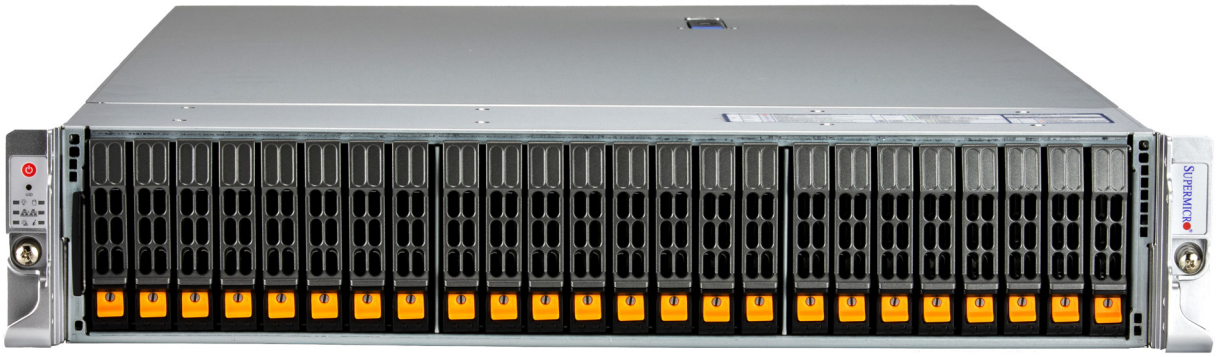
SuperServer®
SYS-220H-TN24R



USER'S MANUAL

Revision 1.0a

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Manual Revision 1.0a

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Preface

About this Manual

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

Please refer to the SYS-220H-TN24R 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

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

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

Secure Data Deletion

A secure data deletion tool designed to fully erase all data from storage devices can be found on our website: https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wdl/utility/Log9_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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Contacting Supermicro

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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-220H-TN24R. The system uses a backplane which supports 24 drive bays which can be enabled for NVMe, SAS and SATA drive support.

The following provides an overview of the specifications and capabilities of the SYS-220H-TN24R.

System Overview	
Motherboard	X12DHM-6
Chassis	CSE-HS219-R1K63P
Processor Support	Dual 3rd Generation Intel® Xeon® Scalable processors
Memory	32 DIMM slots for up to 8TB 3DS ECC DDR4-3200:LRDIMM/RDIMM (total 8TB) or 32 DIMM slots for up to 4TB 3DS ECC DDR4-3200:LRDIMM/RDIMM plus 8TB Intel® Optane™ PMem 200 Series (total 12TB) * **Note:** PMem 200 Series are supported on 3rd Gen Intel Xeon Scalable Platinum, Gold, and selected Silver processors
Drive Support	24 NVMe/SATA/SAS drive bays Two M.2 NVMe or two M.2 SATA3 slots on the motherboard
Expansion Slots	Optional eight PCIe 4.0 x8 slots or four PCIe 4.0 x16 slots
I/O Ports	One OCP 3.0 compatible slim AIOM slot (second slot optional) One RJ45 dedicated BMC LAN port Two rear USB 3.0 ports One VGA port
System Cooling	Four 8-cm heavy duty fans with optimal fan speed control Two air shrouds
Power	Two 1600W (Titanium Level 96%) redundant power supply
Form Factor	2U Rackmount 1.7 x 17.2 x 29.3in. / 43 x 437 x 746mm (HxWxD)

A Quick Reference Guide can be found on the product page of the Supermicro website. The following safety models associated with the SYS-220H-TN24R have been certified as compliant with UL or CSA: HS219-R12X12, HS219-R16X12, HS219-R26X12, HS219-R13DX12, HS219-R16DX12, HS219-12, HS219-16, HS219-26, HS219-13D, HS219-16D.

1.2 System Features

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

Front View



Figure 1-1. SYS-220H-TN24R Front View

System Features: Front	
Feature	**Description**
Control Panel	One control panel (see Control Panel for details)
Service Tag	Service Tag with BMC Password Reset

Logical Storage Drive Numbers	
Item	**Description**
0 _ 23	24 hot-swap 2.5" NVMe/SATA3/SAS3* drive bays

*NVMe, SATA3, or SAS3 support requires additional parts in optional parts list.

Control Panel

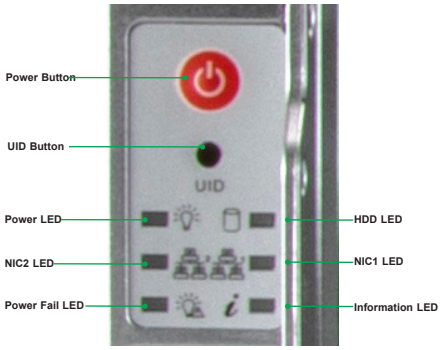


Figure 1-2. Control Panel

Control Panel Features	
Feature	**Description**
Power Button	The main power button is used to apply or remove power from the power supply to the server. Turning off system power with this button removes the main power but maintains standby power. To perform many maintenance tasks, you must also unplug the system before servicing.
UID Button	Use a pin to press the UID button
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
HDD LED	Indicates activity on a hard drive when flashing.
NIC2 LED	Indicates network activity on LAN port 2 when flashing.
NIC1 LED	Indicates network activity on LAN port 1 when flashing.
Power Fail LED	Indicates a power supply module has failed.
Universal Information LED	See table below for details.

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

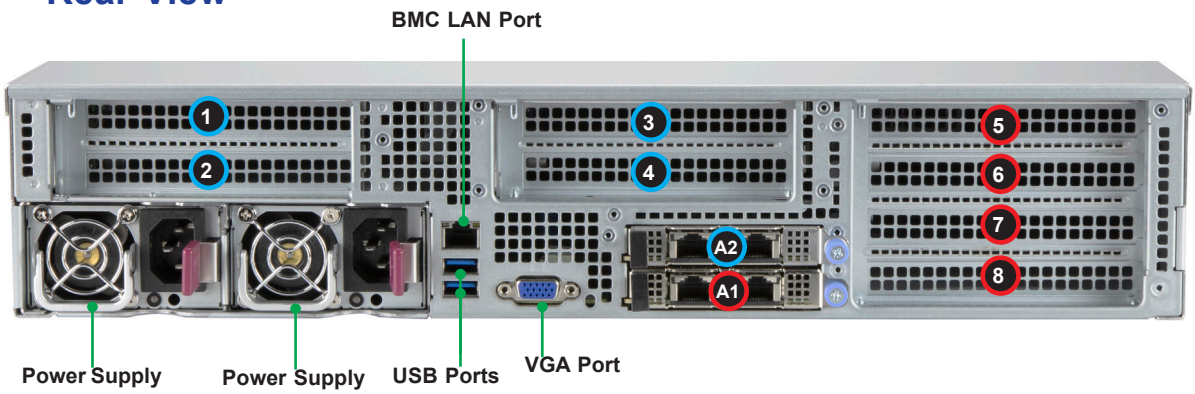


Figure 1-3. System: Rear View

System Features: Rear	
Feature	**Description**
Power Supplies	Two redundant power supply modules, PWS1 on the left, PWS2 on the right
USB	Two USB 3.0 ports
BMC LAN	One RJ45 dedicated BMC LAN port
VGA	One VGA port
A1	AIOM/OCP NIC 3.0 Slot
A2	Optional AIOM/OCP NIC 3.0 Slot
1 to 4	1 - Optional: PCIe 4.0 x8 (in x16) slot or PCIe 4.0 x16 slot (FH, 10.5”L) 2 - Optional: PCIe 4.0 x8 (in x16) slot (FH, 10.5”L) 3 - Optional: PCIe 4.0 x8 (in x16) slot or PCIe 4.0 x16 slot (FH, 10.5”L) 4 - Optional: PCIe 4.0 x8 (in x16) slot (FH, 10.5”L)
5 to 8	5 - PCIe 4.0 x8 (in x16) slot or optional: PCIe 4.0 x16 slot (FH, 10.5”L) 6 - PCIe 4.0 x8 (in x16) slot (FH, 10.5”L) 7 - PCIe 4.0 x8 (in x16) slot (FH, 10.5”L) 8 - PCIe 4.0 x8 (in x16) slot (FH, 10.5”L)

CPU1 CPU2

Note: Slots 5 to 8 are optional on SYS-220H-TN24R.

Power Supply Indicators		
Power Supply Condition	**Green LED**	**Amber LED**
No AC Power to Power Supply	OFF	OFF
Power Supply critical events causing a shutdown/ failure/ OCP/ OVP/ Fan Fail/ OTP/ UVP	OFF	Amber LED
Power Supply Warning Events Where the power supply continues to operate; High temperature; Over voltage; under voltage, etc.	OFF	1Hz Blink Amber
AC present only 12VSB ON (PS OFF)	1Hz Blink Green	OFF
Output ON and OK	Green	OFF
AC cord unplugged and in redundant mode	OFF	Amber

1.3 System Architecture

This section covers the locations of the system's main components, a system block diagram, and a motherboard layout with the connectors and jumpers called out.

Main Components

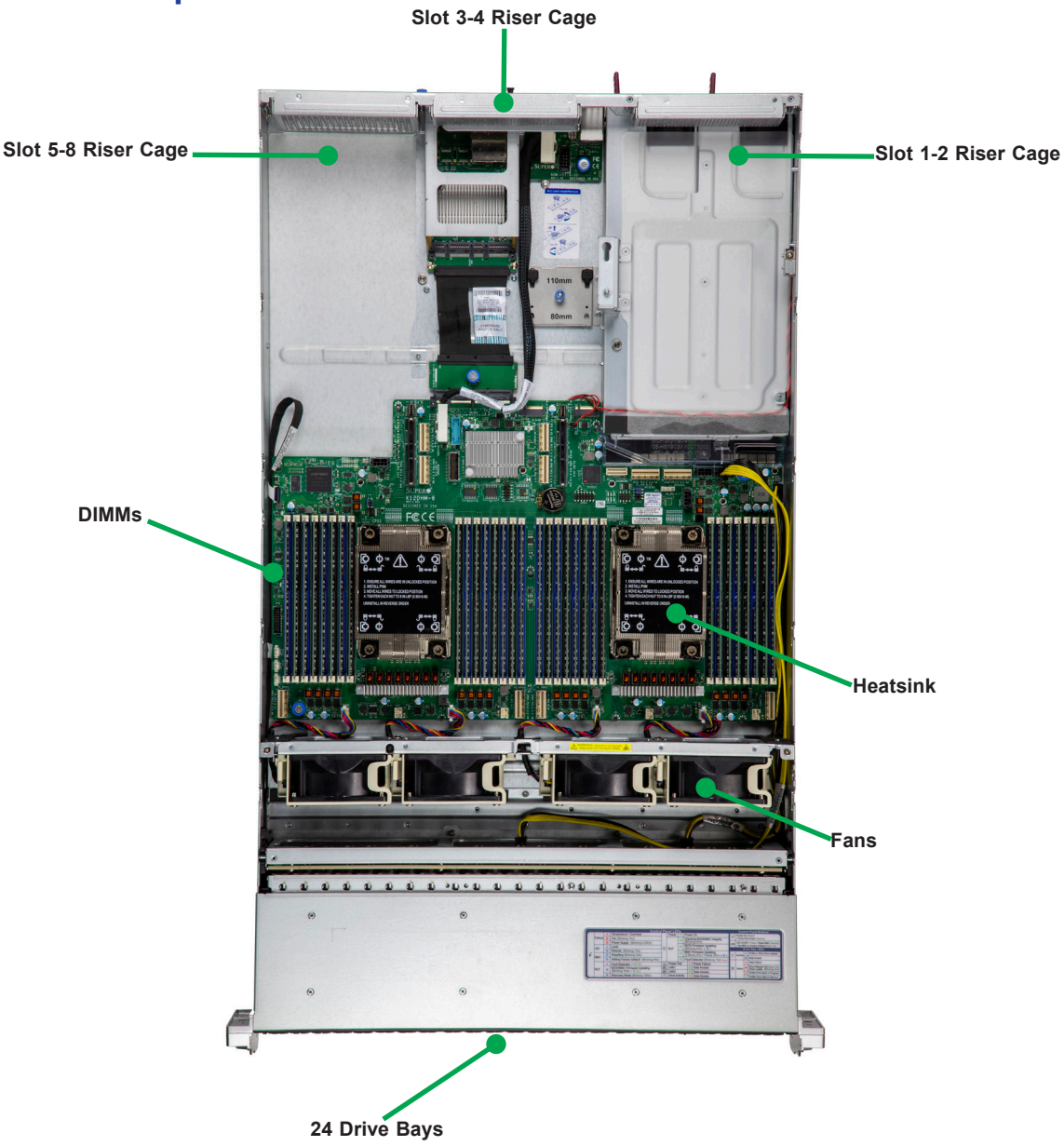


Figure 1-4. Main Component Locations

System Features: Top	
Feature	**Description**
Power Supply	Dual redundant modules, PWS-1K63A-1R
DIMM slots	32 DIMM memory slots
Processors	Dual Intel Xeon® Scalable Processors with heatsinks, SNK-P0078P
System Fans	Four 8-cm dual counter-rotating PWM fans, FAN-0223L4
Service Tag	Service tag with serial number / BMC ADMIN password
Backplane	24 SAS3/SATA3/NVMe4 storage device backplane, BPN-NVME4-HS219N-S24
Slot 1-2 Riser Cage	Optional riser Cage for riser card RSC-H2-68G4
Slot 3-4 Riser Cage	Optional riser Cage for riser card RSC-H2-68G4
Slot 5-8 Riser Cage	Riser Cage for with riser card RSC-H2-6888G4L (optional)

System Block Diagrams

The block diagrams below shows the connections and relationships between the subsystems and major components of SYS-220H-TN24R.

