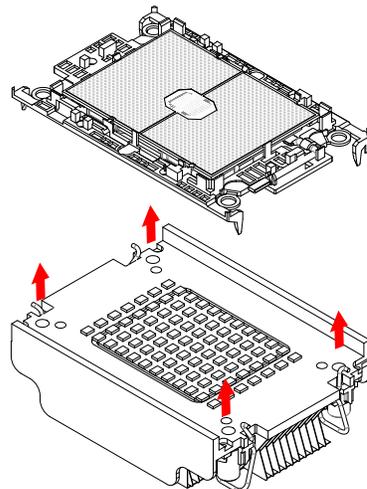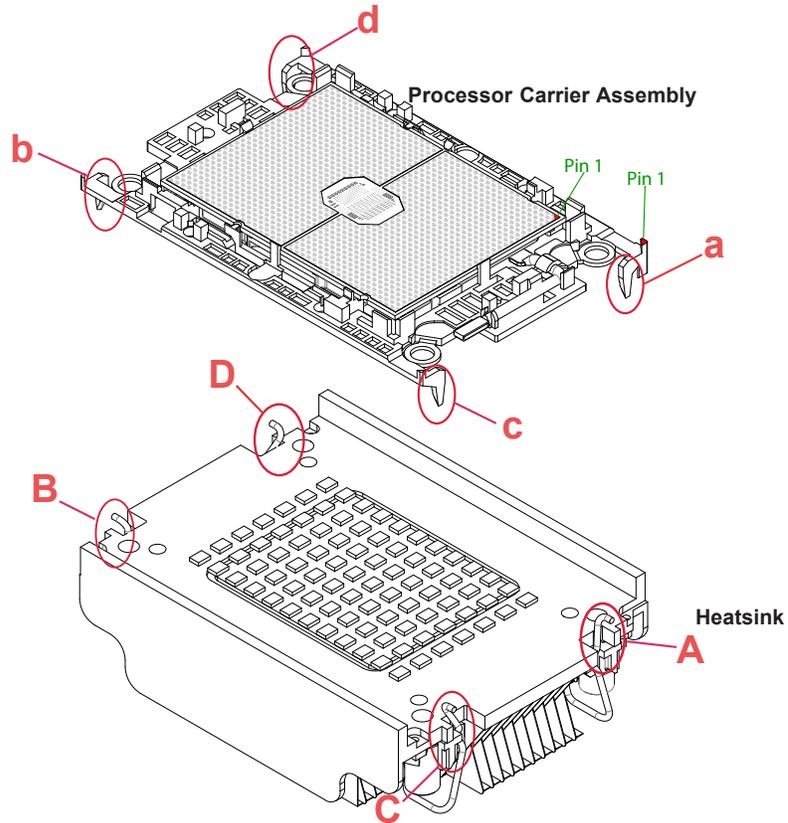
Removing the Processor from the Carrier Assembly

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

Processor Carrier Assembly

Lever
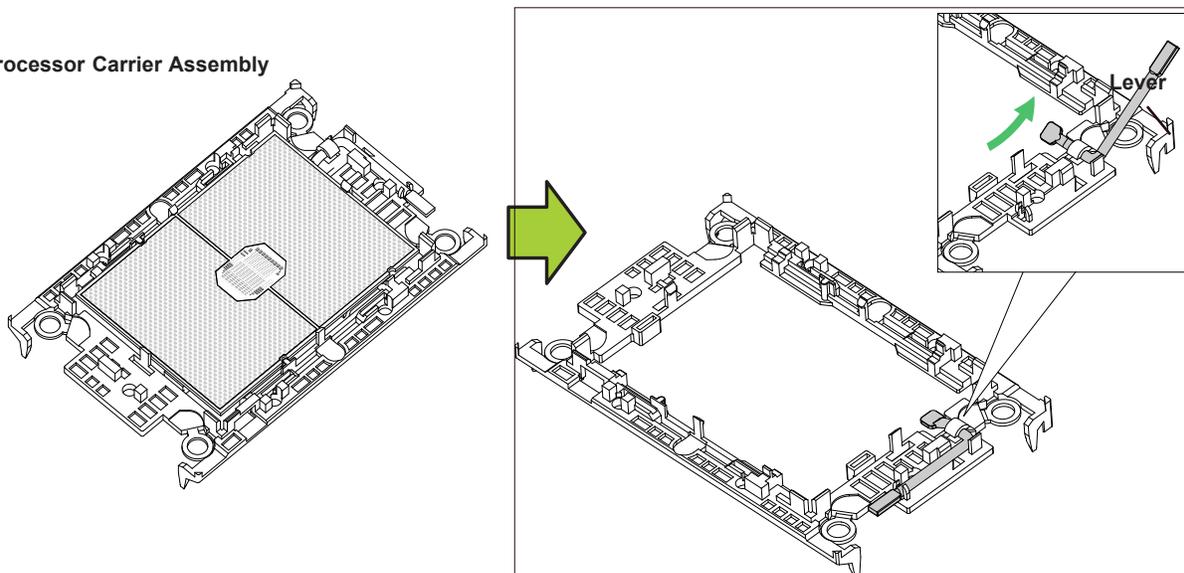
Note: Handle the processor with care to avoid damage.
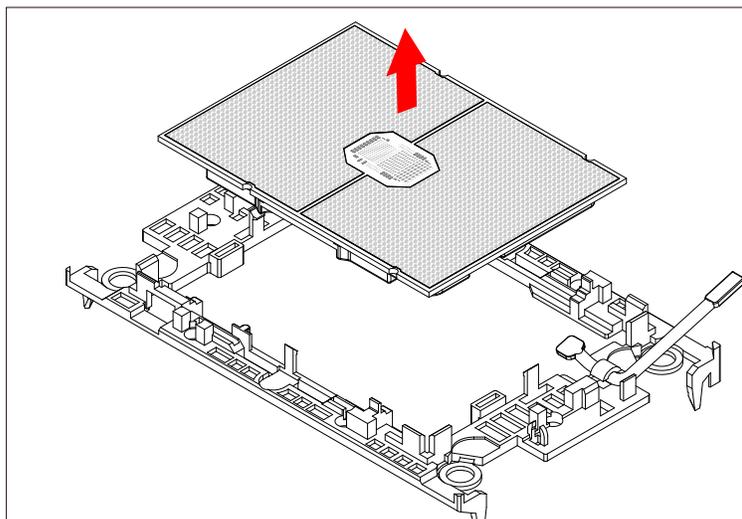
3.4 Memory

Memory Support

The X12DPU-6 motherboard has 32 DIMM slots. It supports up to

- 8TB (DDR4 only): 3DS Load Reduced DIMM (3DS LRDIMM), 3DS Registered DIMM (3DS RDIMM), or Non-Volatile DIMMs (NV-DIMM) ECC memory with speeds of up to 3200 MHz.