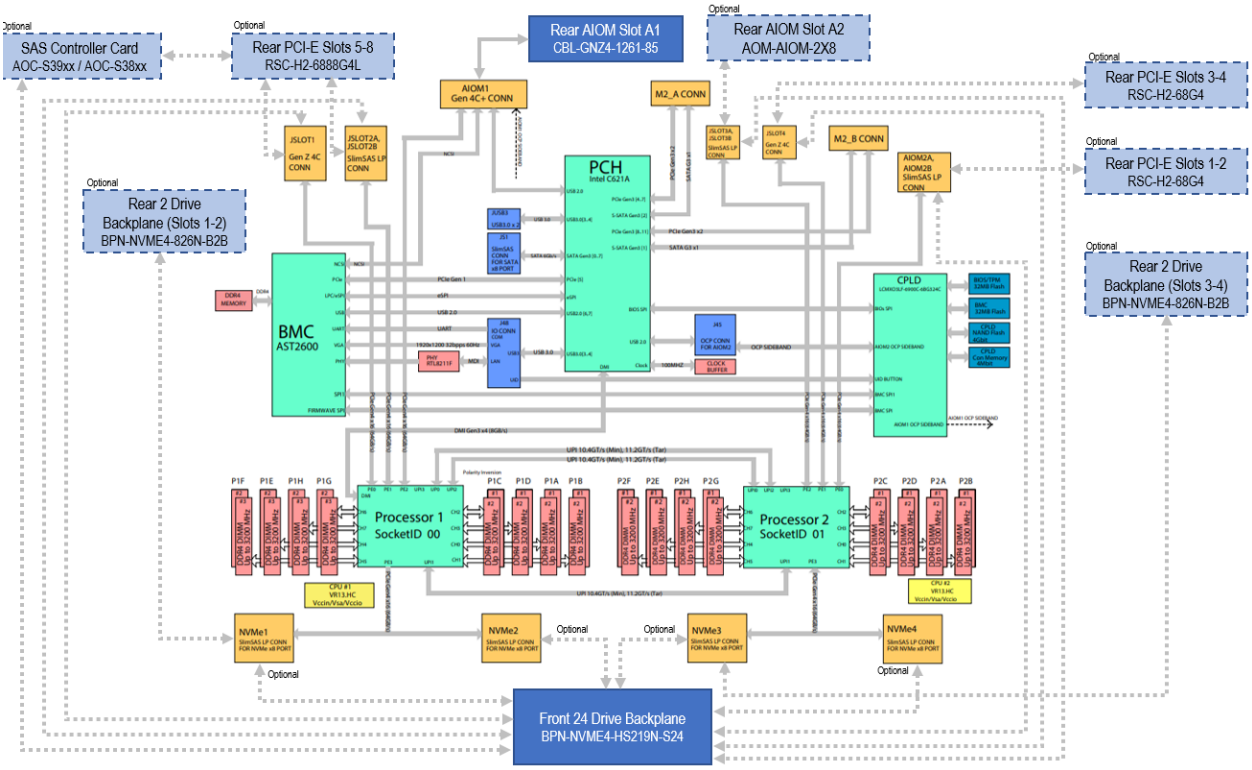


Figure 1-5. SYS-220H-TN24R Block Diagram

1.4 Motherboard Layout

Below is a layout of the X12DHM-6 motherboard with a 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.

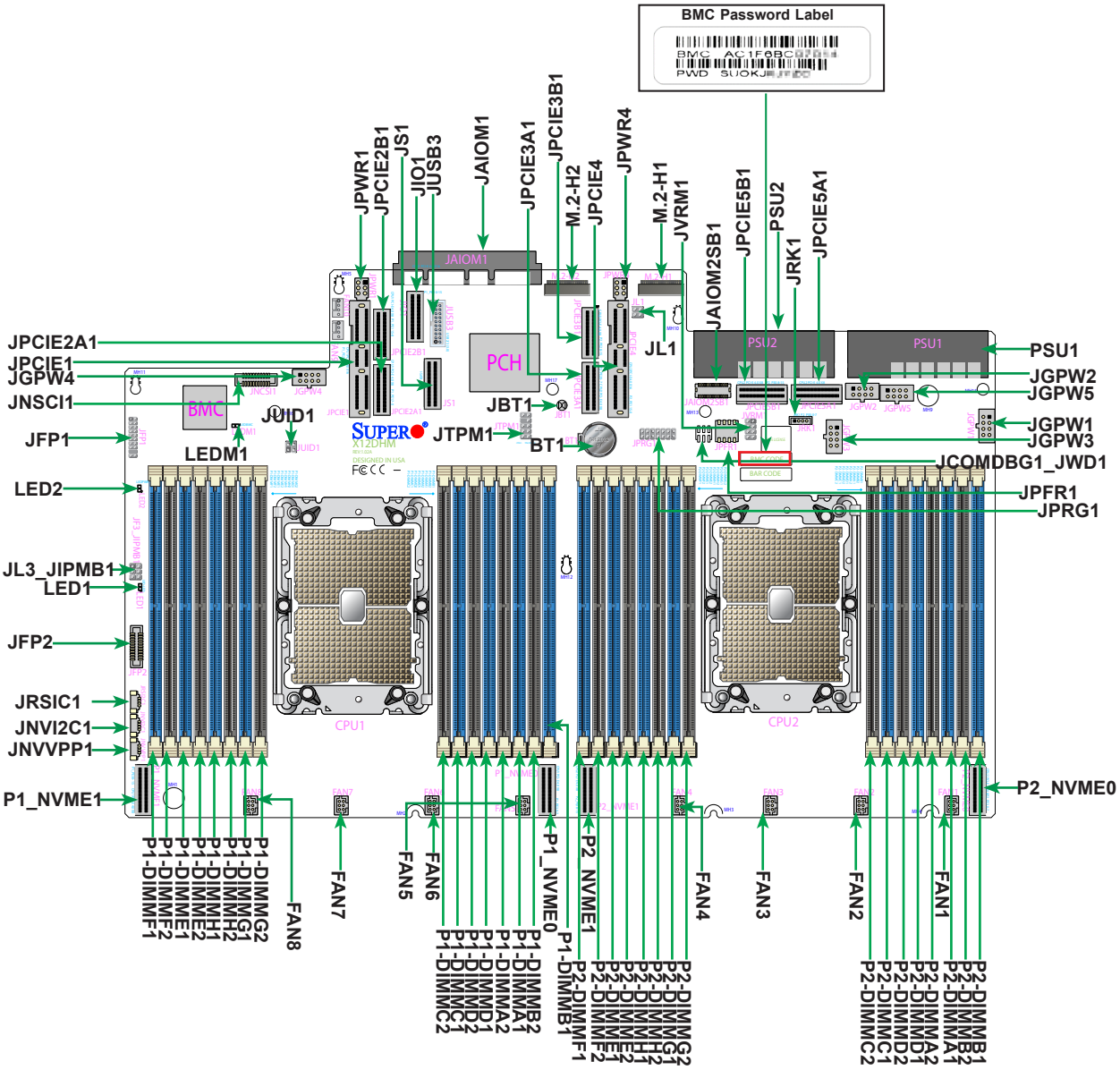


Figure 1-6. Motherboard Layout

Quick Reference Table

Jumper	Description	Default Setting
JBT1	CMOS clear	Open (Normal)

Connector	Description
BT1	Onboard CMOS battery
FAN1 ~ FAN8	6-pin system cooling fan headers
JAIOM1	The Supermicro® Advanced I/O Module (AIOM) slot
JF3_JIPMB1	6-pin BMC external I²C header (for an BMC card)
JFP1	Front control panel header
JFP2	Front VGA header
JGPW1~5	8-pin power connector
JIO1	Low-profile slimSAS 8x I/O connector
JL1	Chassis intrusion header
JNCSI1	NC-SI (Network Controller Sideband Interface) connector
JNVI2C1	NVMe SMBus (I²C) headers used for PCIe hot-plug SMBus clock and data connections
JNVVPP1	CPU VPP bus header for backplane NVMe riser card device
JPCIE1, JPCIE4	CPU PCIe 4.0 x16 slots
JPCIE2A1, JPCIE2B1, JPCIE3A1, JPCIE3B1, JPCIE5A1, JPCIE5B1	CPU PCIe 4.0 x8 slots
JPRG1	Complex Programmable Logical Device (CPLD) header
JPWR1, JPWR4	6-pin power connector
JRSI2C1	SMBus header for riser card
JS1	I-SATA 0~7 connector
JTPM1	Trusted Platform Module/Port 80 Connector
JUID1	Multi-purpose UID switch and reset switch
JUSB3	USB 3.0 header (supports two USB 3.0 ports)
JVRM1	VRM SMB clock to BMC
M.2-H1/M.2-H2	M.2 PCIe 3.0 x2 or SATA 3.0 hybrid slots (Supports M-Key 2280 and 22110) supported by PCH
P1_NVME0/P1_NVME1/P2_NVME0/P2_NVME1	NVMe PCIe 4.0 x4 ports (**Note**: When installing an NVMe device on a motherboard, please be sure to connect JNVME0 first for your system to work properly.)
PSU1~2	Power supply unit connectors
VROC (JRK1)	Intel VROC RAID key header for NVMe SSD

LED	Description	Status
LEDM1	BMC Heartbeat LED	Blinking Green: BMC Normal
LED1	Unit Identifier (UID) LED	Solid Blue: Unit Identified
LED2	System Power LED	LED On: Onboard Power On

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 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 or 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.

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.).

Particulate and Gaseous Contamination Limits

Data centers should meet the following requirements to maintain proper air quality.

Particulate Contamination Specifications

All sources of dust inside data centers should be reduced or eliminated. Dust having a deliquescent relative humidity of less than the maximum allowable relative humidity should be filtered out.

The cleanliness of data centers must adhere to ISO Standard 14644-1 Class 8 (ISO 2015) to be within 95% of the levels specified below:

- Each cubic meter of air should contain no more than 3,520,000 particles that are equal to or greater than 0.5 µm in diameter.
- Each cubic meter of air should contain no more than 832,000 particles that are equal to or greater than 1 µm in diameter.
- Each cubic meter of air should contain no more than 29,300 particles that are equal to or greater than 5 µm in diameter.

This level of cleanliness can generally be achieved by an appropriate filtration scheme, as outlined below:

- The room air should be continuously filtered with MERV 8 filters, as recommended by AHRI Standard 1360 (2017).

- The air entering the data center should be filtered with MERV 11 to MERV 13 filters.

Gaseous Contamination Specifications

The total gaseous contamination, i.e., copper and silver corrosion rates, should not exceed ANSI/ISA Standard 71.04-2013, severity level G1 (mild) as described below:

- A copper reactivity rate of less than 300 Å/month.
- A silver reactivity rate of less than 200 Å/month.



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:

- Load the rack from the bottom to the top with the heaviest component at the bottom of the rack. If this unit is the only unit in the rack, it should be mounted 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 workspace.
- Do not pick up the server with the front handles. They are designed to pull the system from a rack only.

2.4 Installing the Rails

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 26.8" and 36.4" deep.

Identifying the Rails

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

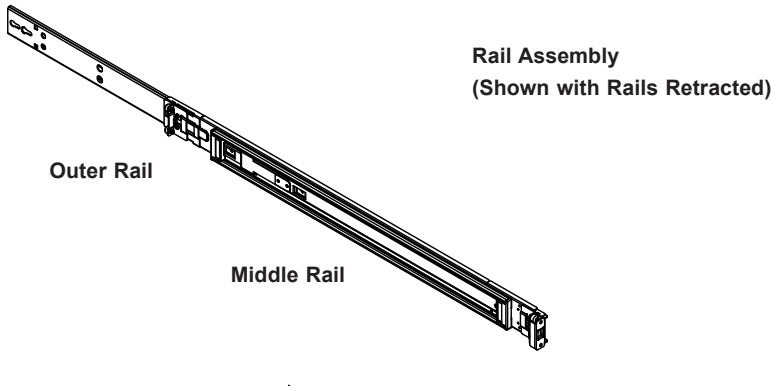


Figure 2-1. Identifying the Outer Rail, Middle Rail and Inner Rail
(Left Rail Assembly Shown)

Note: Both front chassis rails and the rack rails have a locking tab, which serves two functions. First, it locks the chassis into place when installed and pushed fully into the rack (its normal operating position. In addition, these tabs lock the chassis in place when fully extended from the rack. This prevents the chassis from coming completely out of the rack when pulled out for servicing.

Releasing the Inner Rail

Each inner rail has a locking latch. This latch prevents the chassis from coming completely out of the rack 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.

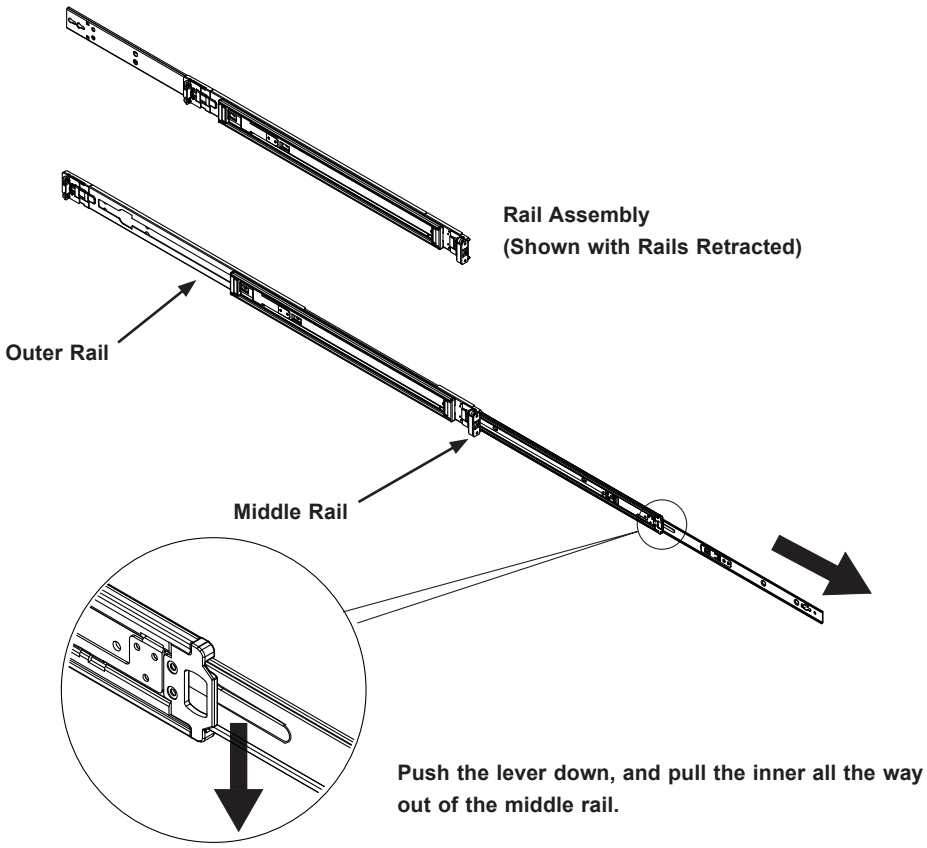


Figure 2-2. Extending and Releasing the Inner Rail

Installing the Inner Rails

Begin the rack mounting procedure by installing the inner rails to the chassis.

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 and under the hooks 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 a screw.

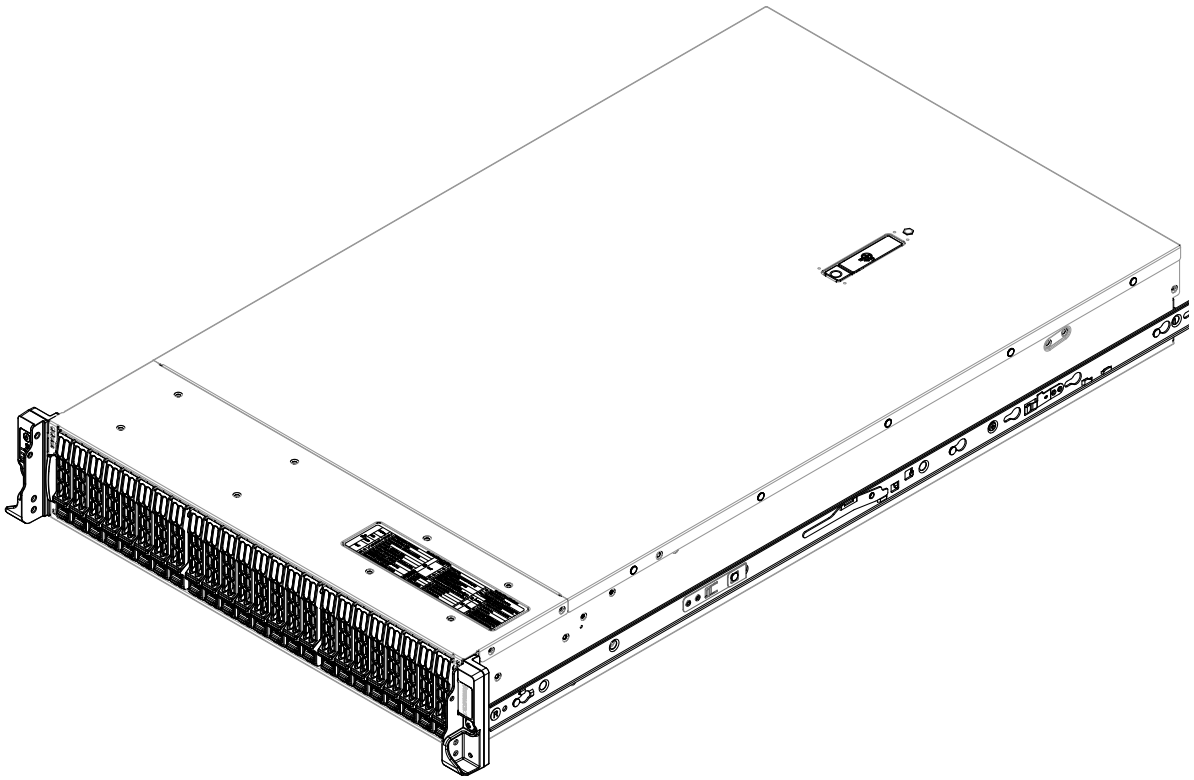


Figure 2-3. Installing the Rails

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

Installing the Outer Rails onto the Rack

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.

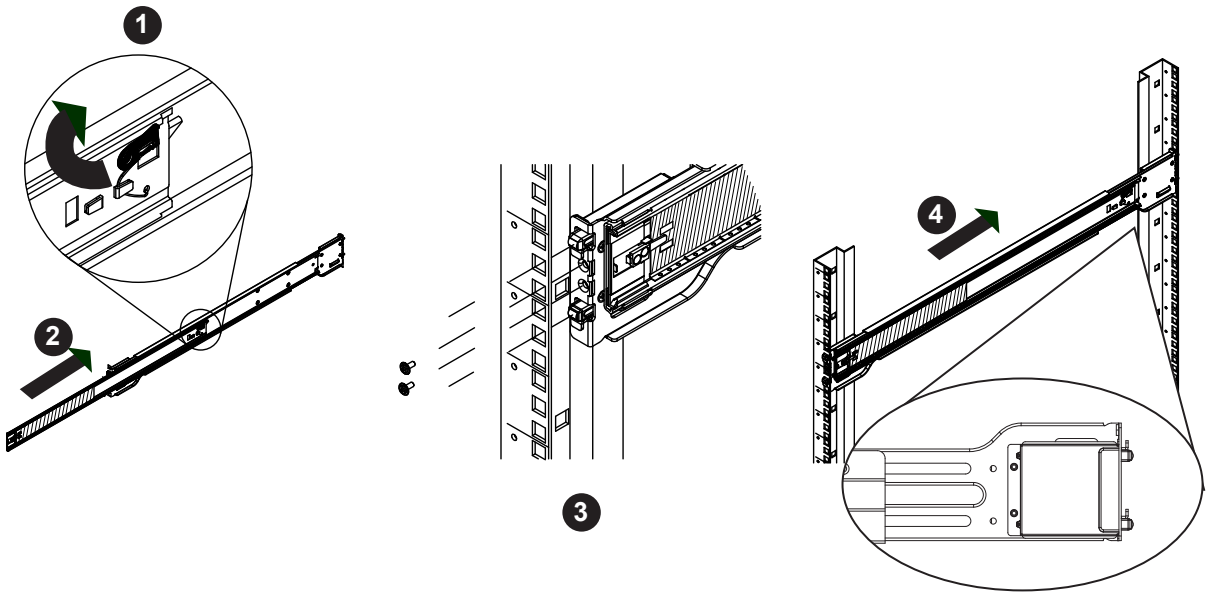


Figure 2-4. Extending and Mounting the Outer Rails

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.

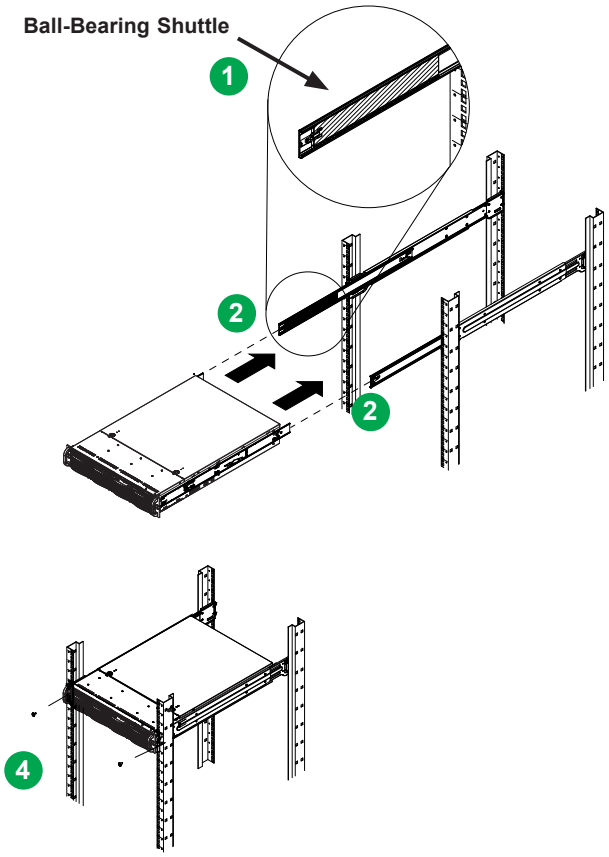


Figure 2-5. Installing the Server into the Rack

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

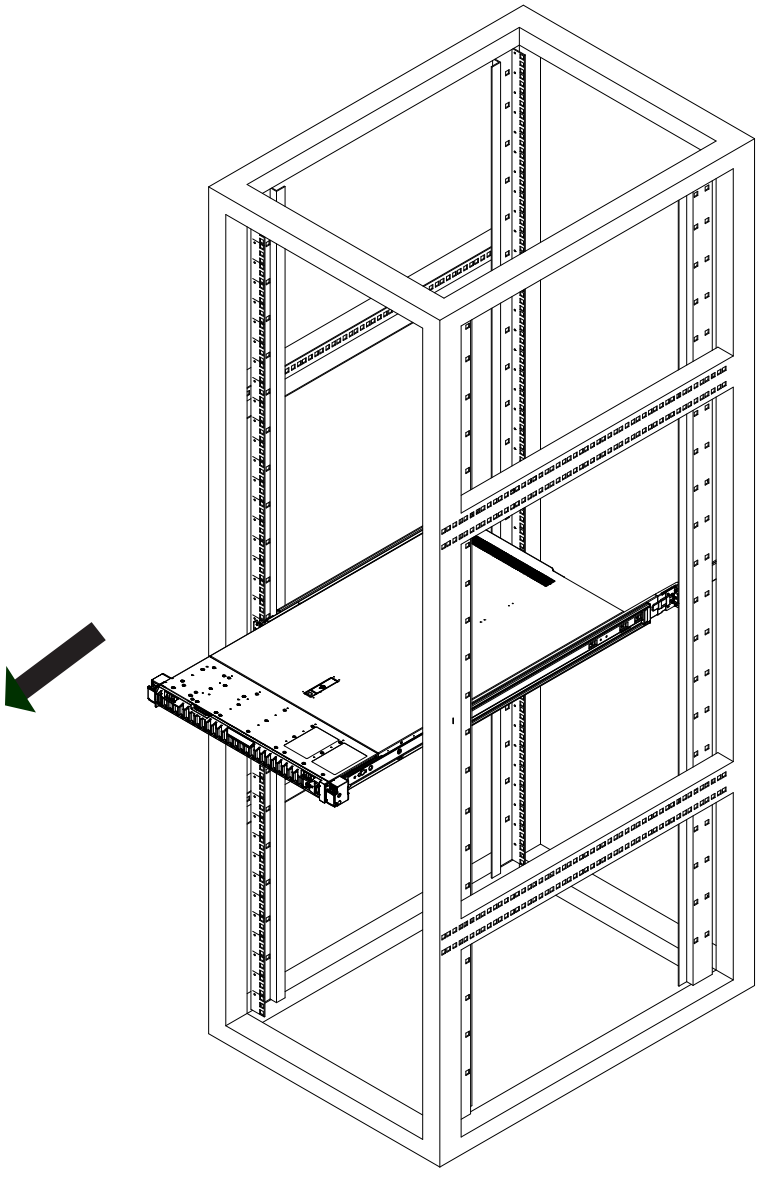


Figure 2-6. Removing the Chassis From the Rack

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 requires that power first be removed from the system. Please follow the procedures given in each section.

3.1 Removing Power

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

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

3.2 Accessing the System

The CSE-HS219-R1K63P chassis features a removable top cover, which allows easy access to the inside of the chassis.

Removing the Top Cover

1. Press the release button and slide the cover toward the rear.
2. 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.

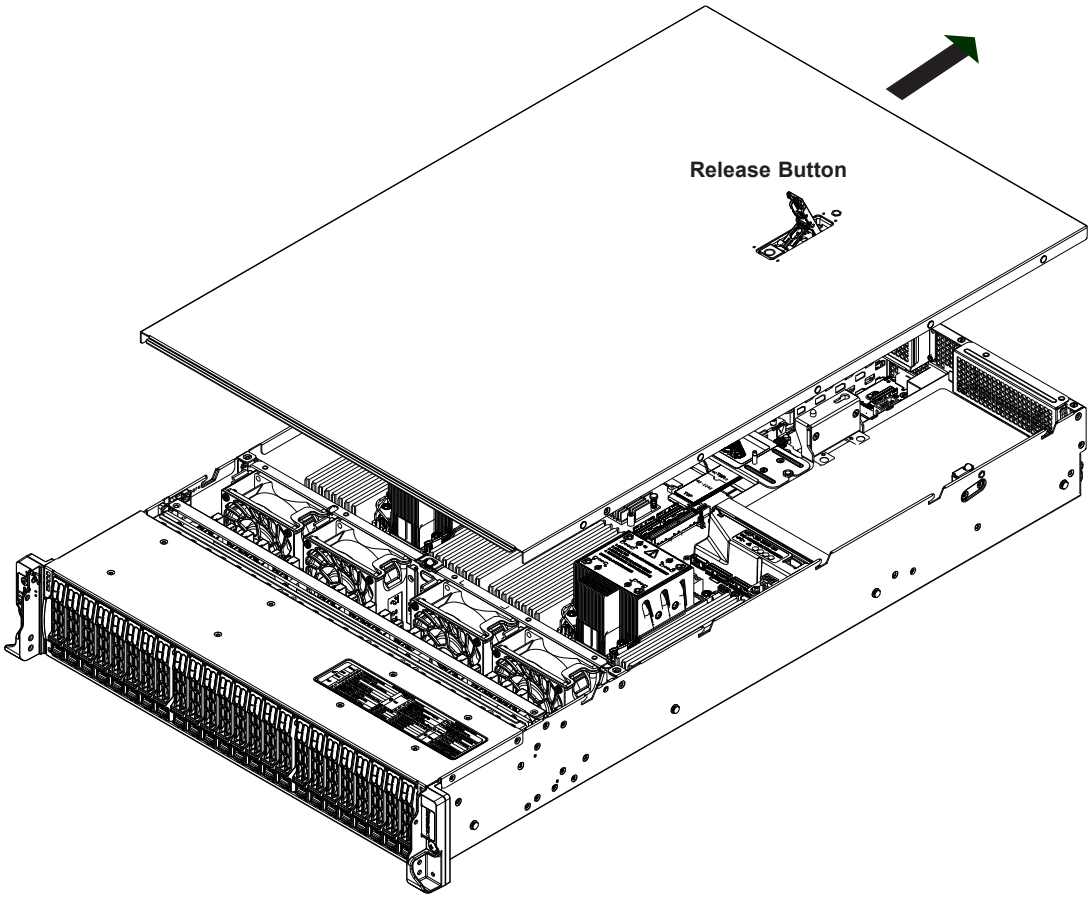


Figure 3-1. Removing the Chassis Cover

3.3 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To avoid damaging your motherboard, it is important to handle it very carefully. The following measures are generally sufficient to protect the system PCBs from ESD.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any PCB (printed circuit board) from its antistatic bag.
- Handle PCBs by their edges only; do not touch its components, peripheral chips, memory modules, or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the PCBs back into their antistatic bags when not in use.
- Use only the correct type of onboard CMOS battery. Do not install the onboard battery upside down to avoid a possible explosion.