- 12TB (PMem + DDR4): 8TB of Intel Optane PMem 200 series (on Platinum, Gold and selected Silver processors only) plus 4TB of DDR4.

For validated memory, use our Product Resources page.

DDR4 Memory Support for 83xx/63xx/53xx/43xx Processors					
Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s) and Voltage	
		DRAM Density		One DIMM per Channel	Two DIMMs per Channel
		8Gb	16Gb	1.2V	1.2V
RDIMM	SRx8	8GB	16GB	3200*	3200*
	SRx4	16GB	32GB		
	DRx8	16GB	32GB		
	DRx4	32GB	64GB		
RDIMM 3Ds	(4R/8R) x4	2H-64GB 4H-128GB	2H-128GB 4H-256GB		
LRDIMM	QRx4	64GB	128GB		
LRDIMM 3Ds	(4R/8R) x4	4H-128GB	2H-128GB 4H-256GB		

*Only the 83xx and 63xx series support 3200MT/s; for other processors, memory speed as supported by the CPU.
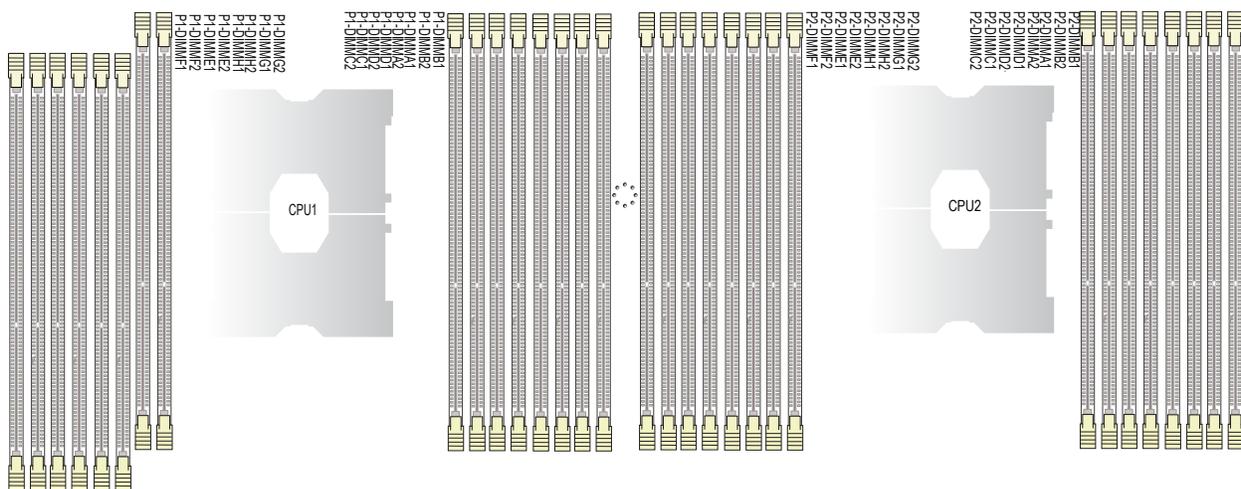
Figure 3-3. Memory Slots

Guidelines Regarding Mixing DIMMs

- All DIMMs must be DDR4 or a mixture of PMem and DDR4.

- x4 and x8 DIMMs can be mixed in the same channel.

- Mixing of LRDIMMs and RDIMMs is not allowed in the same channel, across different channels, and across different sockets.

- Mixing of non-3DS and 3DS LRDIMM is not allowed in the same channel, across different channels, and across different sockets.

- Mixing of PMem modules and RDIMMs is supported

- Mixing DDR4 and PMem memory operating frequencies is not validated within a socket or across sockets. If DIMMs of different frequencies are mixed in the same channel, all DIMs will run at the highest common frequency.

- Always populate the DIMM with the higher electrical loading on a channel in DIMMx1 (farther from CPU) followed by DIMMx2.

DDR4 Memory Population Guidelines

The following memory population table was created based on guidelines provided by Intel to support Supermicro motherboards.

Memory Population for DDR4-only Configurations, 32 DIMM Slots	
CPUs/DIMMs	**DIMM Slots**
2 CPUs & 2 DIMMs*	CPU1: A1 CPU2: A1
2 CPUs & 4 DIMMs*	CPU1: A1, E1 CPU2: A1, E1
2 CPUs & 6 DIMMs	CPU1: A1, C1, E1, G1 CPU2: A1, E1
2 CPUs & 8 DIMMs*	CPU1: A1, C1, E1, G1 CPU2: A1, C1, E1, G1
2 CPUs & 10 DIMMs	CPU1: A1, B1, C1, E1, F1, G1 CPU2: A1, C1, E1, G1
2 CPUs & 12 DIMMs*	CPU1: A1, B1, C1, E1, F1, G1 CPU2: A1, B1, C1, E1, F1, G1
2 CPUs & 14 DIMMs	CPU1: A1, B1, C1, D1, E1, F1, G1, H1 CPU2: A1, B1, C1, E1, F1, G1
2 CPUs & 16 DIMMs*	CPU1: A1, B1, C1, D1, E1, F1, G1, H1 CPU2: A1, B1, C1, D1, E1, F1, G1, H1
2 CPUs & 18 DIMMs	CPU1: A1, A2, B1, C1, C2, D1, E1, E2, F1, G1, G2, H1 CPU2: A1, B1, C1, E1, F1, G1
2 CPUs & 20 DIMMs	CPU1: A1, A2, B1, C1, C2, D1, E1, E2, F1, G1, G2, H1 CPU2: A1, B1, C1, D1, E1, F1, G1, H1
2 CPUs & 22 DIMMs	CPU1: A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1, G2, H1, H2 CPU2: A1, B1, C1, E1, F1, G1
2 CPUs & 24 DIMMs*	CPU1: A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1, G2, H1, H2 CPU2: A1, B1, C1, D1, E1, F1, G1, H1
2 CPUs & 28 DIMMs	CPU1: A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1, G2, H1, H2 CPU2: A1, A2, B1, C1, C2, D1, E1, E2, F1, G1, G2, H1
2 CPUs & 32 DIMMs*	CPU1: A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1, G2, H1, H2 CPU2: A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1, G2, H1, H2

* recommended for optimal performance

- Other Intel validated memory configurations are supported, although they may not provide optimal performance. See Intel documentation for more information.

- Must have at least one DIMM per CPU.

Optane PMem 200 Series

For 3rd Gen Intel Xeon Scalable Platinum, Gold and selected Silver processors

Symmetric Population for Each CPU with PMem + DDR4																		
DDR4 & PMem	Modes	AD interleve	DIMM															
			F1	F2	E1	E2	H1	H2	G1	G2	C2	C1	D2	D1	A2	A1	B2	B1
4 DDR4 4 PMem	AD MM	1 - x4	PM	-	DDR4	-	PM	-	DDR4	-	-	DDR4	-	PM	-	DDR4	-	PM
		1 - x4	DDR4	-	PM	-	DDR4	-	PM	-	-	PM	-	DDR4	-	PM	-	DDR4
6 DDR4 1 PMem	AD	One - x1	DDR4	-	DDR4	-	-	-	DDR4	-	-	DDR4	-	PM	-	DDR4	-	DDR4
			-	-	DDR4	-	DDR4	-	DDR4	-	-	DDR4	-	DDR4	-	DDR4	-	PM
			DDR4	-	DDR4	-	PM	-	DDR4	-	-	DDR4	-	-	-	DDR4	-	DDR4
			PM	-	DDR4	-	DDR4	-	DDR4	-	-	DDR4	-	DDR4	-	DDR4	-	-
			DDR4	-	DDR4	-	DDR4	-	-	-	-	PM	-	DDR4	-	DDR4	-	DDR4
			DDR4	-	-	-	DDR4	-	DDR4	-	-	DDR4	-	DDR4	-	PM	-	DDR4
			DDR4	-	DDR4	-	DDR4	-	PM	-	-	-	-	DDR4	-	DDR4	-	DDR4
			DDR4	-	PM	-	DDR4	-	DDR4	-	-	DDR4	-	DDR4	-	-	-	DDR4
8 DDR4 1 PMem	AD	One - x1	DDR4	-	DDR4	-	DDR4	-	DDR4	-	-	DDR4	-	DDR4	PM	DDR4	-	DDR4
			DDR4	-	DDR4	-	DDR4	-	DDR4	-	PM	DDR4	-	DDR4	-	DDR4	-	DDR4
			DDR4	-	DDR4	PM	DDR4	-	DDR4	-	-	DDR4	-	DDR4	-	DDR4	-	DDR4
			DDR4	-	DDR4	-	DDR4	-	DDR4	PM	-	DDR4	-	DDR4	-	DDR4	-	DDR4
			DDR4	-	DDR4	-	DDR4	-	DDR4	-	-	DDR4	PM	DDR4	-	DDR4	-	DDR4
			DDR4	-	DDR4	-	DDR4	-	DDR4	-	-	DDR4	-	DDR4	-	DDR4	PM	DDR4
			DDR4	PM	DDR4	-	DDR4	-	DDR4	-	-	DDR4	-	DDR4	-	DDR4	-	DDR4
			DDR4	-	DDR4	-	DDR4	PM	DDR4	-	-	DDR4	-	DDR4	-	DDR4	-	DDR4
8 DDR4 4 PMem	AD MM	1 - x4	DDR4	-	DDR4	PM	DDR4	-	DDR4	PM	PM	DDR4	-	DDR4	PM	DDR4	-	DDR4
		2 - x2	DDR4	-	DDR4	PM	DDR4	PM	DDR4	-	-	DDR4	PM	DDR4	PM	DDR4	-	DDR4
		1 - x4	DDR4	PM	DDR4		DDR4	-	DDR4	PM	PM	DDR4	-	DDR4	-	DDR4	PM	DDR4
		2 - x2	DDR4	PM	DDR4	-	DDR4	PM	DDR4	-	-	DDR4	PM	DDR4	-	DDR4	PM	DDR4
8 DDR4 8 PMem	AD MM	One - x8	DDR4	PM	DDR4	PM	DDR4	PM	DDR4	PM	PM	DDR4	PM	DDR4	PM	DDR4	PM	DDR4
12 DDR4 2 PMem	AD	One - x2	PM	-	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	-	PM
			DDR4	DDR4	DDR4	DDR4	PM	-	DDR4	DDR4	DDR4	DDR4	-	PM	DDR4	DDR4	DDR4	DDR4
			DDR4	DDR4	PM	-	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	-	PM	DDR4	DDR4	DDR4
			DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	PM	-	-	PM	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4

AD: App Direct, MM: Memory Mode, PM: PMem

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

PMem Notes

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

- Do not mix PMem and NVDIMMs within the platform.

- 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 and MM + AD modes.

- For each individual population, different PMem rearrangements among channels are permitted so long as the configuration does not 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 config, then the system issues a BIOS warning. The CLI functionality is limited in non-POR configurations, and select commands will not be supported.

- x4 and x8 DDR4 DIMMs cannot be mixed in the same channel in PMem configurations.

Installing Memory

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

• Use a grounded wrist strap designed to prevent static discharge.

• Handle the memory module by its edges only.

• Put the memory modules into the antistatic bags when not in use.

Installing Memory

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

1. Push the release tabs outwards on both ends of the DIMM slot to unlock it.
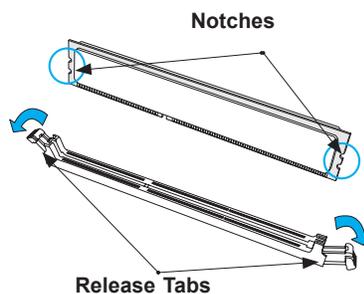
2. Align the key of the DIMM with the receptive point on the memory slot and with your thumbs on both ends of the module, press it straight down into the slot until the module snaps into place.
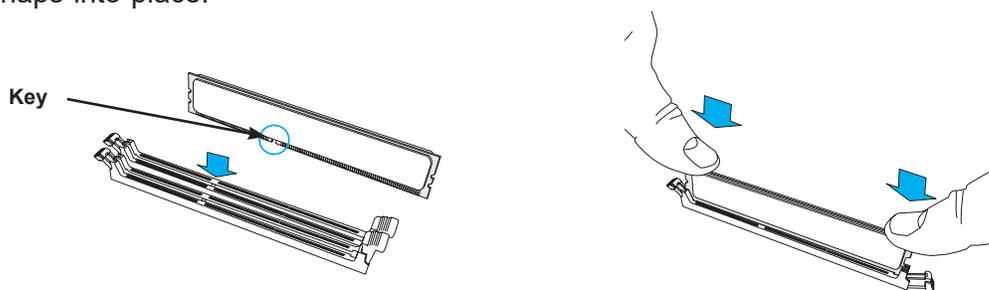
3. Press the release tabs to the locked position to secure the DIMM module into the slot.

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

Removing Memory

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

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 power 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.