3.4 Processor and Heatsink Installation

The processor (CPU) must first be attached to the processor carrier to form the processor carrier assembly. This assembly gets attached to the heatsink to form the processor heatsink module (PHM), which is then installed into the CPU socket. Before installing, be sure to perform the steps below:

- Please carefully follow the instructions given on ESD precautions.
- After shutting down the system, unplug the AC power cords 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 LGA lands (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 (https://www.supermicro.com/en) for updates on processor and memory support.
- All graphics in this manual are for illustration only. Your components may look different.

The Processor Carrier Assembly

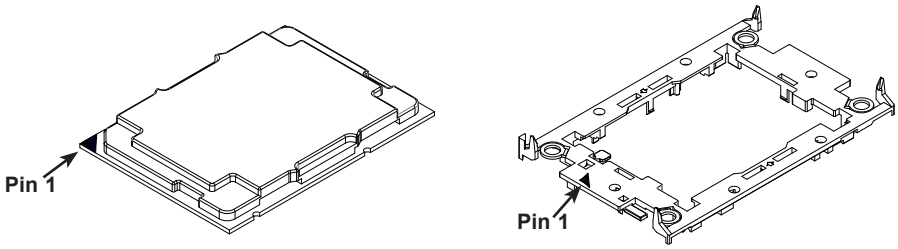
The processor carrier assembly is comprised of the processor and the processor carrier.

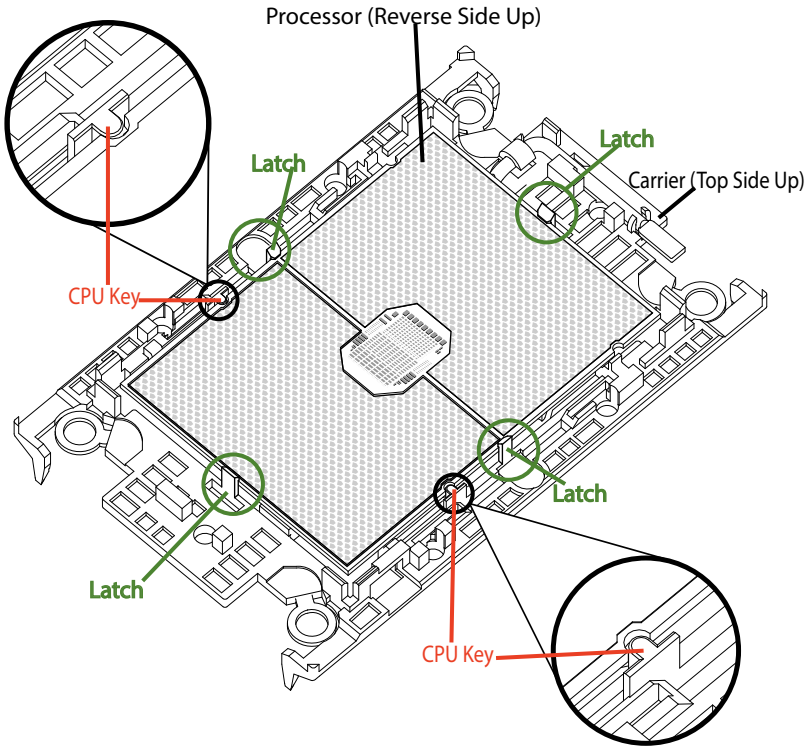
To create the processor carrier assembly, please follow the steps below:

Note: Before installation, be sure to review the Static-Sensitive Devices section earlier in this chapter.

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.

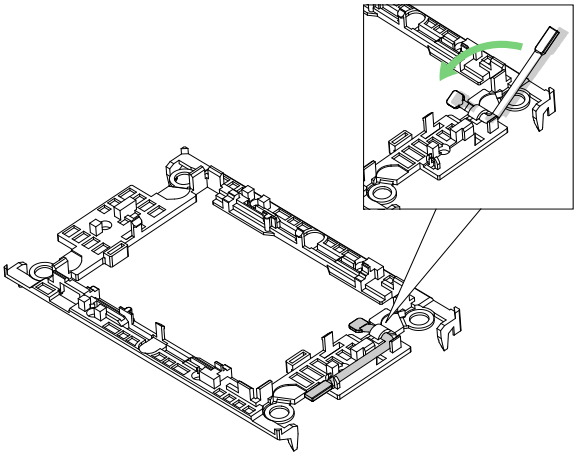
2. Turn the processor over (with the gold pins up). Locate the CPU keys on the processor and the four latches on the carrier as shown below.



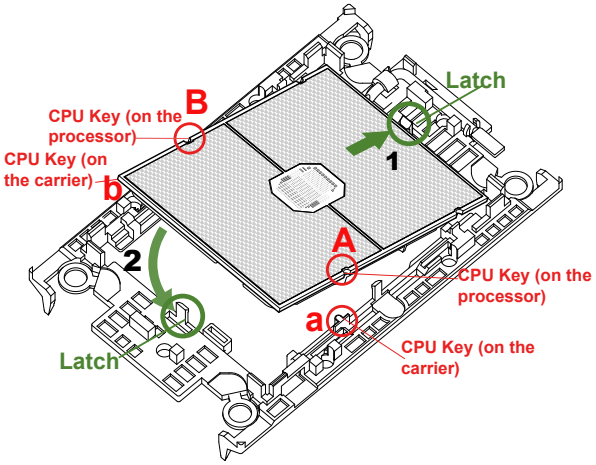


(with Processor Seated inside the Carrier)

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

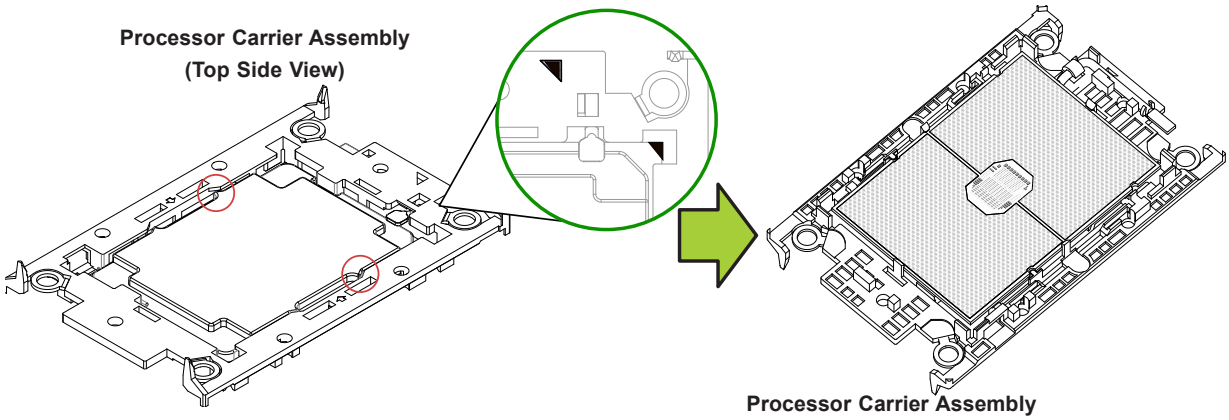


4. Using pin 1 as a guide, carefully align the CPU keys on the processor (A & B) with those on the carrier (a & b) as shown below.



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.

6. After the processor is placed inside the carrier, examine the four sides of the processor, making sure that the processor is properly seated on the carrier.

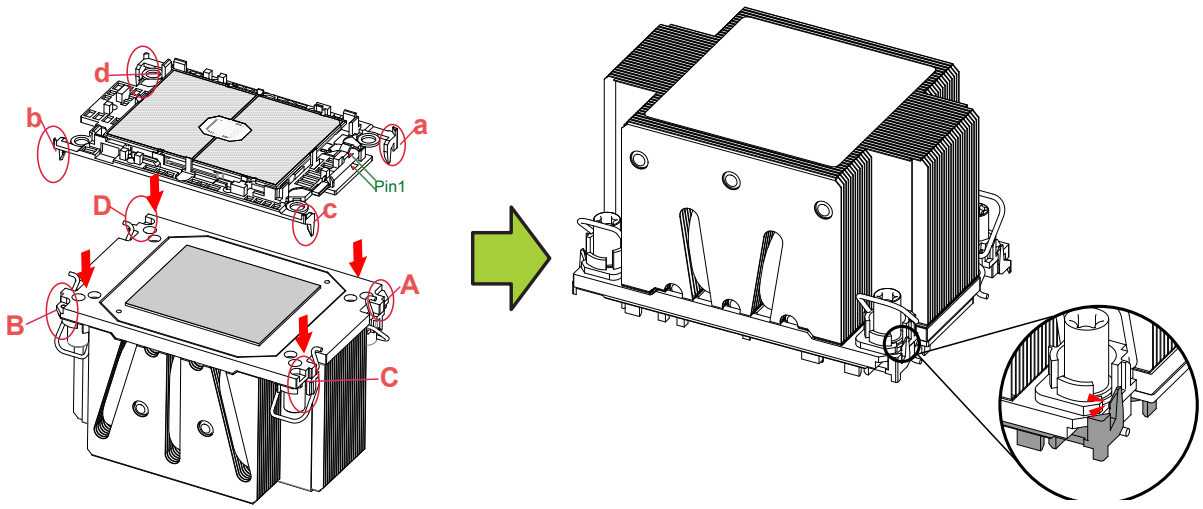


The Processor Heatsink Module (PHM)

After creating the processor carrier assembly, follow the instructions below to 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.

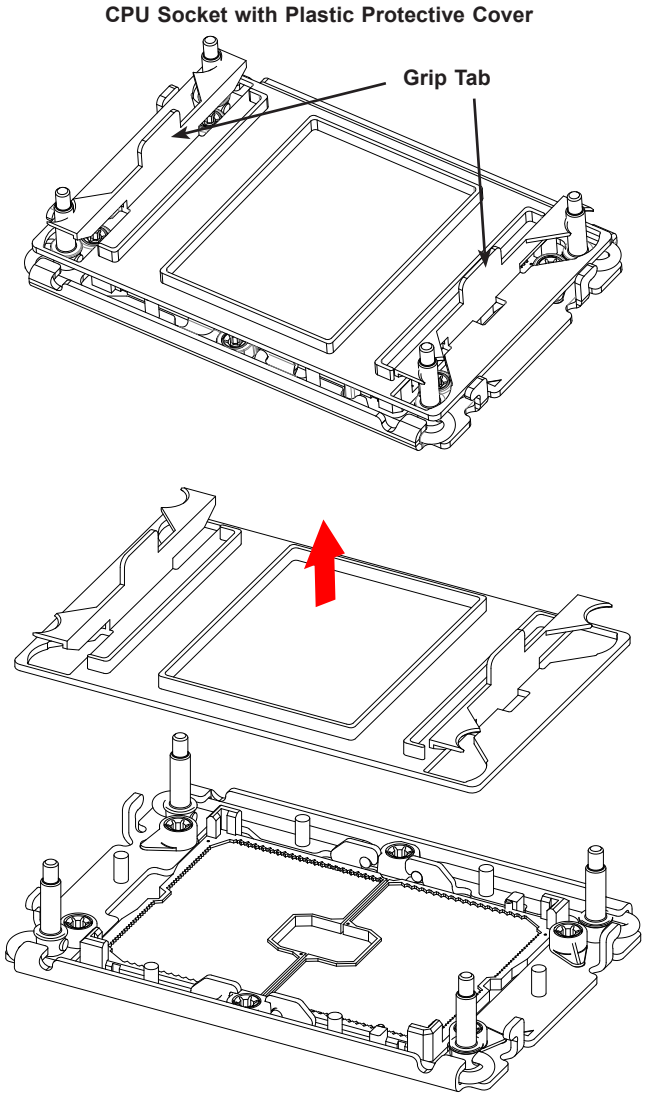
1. Turn the heatsink over with the thermal grease facing up. Pay attention to the two triangle cutouts (A, B) located at the diagonal corners of the heatsink as shown in the drawing below.
2. Hold the processor carrier assembly upside-down to locate the triangles on the processor and the carrier, which 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.



Preparing the CPU Socket for Installation

The CPU socket comes with a plastic protective cover, which needs to be removed before installing the Processor Heatsink Module (PHM). Do this by gently squeezing the grip tabs then pulling the cover off.