LITHIUM BATTERY

BATTERY HOLDER
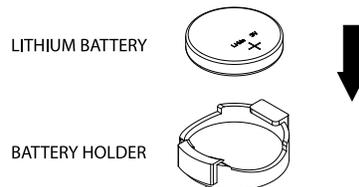
Figure 3-4. Installing the Onboard Battery

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

3.6 Storage Drives

The system supports twelve hot-swap 3.5" hybrid storage drive bays For compatible drives, see the X12DPU-6 motherboard page. **Note**: In systems using a CPU with greater than 205W TDP or GPU cards, HDDs may experience reduced performance. SSD drives are recommended for these configurations.

The drives are mounted in tool-less drive carriers that simplify their removal from the chassis. These carriers also help promote proper airflow.

Note: Enterprise level hard disk drives are recommended for use in Supermicro chassis and servers. For information on recommended HDDs, visit the Supermicro website product pages at https://www.supermicro.com/products/nfo/Ultra.cfm.

Installing Drives

Figure 3-5. Logical Drive Numbers

Removing a Hot-Swap Drive Carrier from the Chassis

1. Press the release button on the drive carrier, which will extend the drive carrier handle.

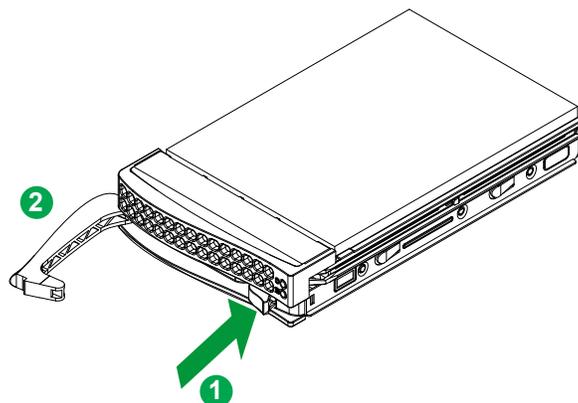2. Use the drive carrier handle to pull the drive out of the chassis.

Figure 3-6. Removing a Drive Carrier

Installing a 3.5" Drive

1. Remove the dummy drive, which comes pre-installed in the drive carrier. Pull out the two locking clasps on the right outside of the carrier and lift out the dummy drive.

2. Position the drive above the carrier with the PCB side facing down and the connector end toward the rear of the carrier.
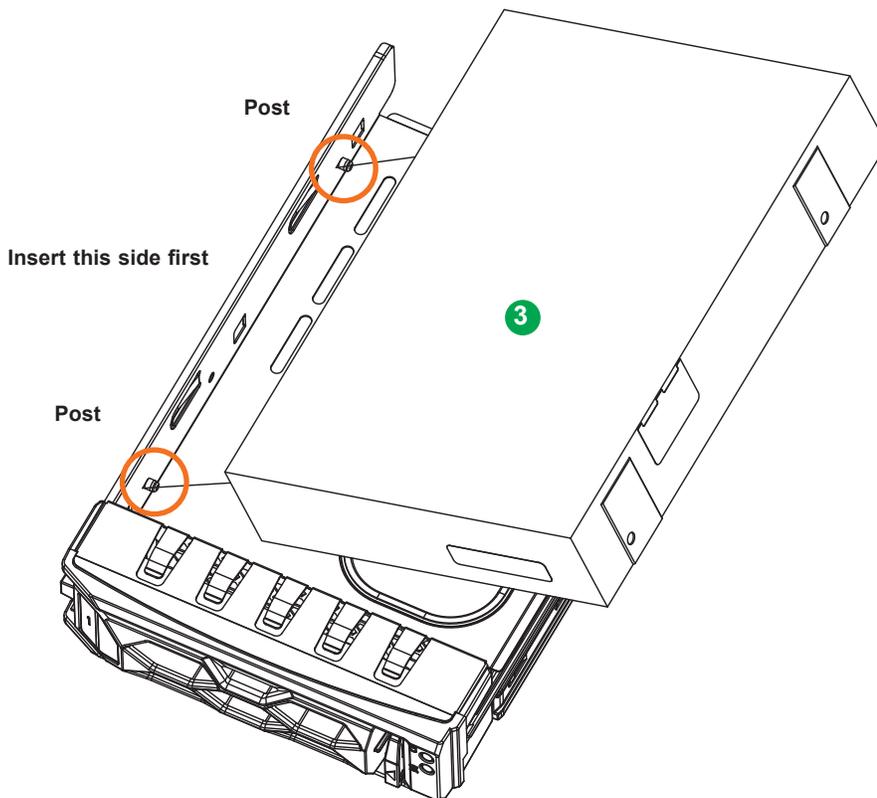
Figure 3-7. Installing a 3.5" Drive into a Carrier

3. Tilt the drive to insert it onto the two posts on the left inside of the carrier.

4. Push the right side of the drive fully into the carrier and allow the two spring locking clasps to secure the drive.

5. Insert the drive carrier into its bay, keeping the release button on the right. When the carrier reaches the rear of the bay, the release handle will retract.

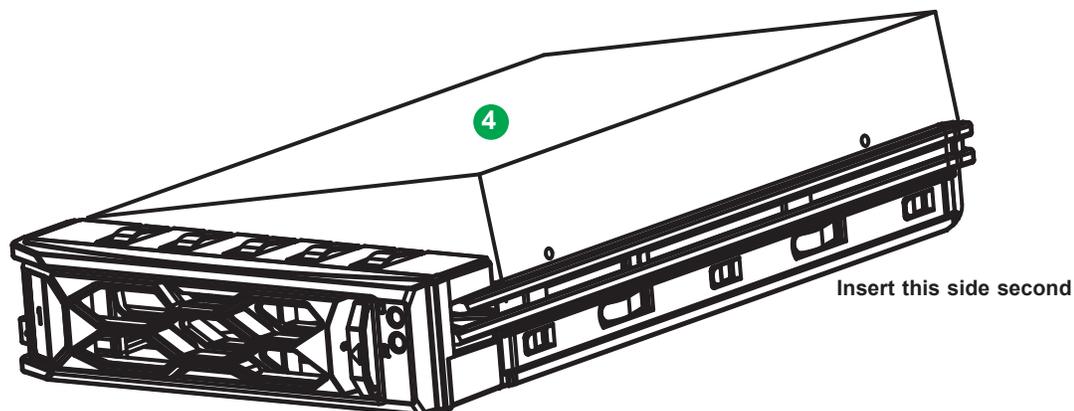6. Push the handle in until it clicks into its locked position

Insert this side second

Figure 3-8. Installing a 3.5" Drive into a Carrier

Checking the Temperature of an NVMe Drive

There are two ways to check using the BMC Dashboard.

Checking a Drive

- **BMC Dashboard > Server Health > NVMe SSD –** Shows the temperatures of all NVMe drives.

- **BMC Dashboard > Server Health > Sensor Reading > NVME_SSD –** Shows the single highest temperature among all the NVMe drives.

Hot-Swap for NVMe Drives

Supermicro Ultra servers support NVMe surprise hot-swap. For even better data security, NVMe orderly hot-swap is recommended. NVMe drives can be ejected and replaced remotely using the BMC Dashboard.

Note: If you are using VROC, see the <u>VROC section</u> in this manual instead.

Ejecting a Drive

1. **BMC Dashboard > Server Health > NVMe SSD**

2. Select Device, Group and Slot, and click **Eject**. After ejecting, the drive Status LED indicator turns green.

3. Remove the drive.

Note that *Device* and *Group* are categorized by the CPLD design architecture.

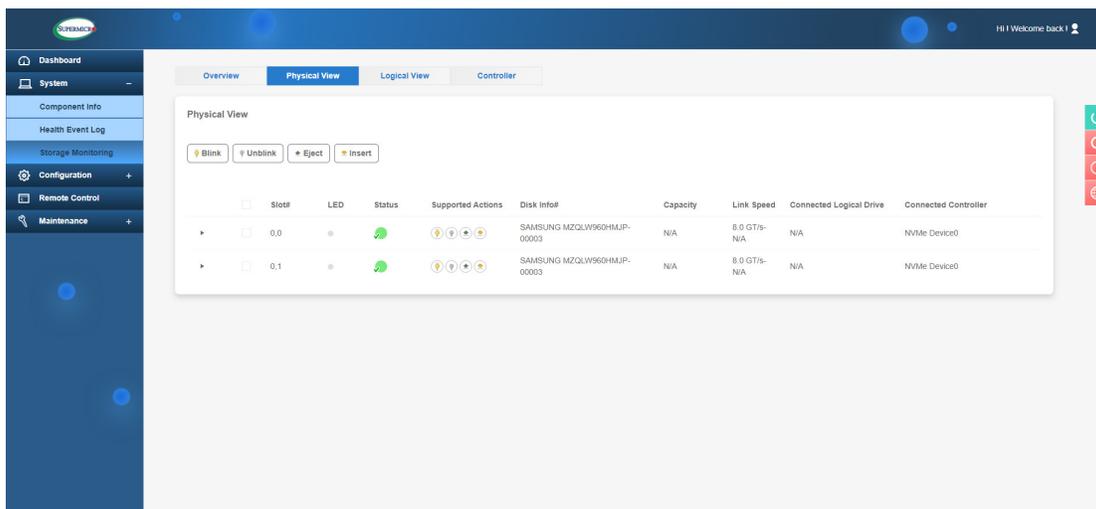*Slot* is the slot number on which the NVMe drives are mounted.

Figure 3-9. BMC Dashboard Screenshot

Replacing the Drive

1. Insert the replacement drive.

2. **BMC Dashboard > Server Health > NVMe SSD**

3. Select Device, Group and slot and click **Insert**. The drive Status LED indicator flashes red, then turns off. The Activity LED turns blue.

3.7 System Cooling

Fans

The chassis contains four 8-cm high-performance fans. Fan speed is controlled by the BMC depending on the system temperature. If a fan fails, the remaining fans will ramp up to full speed. The system will continue to run with a failed fan, although it may shut down if the heat gets too great. Replace any failed fan at your earliest convenience with the same model. Failed fans can be identified through the BMC.

Changing a System Fan

1. Determine which fan has failed using the BMC, or if necessary, open the chassis while the system is running. Never run the server for long without the chassis cover.

2. Push the release tab and pull the failed fan from the chassis. Fans can be replaced while the system is running.

3. Replace the failed fan with an identical fan, available from Supermicro. Push the new fan into the housing, making sure the air flow direction is the same.