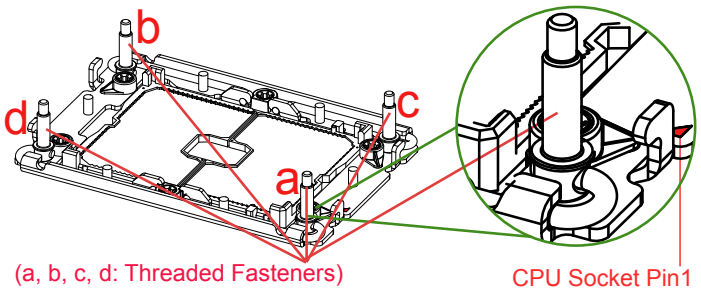
CPU Socket with Plastic Protective Cover



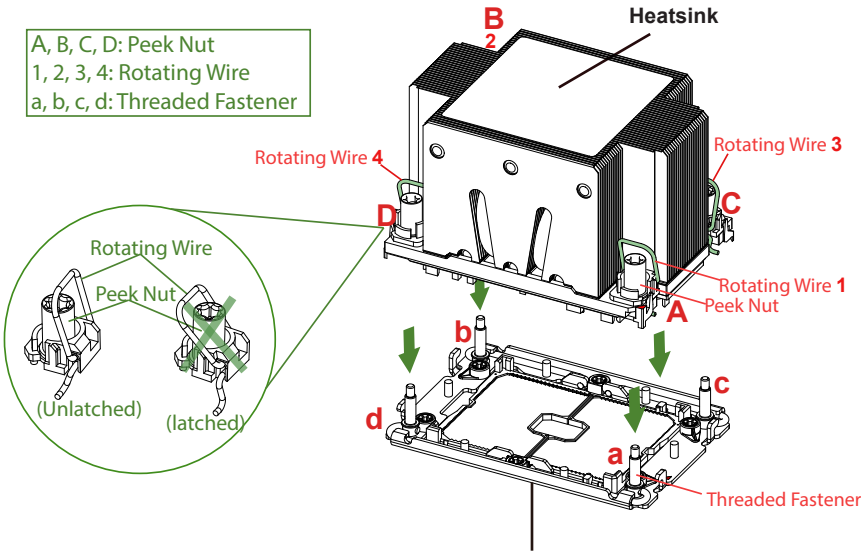
Installing the PHM into the CPU Socket

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.

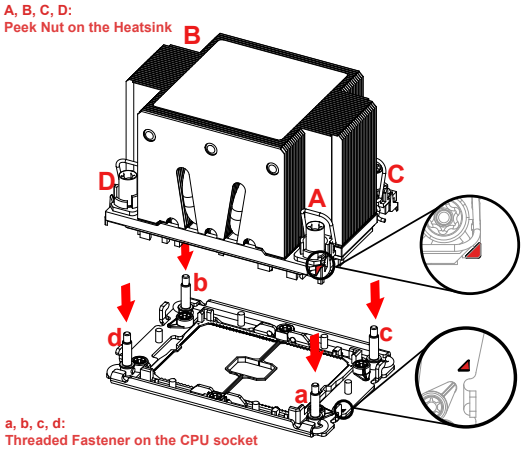


3. Check the rotating wires (1, 2, 3, 4) to make sure that they are in the unlatched position as shown.

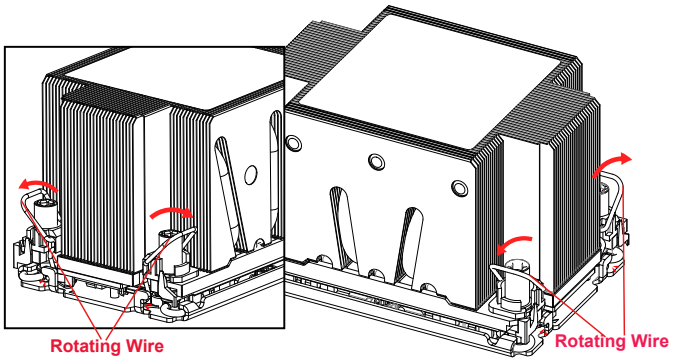


4. Align peek nut "A" (next to the triangular pin 1 on the heatsink) with threaded fastener "a" on the CPU socket. Then align peek nuts "B", "C", "D" on the heatsink with threaded fasteners "b", "c", "d" on the CPU socket, making sure that all peek nuts and threaded fasteners are properly aligned.

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.

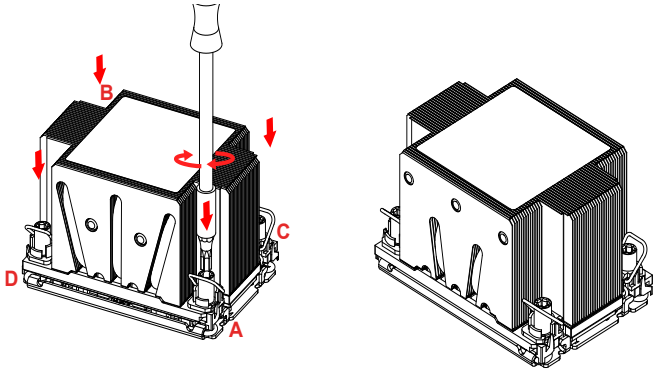


6. Press all four rotating wires outward and make sure that the heatsink is securely latched into the CPU socket.



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.

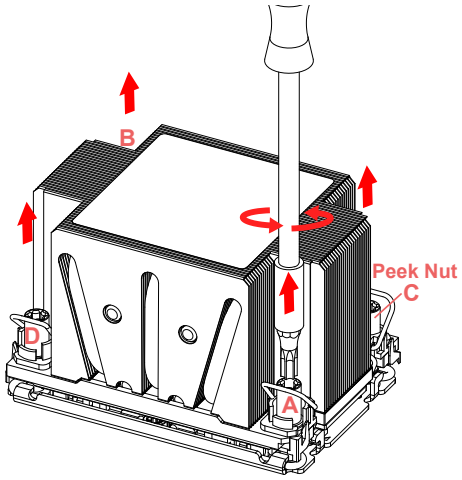
8. Examine all corners of the heatsink to ensure that the PHM is firmly attached to the CPU socket.



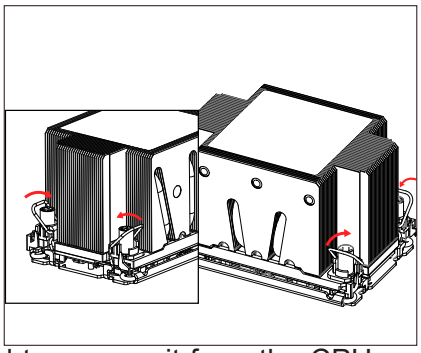
Removing the PHM from the CPU Socket

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

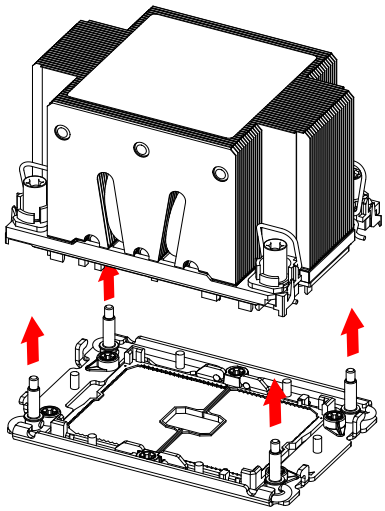
1. Use a T30-bit screwdriver to loosen the four peek nuts on the heatsink in the sequence of A, B, C, and D.



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.



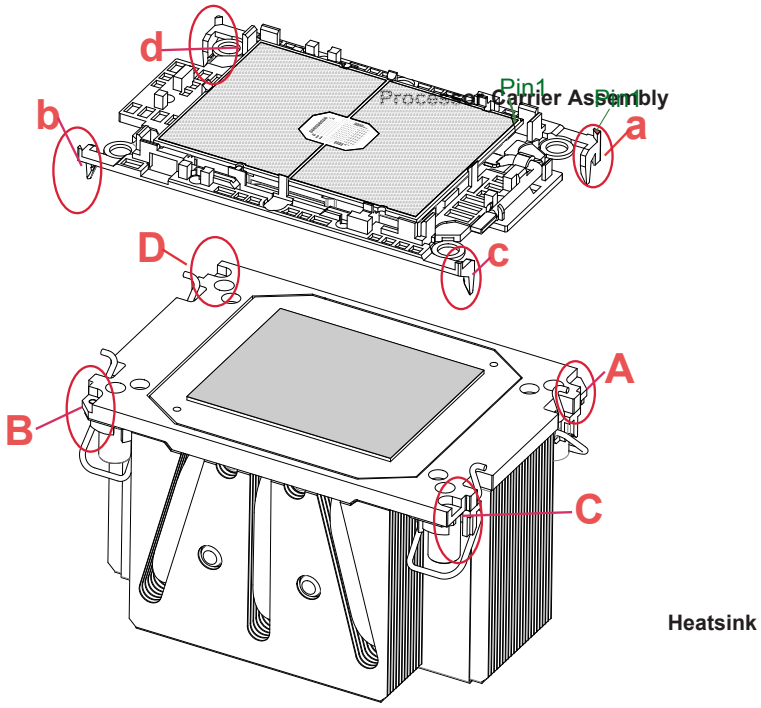
3. Gently lift the PHM upward to remove it from the CPU socket.



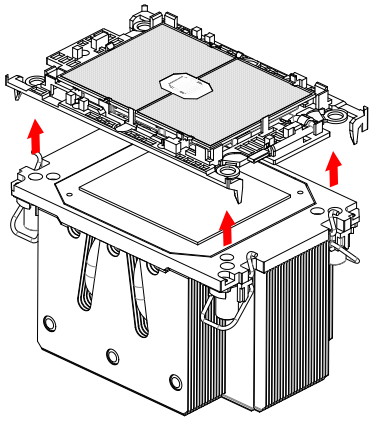
Removing the Processor Carrier Assembly from the PHM

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.



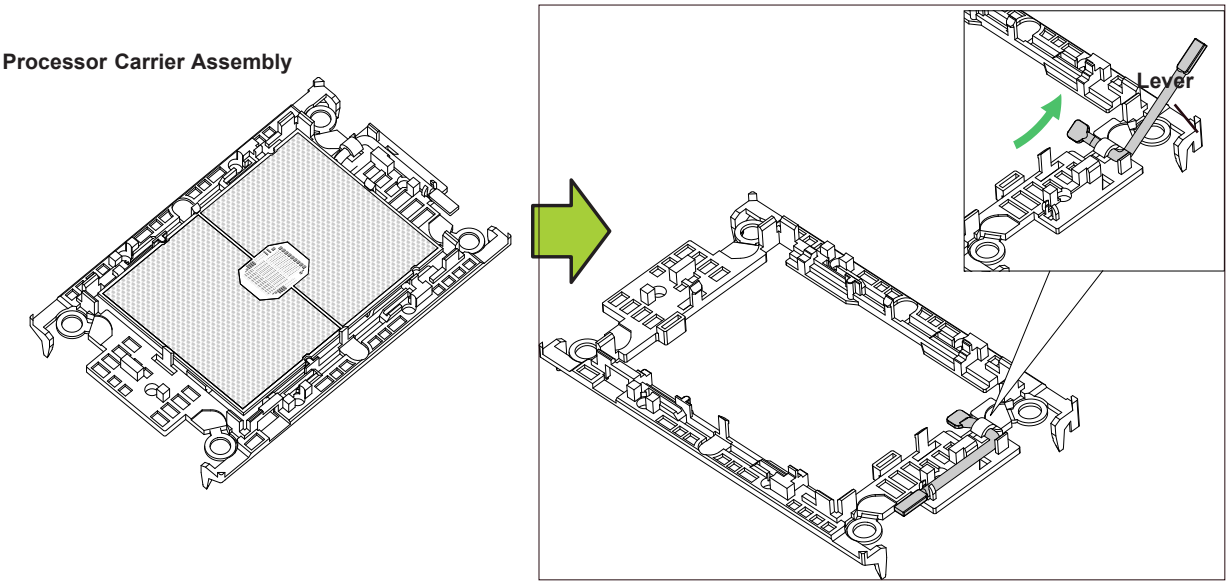
2. When all plastic clips have been detached from the heatsink, remove the processor carrier assembly from the heatsink.



Removing the Processor from the Processor Carrier Assembly

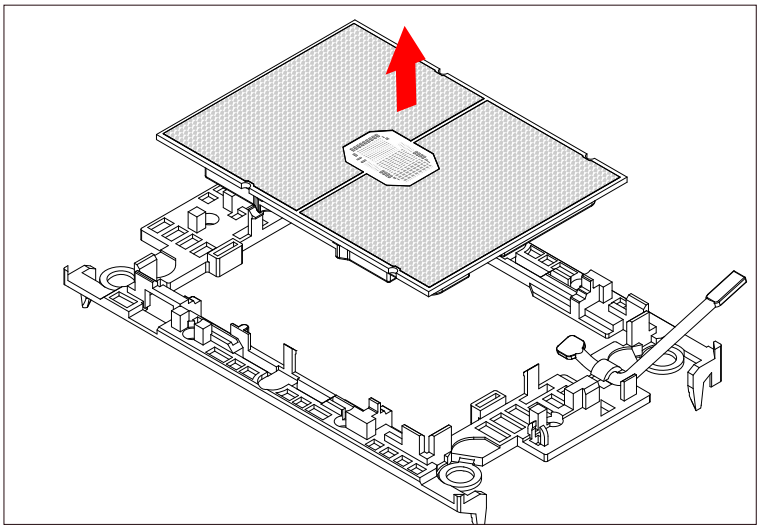
Once you have removed the processor carrier assembly from the PHM, you are ready to remove the processor from the processor carrier by following the steps below.

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.



3.5 Memory Support and Installation

Note: Check the Supermicro website for recommended memory modules.