4. Power up the system and check that the fan is working properly and that the LED on the control panel has turned off. Finish by replacing the chassis cover.
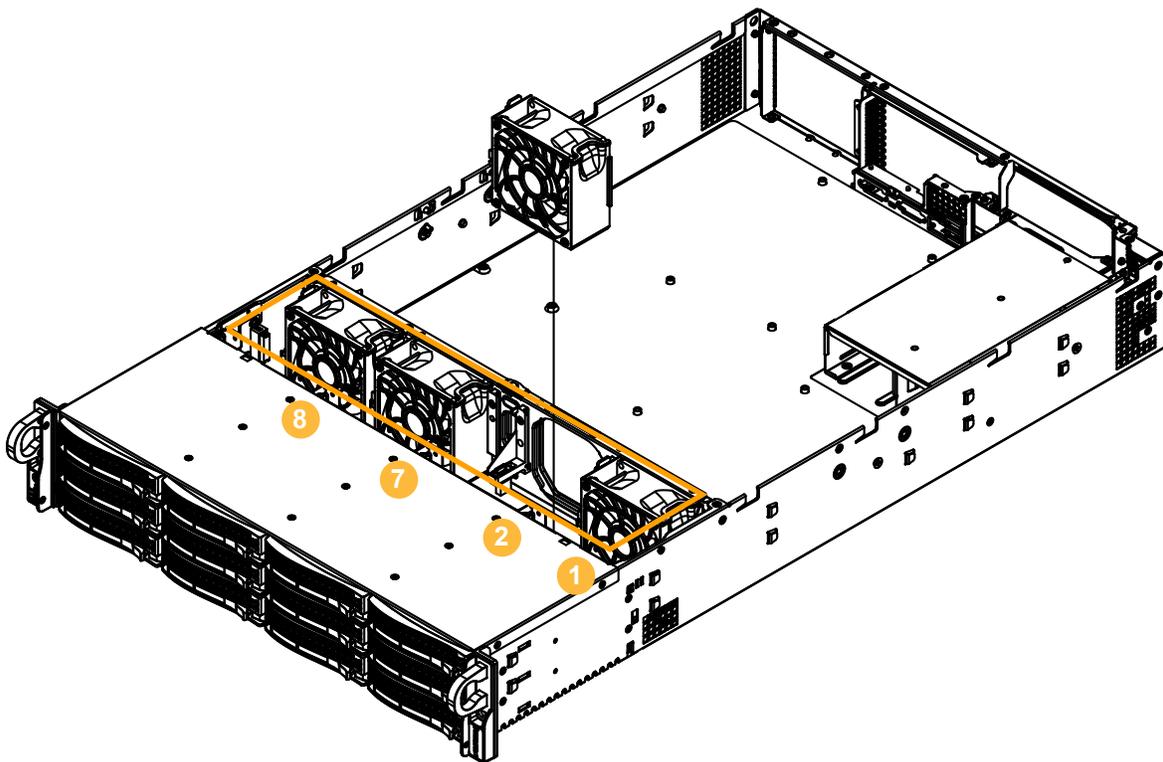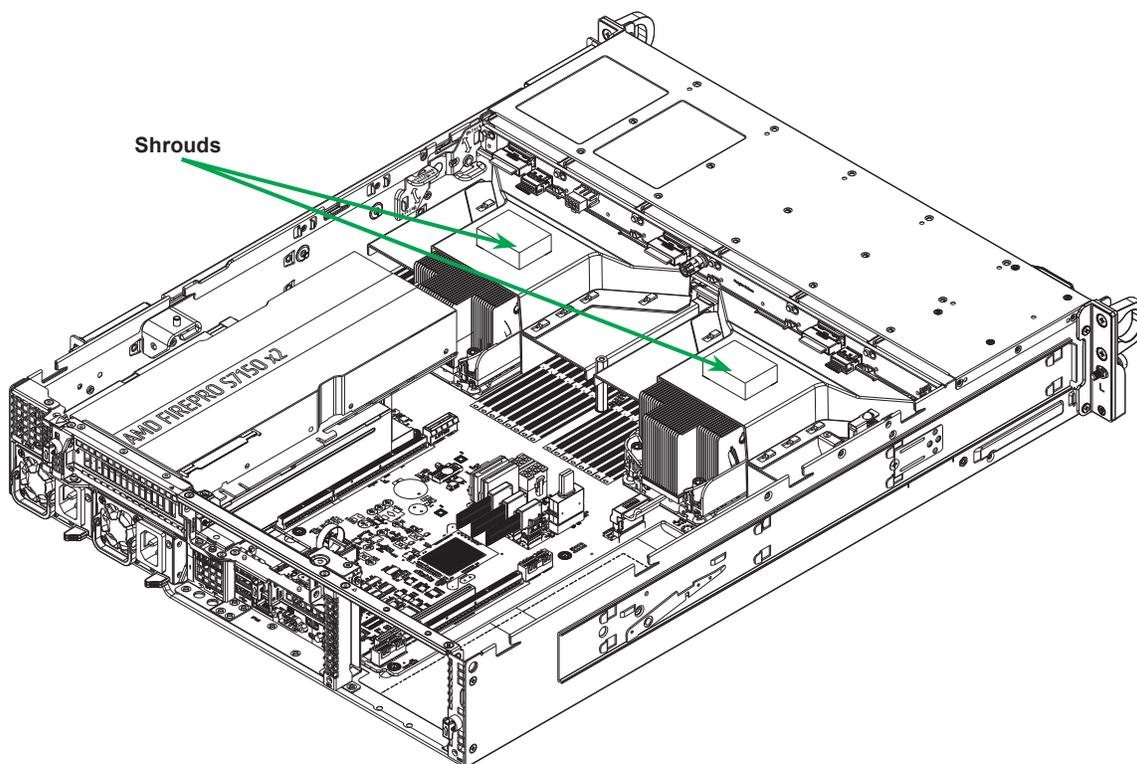

Figure 3-10. Fan Positions and Numbering

Air Shrouds

Air shrouds concentrate airflow to maximize fan efficiency. They do not require screws to install.

Installing the Standard Air Shrouds

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

Figure 3-11. Installing the Standard Air Shrouds

3.8 Power Supply

The chassis features redundant power supplies. The system will continue to operate if one module fails. It should be replaced as soon as convenient. The power supply modules are hot-swappable, meaning they can be changed without powering down the system. New units can be ordered directly from Supermicro or authorized distributors.

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

Power Supply LEDs

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

- **Solid Green**: When illuminated, indicates that the power supply is on.

- **Blinking Green**: When blinking, indicates that the power supply is plugged in and turned off by the system.

- **Blinking Amber:** When blinking, indicates that the power supply has a warning condition and continues to operate.

- **Solid Amber**: When illuminated, indicates that the power supply is plugged in, and is in an abnormal state. The system might need service. Please contact Supermicro technical support.

Changing the Power Supply Module:

1. Unplug the AC cord from the module to be replaced.

2. On the back of the module, push the release tab sideways, as illustrated.

3. Pull the module out using the handle.

4. Push the new power supply module into the power bay until it clicks. Replace with the same model.

5. Plug the AC power cord back into the module.

Figure 3-12. Replacing the Power Supply

3.9. PCI Expansion Slots

This system offers options for riser cards that provide custom PCIe capabilities—one Ultra Riser card, one right-facing WIO riser card, and one left-facing WIO card.
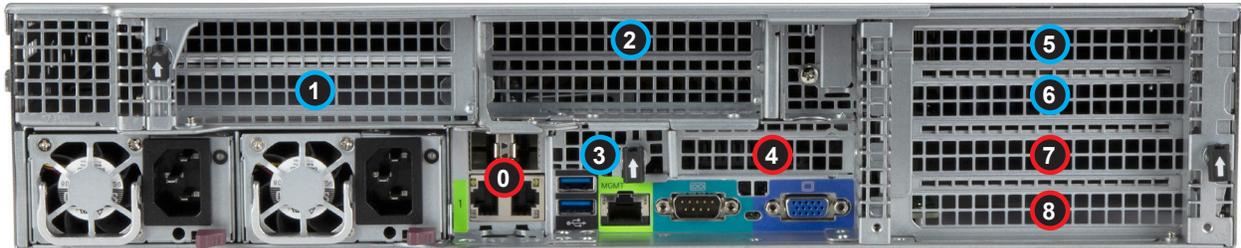

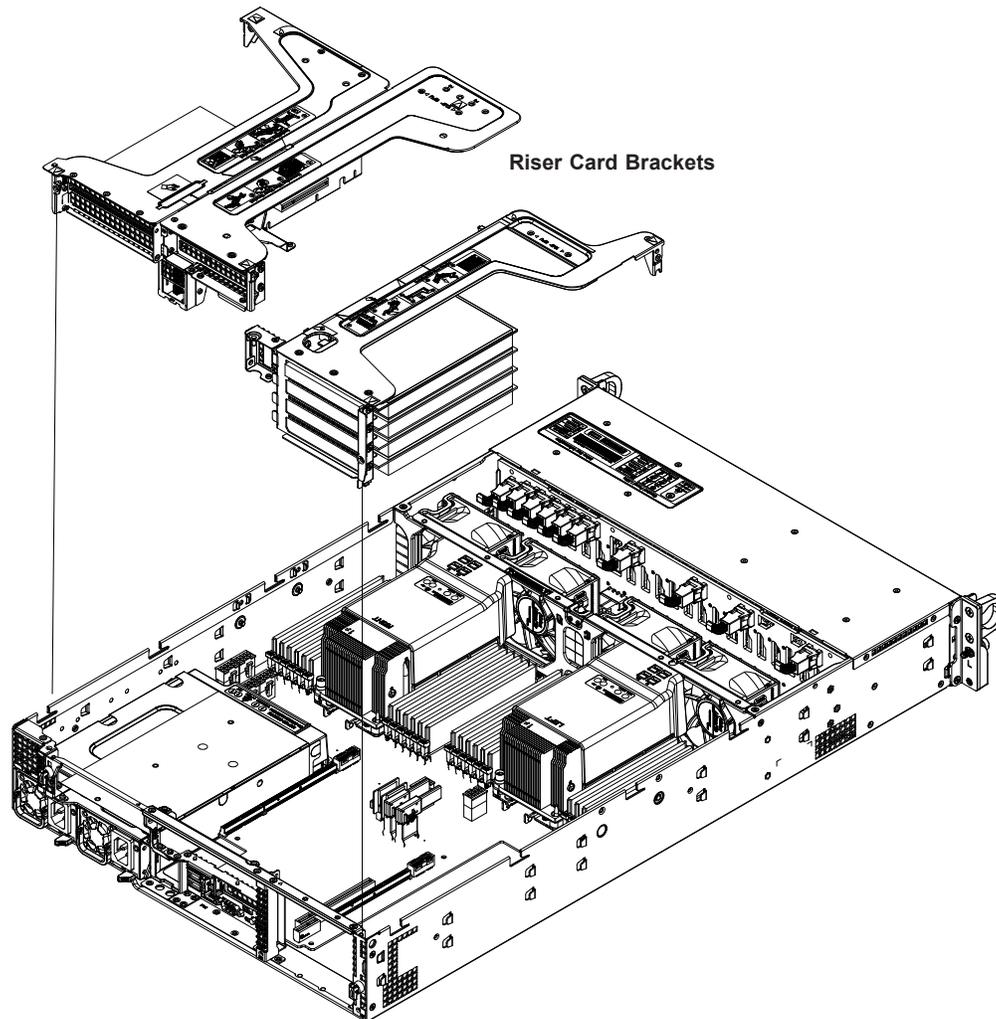**Figure 3-13. Expansion Card Chassis Slots**

PCIe Slots per Riser Card			
Riser Card	**Part Number**	**Slot**	**Description (all PCIe 4.0)**
Ultra Riser card	AOC-2UR668G4	1 2 3	x16 FH, 10.5"L, 75W (CPU2) x16 FH, 10.5"L, 75W (CPU2) x8 (in x16), Internal LP, 75W (CPU1)
	AOC-2UR68G4-i2XT AOC-2UR68G4-i4XTS AOC-2UR68G4-m2TS	1 2 3	x16 FH, 10.5"L, 75W (CPU2) x8 (in x16) FH, 10.5"L, 75W (CPU2) x8 (in x16) Internal LP, 75W (CPU2)
Right-facing	RSC-WR-6	4	x16 low profile, 75W (CPU1)
Left-facing	RSC-W2-8888G4	5 6 7 8	x8 FH, 10.5"L, 25W (CPU2) x8 FH, 10.5"L, 25W (CPU2) x8 FH, 10.5"L, 25W (CPU1) x8 FH, 10.5"L, 25W (CPU1)
	RSC-W2-688G4	5 7 8	x16 FH, 10.5"L, 75W (CPU2) x8 (in x16) FH, 10.5"L, 75W (CPU1) x8 (in x16) FH, 10.5"L, 75W (CPU1)
	RSC-W2-66G4	5 7	x16 FH, 10.5", 75W (CPU2) x16 FH, 10.5", 75W (CPU1)

One riser card slot may be used for a controller card that supports SAS. Up to three slots may be used for retimer cards to support NMVe drive bays.

The x16 slots can be enabled as *high power*, and can support up to 75W. Power greater than 75W must be supplied by an auxiliary power source.

The Ultra Riser card interface has a limit of 13A on 12V. A maximum of two 75W cards and one 25W card can be supported in Slots 1-3 at the same time.

Installing Full Height Expansion Cards

Figure 3-14. Installing Expansion Cards

Installing PCI Expansion Cards

1. Power down the system and remove the top chassis cover.

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

3. Insert the expansion card(s) into the riser card slot(s) while aligning the rear PCI shield.

4. Replace the riser card into the motherboard expansion slot while aligning the bracket into the chassis. Flip the black plastic lever back in place, making sure it snaps closed with a click.