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

Memory Support

The X12DHM-6 supports up to 8TB 3DS LRDIMM/LRDIMM/3DS RDIMM/RDIMM DDR4 (288-pin) ECC memory with speeds of 3200/2933/2666 MHz in 32 memory slots and up to 8TB Intel Optane PMem 200 Series with speeds up to 3200 MHz. (See the notes below.)

Note 1: Intel® Optane™ Persistent Memory (PMem) 200 Series is supported by the 3rd Gen Intel Xeon Scalable (83xx/63xx/53xx/4314 Series) Processors.

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

DDR4 Memory Support for the 3rd Gen Intel Xeon Scalable Processors

DDR4 Memory Support for the 3rd Gen Intel Xeon Scalable Processors					
Type	Ranks Per DIMM & Data Width	DIMM Capacity (GB)		Speed (MT/s); Voltage (V); Slots Per Channel (SPC) and DIMMs Per Channel (DPC)	
				1DPC (1-DIMM Per Channel)	2DPC (2-DIMM Per Channel)
		8Gb	16Gb	1.2 V	1.2 V
RDIMM	SRx8	8GB	16GB	3200	3200
	SRx4	16GB	32GB		
	DRx8	16GB	32GB		
	DRx4	32GB	64GB		
RDIMM 3Ds	(4R/8R) X4	2H- 64 GB 4H-128 GB	2H- 128 GB 4H-256 GB		
LRDIMM	QRx4	64GB	128GB	3200	3200
LRDIMM - 3Ds	(4R/8R) X4	4H-128 GB	2H- 128 GB 4H-256 GB	3200	3200

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

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	**Memory Population Sequence**
1 CPU & 1 DIMM	A1
1 CPU & 2 DIMMs*	A1, E1
1 CPU & 4 DIMMs*	A1, E1, C1, G1
1 CPU & 6 DIMM	A1, E1, C1, G1, B1, F1
1 CPU & 8 DIMMs*	A1, E1, C1, G1, B1, F1, D1, H1
1 CPU & 12 DIMMs	A1, E1, C1, G1, B1, F1, A2, E2, C2, G2, B2, F2
1 CPU & 16 DIMMs*	A1, E1, C1, G2, B1, F1, D1, H1, A2, E2, C2, G2, B2, F2, D2, H2
2 CPUs & 2 DIMMs*	CPU1: A1 CPU2: A1
2 CPUs & 4 DIMMs*	CPU1: A1, E1 CPU2: A1, E1
2 CPUs & 6 DIMMs	CPU1: A1, E1, C1, G1 CPU2: A1, E1
2 CPUs & 8 DIMMs*	CPU1: A1, E1, C1, G1 CPU2: A1, E1, C1, G1
2 CPUs & 10 DIMMs	CPU1: A1, E1, C1, G1, B1, F1 CPU2: A1, E1, C1, G1
2 CPUs & 12 DIMMs*	CPU1: A1, E1, C1, G1, B1, F1 CPU2: A1, E1, C1, G1, B1, F1
2 CPUs & 14 DIMMs	CPU1: A1, E1, C1, G1, B1, F1, D1, H1 CPU2: A1, E1, C1, G1, B1, F1
2 CPUs & 16 DIMMs*	CPU1: A1, E1, C1, G1, B1, F1, D1, H1 CPU2: A1, E1, C1, G1, B1, F1, D1, H1
2 CPUs & 18 DIMMs	CPU1: A1, E1, C1, G1, B1, F1, A2, E2, C2, G2, B2, F2 CPU2: A1, E1, C1, G1, B1, F1
2 CPUs & 20 DIMMs	CPU1: A1, E1, C1, G1, B1, F1, A2, E2, C2, G2, B2, F2 CPU2: A1, E1, C1, G1, B1, F1, D1, H1
2 CPUs & 22 DIMMs	CPU1: A1, E1, C1, G1, B1, F1, D1, H1, A2, E2, C2, G2, B2, F2, D2, H2 CPU2: A1, E1, C1, G1, B1, F1
2 CPUs & 24 DIMMs*	CPU1: A1, E1, C1, G1, B1, F1, D1, H1, A2, E2, C2, G2, B2, F2, D2, H2 CPU2: A1, E1, C1, G1, B1, F1, D1, H1
2 CPUs & 28 DIMMs*	CPU1: A1, E1, C1, G1, B1, F1, D1, H1, A2, E2, C2, G2, B2, F2, D2, H2 CPU2: A1, E1, C1, G1, B1, F1, D1, H1, A2, E2, C2, G2
2 CPUs & 32 DIMMs*	CPU1: A1, E1, C1, G1, B1, F1, D1, H1, A2, E2, C2, G2, B2, F2, D2, H2 CPU2: A1, E1, C1, G2, B1, F1, D1, H1, A2, E2, C2, G2, B1, F2, D1, H2

*** recommended for optimal performance**

- 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 interl-leve	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	DDR4	-	PM	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 with PMem 200 Series)

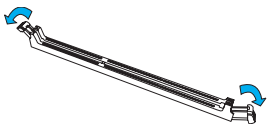
DIMM Type	Ranks Per DIMM & Data Width (Stack)	DIMM Capacity (GB)	
		DRAM Density	
		8Gb	16Gb
RDIMM (up to 3200)	1Rx8	N/A	N/A
	1Rx4	16GB	32GB
	1Rx8	16GB	32GB
	1Rx4	32GB	64GB
RDIMM 3DS (up to 3200)	4Rx4 (2H)	N/A	128GB
	8Rx4 (4H)	NA	256GB
LRDIMM (up to 3200)	4Rx4	64GB	128GB
LRDIMM 3DS (up to 3200)	4Rx4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

PMem Notes

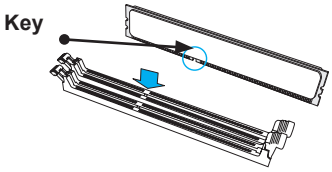
- PMem 200 Series are supported on 3rd gen Intel Xeon Scalable Platinum, Gold and selected Silver processors.
- Do not mix PMem and NVDIMMs within the platform.
- For MM, NM/FM ratio is between 1:4 and 1:16. The capacity not used for FM can be used for AD. (NM = Near Memory; FM = Far Memory).
- Matrix 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.

DIMM Installation

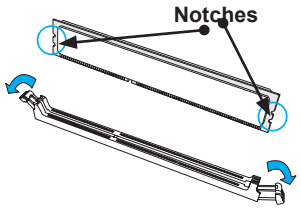
1. Insert the desired number of DIMMs into the slots based on the recommended DIMM population tables shown above.
2. Push the release tabs on both ends of the DIMM slot outwards to unlock it.



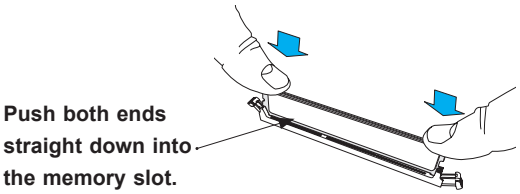
3. Align the key of the DIMM module with the receptive point on the memory slot.



4. Align the notches on both ends of the module with the receptive points on the ends of the slot.



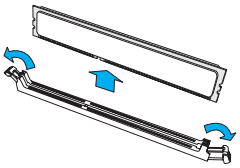
5. Push both ends of the module straight down into the slot until the module snaps into place.



6. Press the release tabs to the lock positions to secure the DIMM module into the slot.

DIMM Removal

Press both release tabs on the ends of the DIMM module to unlock it. Once the DIMM module is loose, remove it from the memory slot.



Warning! To avoid causing any damage to the DIMM module or the DIMM socket, do not use excessive force when pressing the release tabs on the ends of the DIMM socket. Handle DIMMs with care. Be aware and follow the ESD instructions given at the beginning of this chapter.

3.6 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.

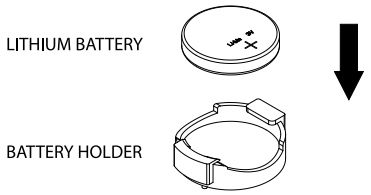


Figure 3-2. Installing the Onboard Battery

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).

3.7 Storage Drives

The storage drives are mounted in tool-less drive carriers that simplify their removal from the chassis. These carriers also help promote proper airflow. For compatible storage drives, see the SYS-220H-TN24R product page.

Installing Drives



Figure 3-3. 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.

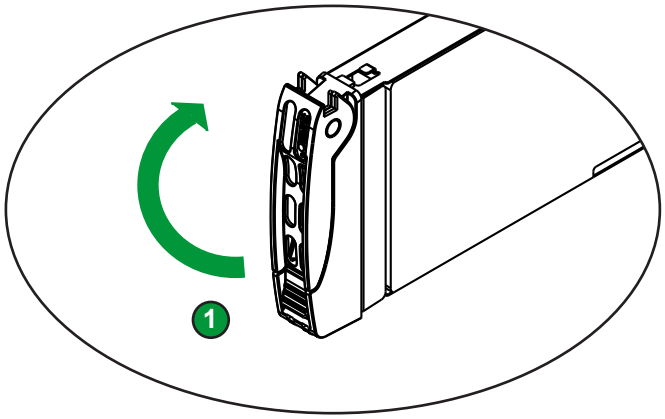


Figure 3-4. Removing a Drive Carrier

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 VROC appendix in this manual instead.

Ejecting a Drive

1. **BMC > 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.

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

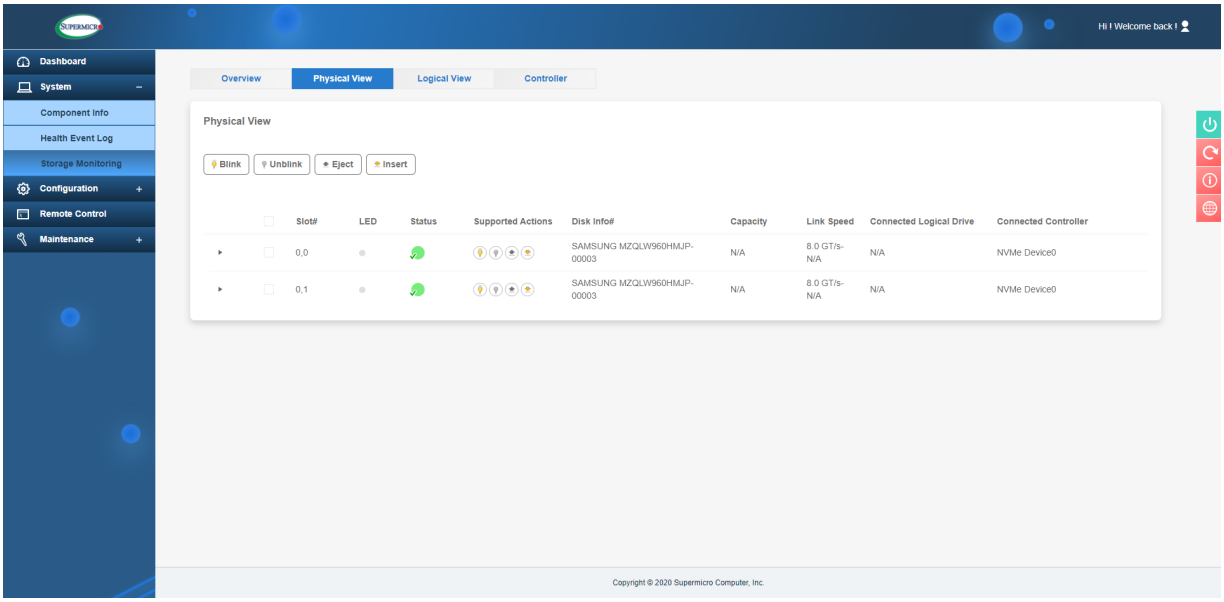


Figure 3-5. BMC Screenshot

Replacing the Drive

1. Insert the replacement drive.
2. **BMC > System > Storage Monitor > 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.

Installing M.2 Solid State Drives

The X12DHM-6 motherboard has two hybrid PCIe 3.0 and NVMe or SATA M.2 slots (M.2-H1, M.2-H2). M.2 allows for a variety of card sizes, increased functionality, and spatial efficiency. The M.2 slot on the motherboard supports PCIe 3.0 x2 or SATA 3.0 devices in the 2280 and 22110 form factors.

Installing M.2 Drives

1. Remove power from the system and then remove the top cover as described in Sections 3.1 and 3.2.
2. Refer to its layout image in the Motherboard manual and locate the M.2 slot. Insert the plastic clip into the hole against the M.2 slot on the motherboard.
3. Turn the plastic clip by 90° degrees.
4. Insert the M.2 sideways into the connector so that it lays flat, then secure it to the motherboard with the plastic clip.
5. Repeat as necessary for more M.2 drives.
6. Finish by replacing the cover and restoring power to the system.

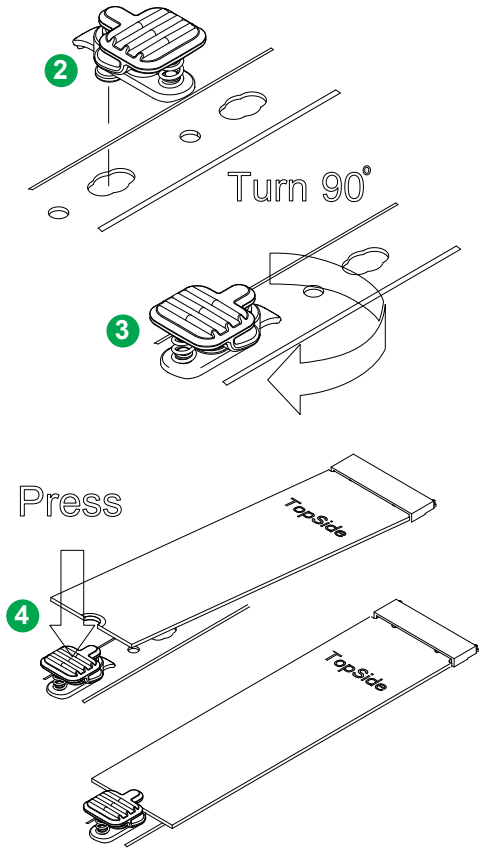


Figure 3-6. Installing an M.2 SSD

3.8 System Cooling

Fans

Four 8-cm heavy-duty fans provide cooling for the system. Fans are hot-swapped and can be replaced without powering down the system. The electrical connections are automatically made when a fan is inserted into its slot.