5. Replace the chassis cover.
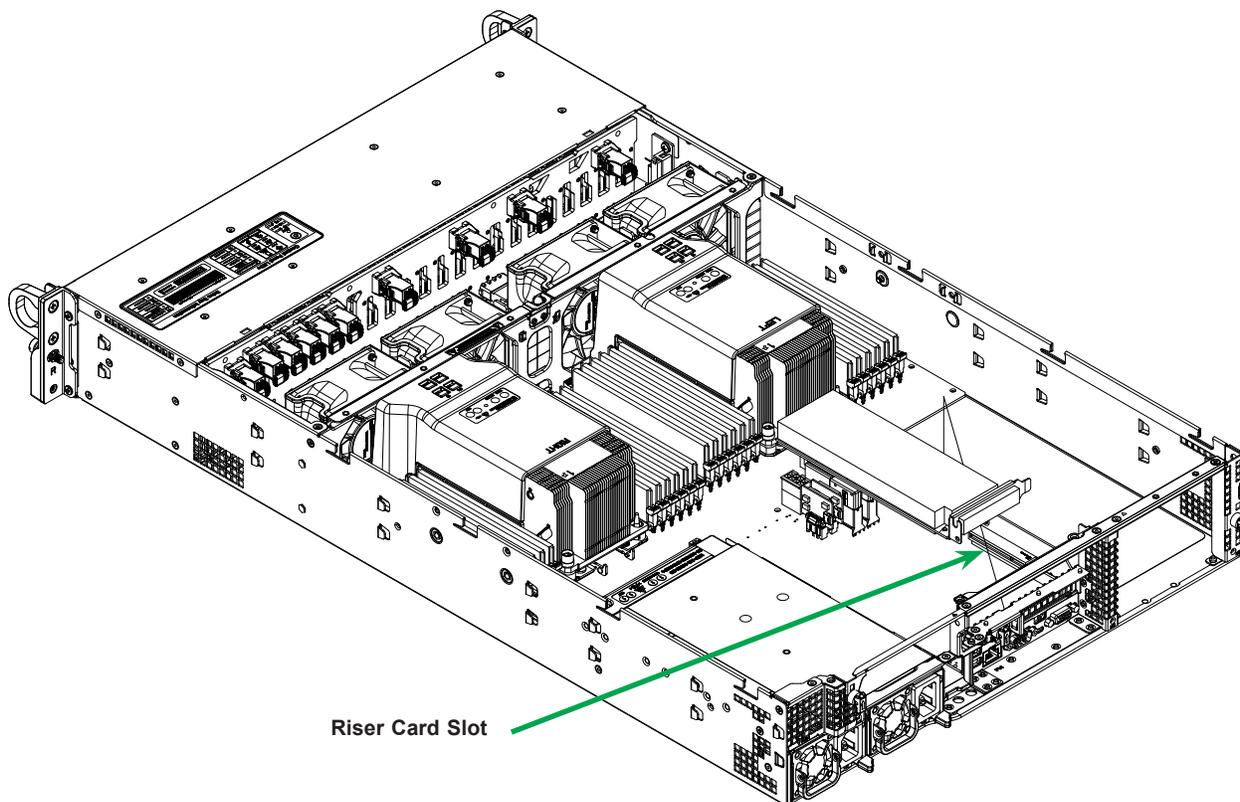
Installing the Low Profile Center Expansion Card

Figure 3-15. Installing Low Profile Expansion Card

Installing the Low Profile PCI Expansion Card (❹)

1. Power down the system and remove the top chassis cover.

2. If necessary, remove the full height expansion card to access the low profile riser card slot, pictured above.

3. Insert the expansion card into the riser card slot while aligning the rear PCI shield into the chassis. Add the screw to secure the PCI shield.

4. Replace the full height expansion card above the low profile card if necessary, then replace the chassis cover.

Installing the Internal Expansion Card

For most models, the Ultra riser card that holds the LAN ports also offers another internal low profile card slot (**3**). Installation is pictured below.

View from Front
of Chassis

Thumb Screw to
Secure Bracket

Internal Expansion
Card

View from Rear
of Chassis
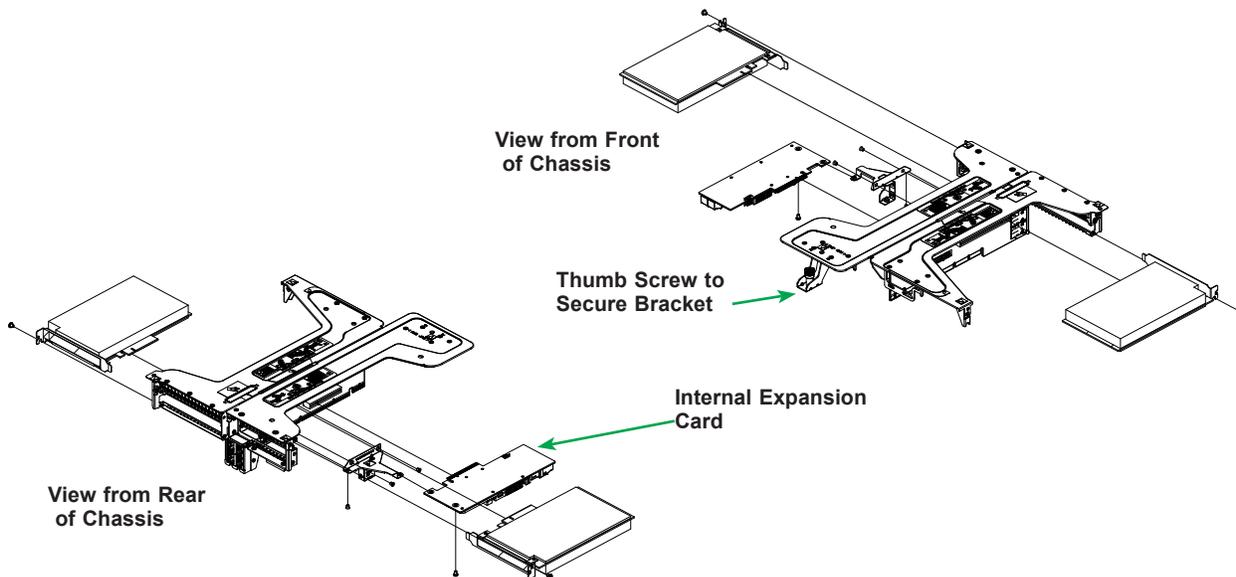
Figure 3-16. Ultra Riser Bracket and Expansion Cards

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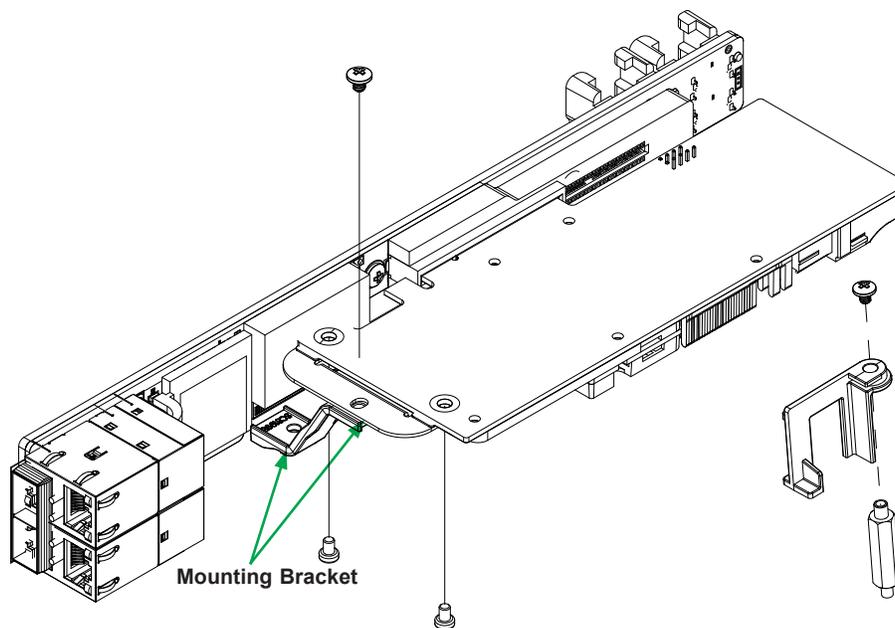
Mounting Bracket

Figure 3-17. Bracket for Mounting an Internal Expansion Card on the Ultra Riser Card
(four-port Ultra card shown in this example)