Make sure the chassis cover is only off for a short time and makes a good seal when replaced for the cooling air to circulate properly through the system.

Changing a System Fan

1. Determine which fan is failing using BMC if possible. If not, remove the chassis cover while the power is on and examine the fans to determine which one has failed.
2. Squeeze the fan tabs of the failed fan and lift the fan housing up and out of the chassis.
3. To install a fan, push it into the proper location until it clicks.
4. Finish by fully closing the cover and pushing the system back into the rack.

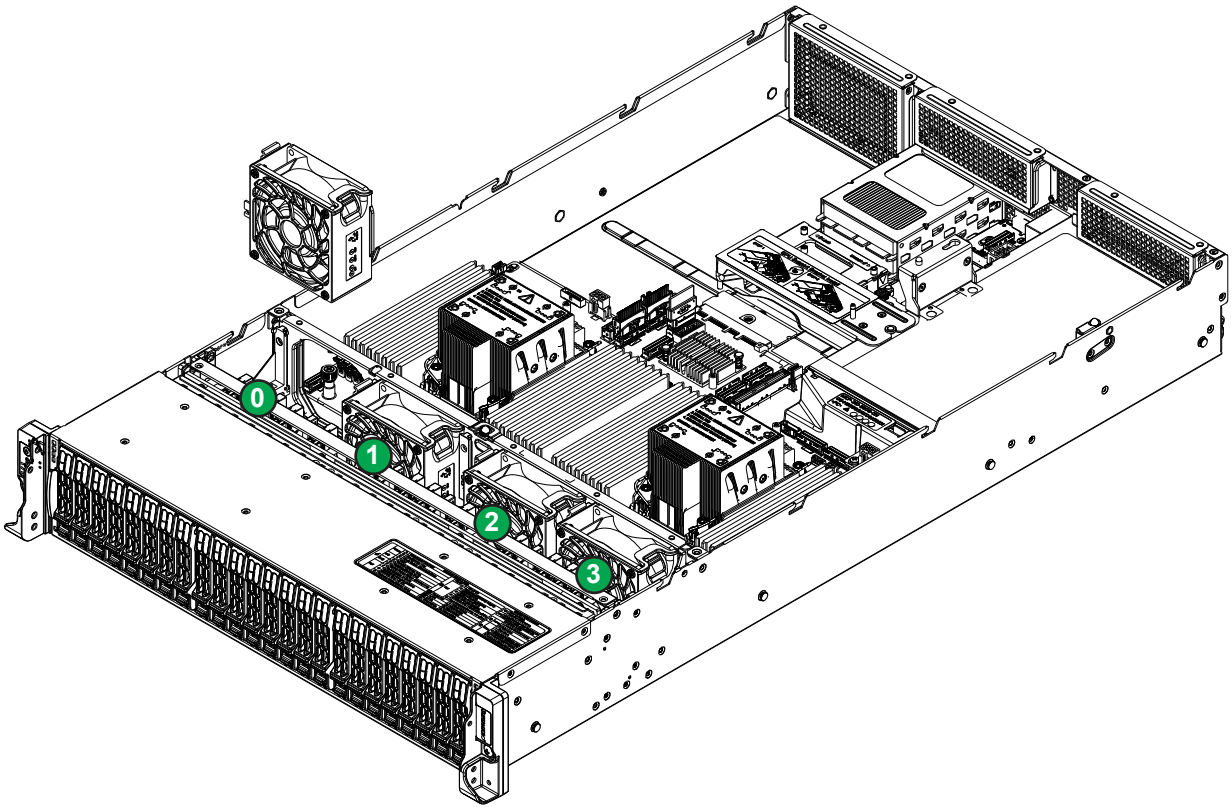


Figure 3-7. Installing a Fan (positions indicated)

Air Shrouds

Air shrouds concentrate airflow to maximize fan efficiency. The SYS-220H-TN24R includes one air shroud for each CPU.

Air Shroud for Memory (CPU1/2)

Two air shrouds cool the DIMM slots controlled by CPUs 1 and 2 (see figure below).

1. Remove the system from the rack and remove the cover as described previously.
2. Place each air shroud over sixteen DIMM slots at a time for both CPU1 and CPU2-controlled DIMM slots, as illustrated below.
3. Close the cover and push the system back into the rack.

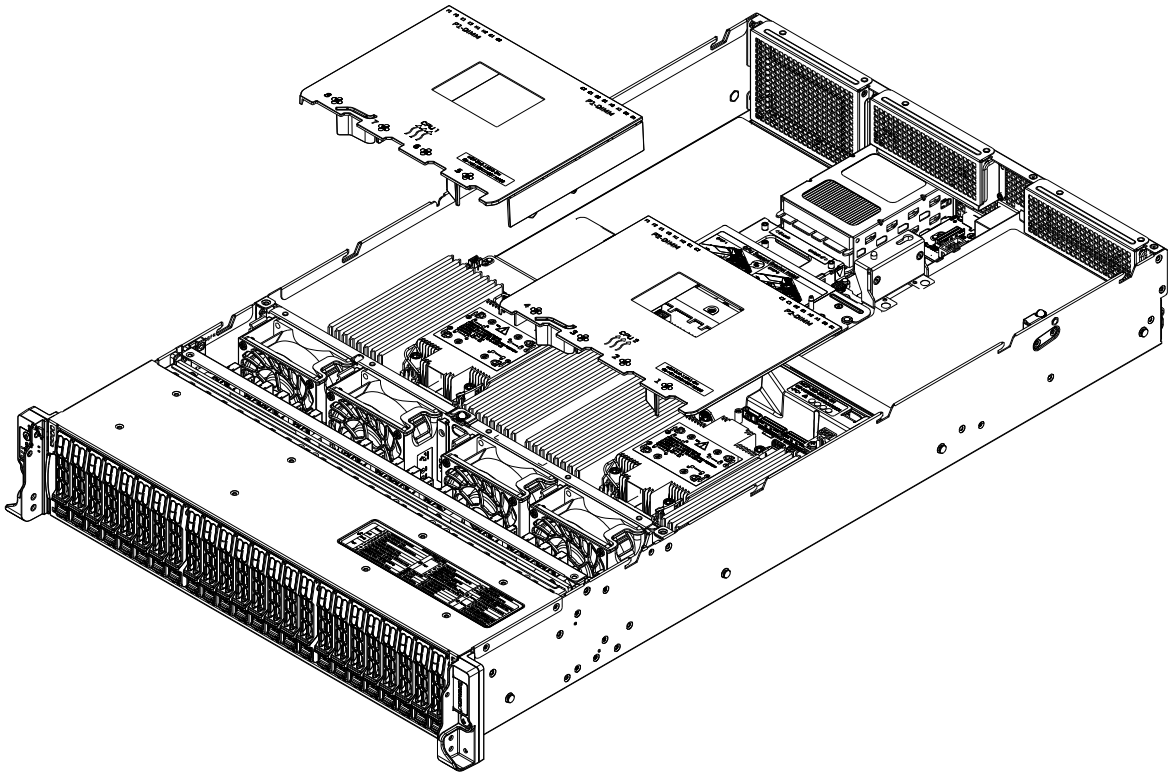


Figure 3-8. Installing Air Shrouds for CPU1/2 DIMMs

3.9 Expansion Cards

The SYS-220H-TN24R series can support up to eight expansion cards.

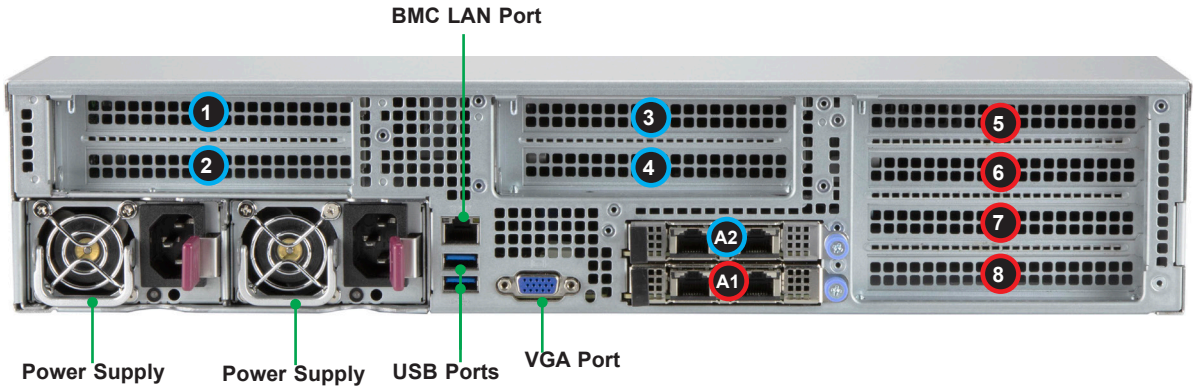


Figure 3-9. Expansion Card Slots

Expansion Card Slot Configurations

Enabling any of the eight expansion card slots in this system requires optional parts that are sold separately. See below for expansion card slot configuration ordering information.

Each expansion card slot is assigned to specific motherboard PCIe x8 MCIO connectors or PCIe x16 slots. The following table shows the possible expansion card slot configuration options and the corresponding motherboard PCIe connector assignment.

Expansion Card Slot Configurations		
Slot Configurations	**Slot Width**	**Motherboard Connection**
Up to eight PCIe x8 slots	Slot 1: PCIe x8	Cable connection from JPCIE5A1 (CPU2)
	Slot 2: PCIe x8	Cable connection from JPCIE5B1 (CPU2)
	Slot 3: PCIe x8	Cable connection from JPCIE4 (CPU2)
	Slot 4: PCIe x8	Cable connection from JPCIE4 (CPU2)
	Slot 5: PCIe x8	Cable connection from JPCIE2A1 (CPU1)
	Slot 6: PCIe x8	Cable connection from JPCIE2B1 (CPU1)
	Slot 7: PCIe x8	Edge connection from JPCIE1 (CPU1)
	Slot 8: PCIe x8	Edge connection from JPCIE1 (CPU1)
Up to four PCIe x16 slots	Slot 1: PCIe x16	Cable connection from JPCIE5A1 + JPCIE5B1 (CPU2)
	Slot 2: No connection	No connection
	Slot 3: PCIe x16	Cable connection from JPCIE4 (CPU2)
	Slot 4: No connection	No connection
	Slot 5: PCIe x16	Cable connection from JPCIE2A1 + JPCIE2B1 (CPU1)
	Slot 6: No connection	No connection
	Slot 7: PCIe x16	Edge connection from JPCIE1 (CPU1)
	Slot 8: No connection	No connection

CPU1
CPU2

Before following the procedure below to install expansion cards, first turn off and remove power from the system as described in section 3.1 then remove the top cover.

Installing Expansion Cards

1. Remove any slimline SAS cables connected to the riser card and pull up the riser card brackets.
2. Looking from the node rear, open the clip of each slot on the right.
3. Remove the blank PCI shield from the chassis.
4. Slide the expansion card shield into the open shield slot while plugging the expansion card into the riser card.

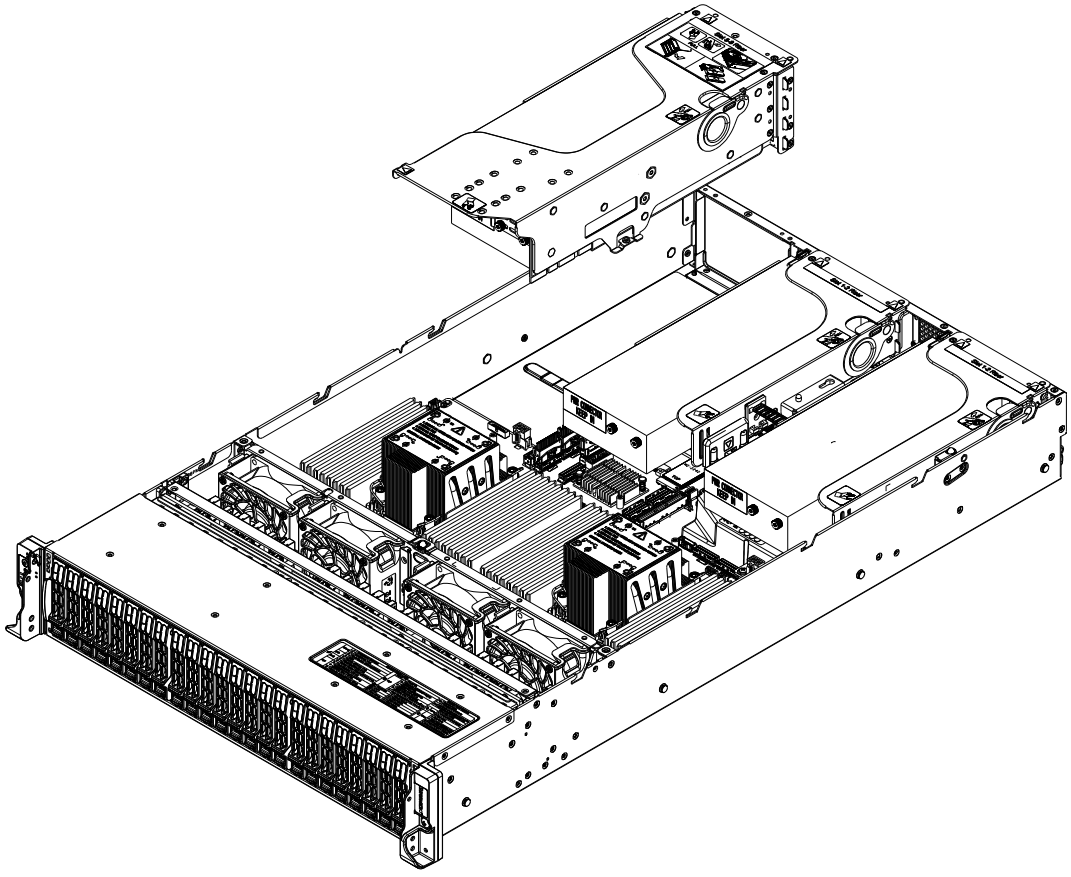
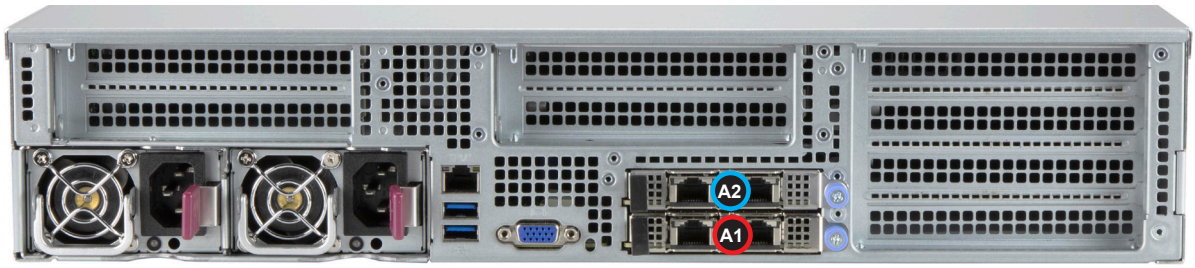


Figure 3-10. Installing Expansion Cards

3.10 AIOM Cards

The system supports up to two AIOM/OCP NIC 3.0 network port card. The second AIOM slot A2 is optional.



AIOM Configuration			
Item	**Mechanical**	**Electrical**	**Thermal**
A1	Small Form Factor, OCP 3.0	x16 (CPU1)	Up to 15W*
A2 (Optional)	Small Form Factor, OCP 3.0	x16 (CPU2)	Up to 15W*

*AIOM cards exceeding the 15W Slot Power Envelope may require restricted conditions to meet thermal specifications of the AIOM card. Contact your Supermicro account representative for more information.

Figure 3-11. AIOM Chassis Slot

Installing AIOM

1. Remove power as described in Section 3.1.
2. Remove the blank cover plate(A1 or A2), unscrewing the thumbscrew.
3. Slide the AIOM card in the opening until it seats in the AIOM board slot.
4. Secure with the thumbscrew.

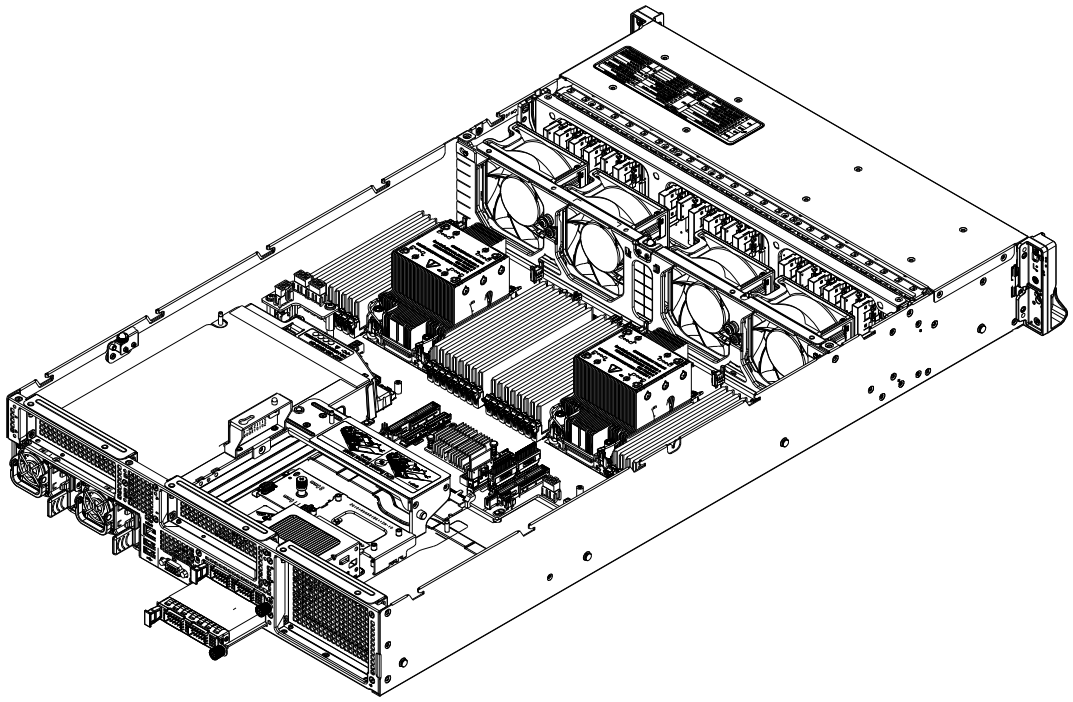


Figure 3-12. Installing AIOM

3.11 Power Supply

The system includes two hot-plug power supply modules. These modules will automatically sense and operate at an input voltage between 100V to 240V. Note that different input voltages will result in different maximum power output levels.

In the event of a power module failure, the other power module will continue to power the system on its own. Failed power supply modules can be replaced without powering down the system. Replacement modules can be ordered directly from Supermicro.

An amber light on the power supply is illuminated when the power is switched off. A green light indicates that the power supply is operating.

Replacing the Power Supply

1. Unplug the AC power cord from the failed power supply module.
2. Push and hold the release tab on the back of the power supply.
3. Grasp the handle of the power supply and pull it out of its bay.
4. Push the new power supply module into the power bay until it clicks into the locked position.
5. Plug the AC power cord back into the power supply module.

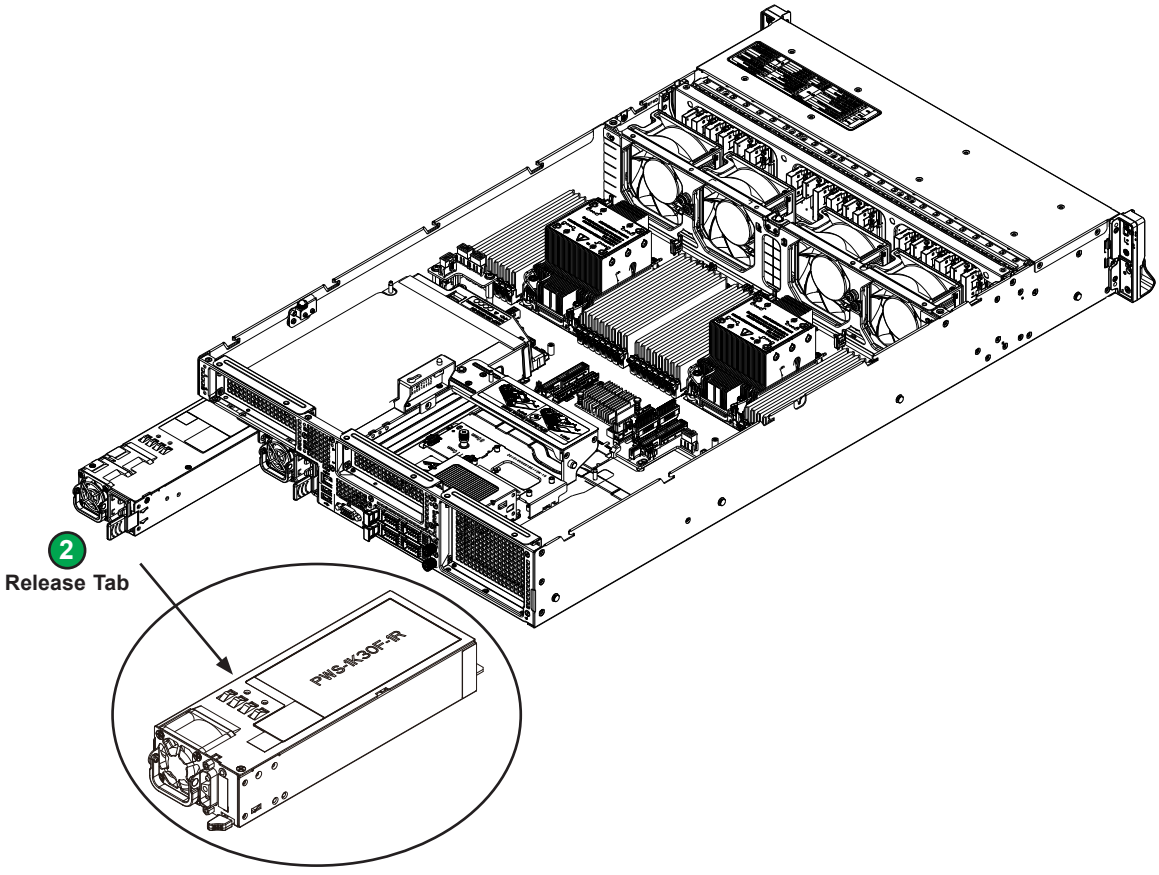
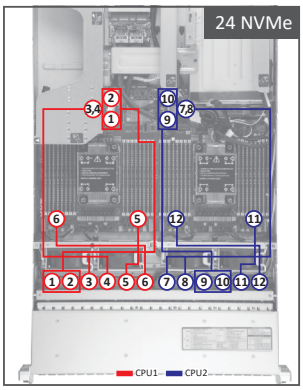


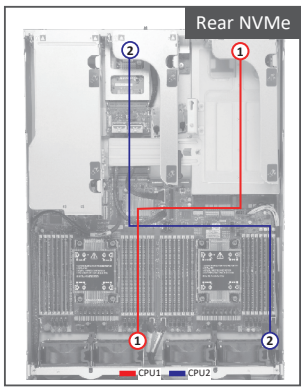
Figure 3-13. Installing a Power Supply Module

3.12 Cable Routing Diagrams

SYS-220H-TN24R supports 24 hot-swap 2.5" SAS/SATA/NVMe storage drives. SAS support can be afforded with an optional controller card and cables while SATA and NVMe support just require additional cables (refer to the optional parts list for more details). Below are the cable routing diagrams for each of these storage configurations.

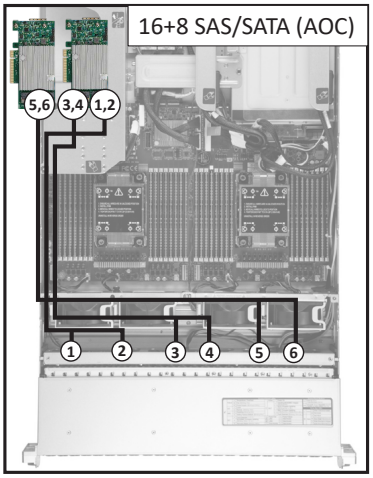
SYS-220H-TN24R Storage Cables - NVMe





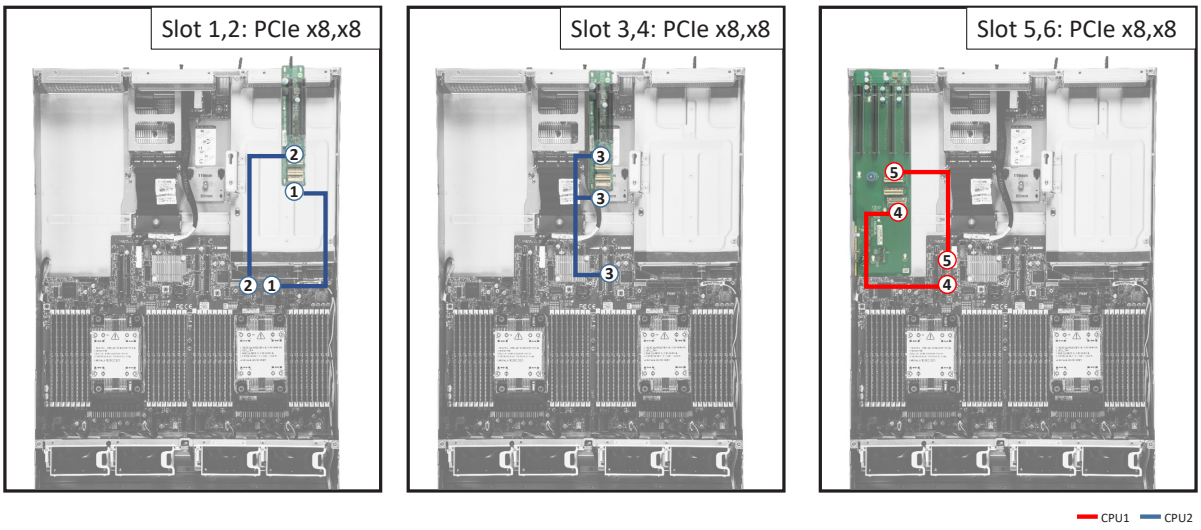
Drive Configuration	Cable Part Number	① Drive Bay 0-1	② Drive Bay 2-3	③ Drive Bay 4-5	④ Drive Bay 6-7	⑤ Drive Bay 8-9	⑥ Drive Bay 10-11	⑦ Drive Bay 12-13	⑧ Drive Bay 14-15	⑨ Drive Bay 16-17	⑩ Drive Bay 18-19	⑪ Drive Bay 20-21	⑫ Drive Bay 22-23
24 NVMe		CBL-SAST-1302LP-85	CBL-SAST-1302LP-85	CBL-GNZ4-1258-85		CBL-SAST-1303LP-85	CBL-SAST-1303LP1-85	CBL-GNZ4-1259-85		CBL-SAST-1303LP2-85	CBL-SAST-1303LP2-85	CBL-SAST-1303LP-85	CBL-SAST-1303LP1-85
Rear NVMe		CBL-SAST-1205LP2-85	CBL-SAST-1205LP2-85										

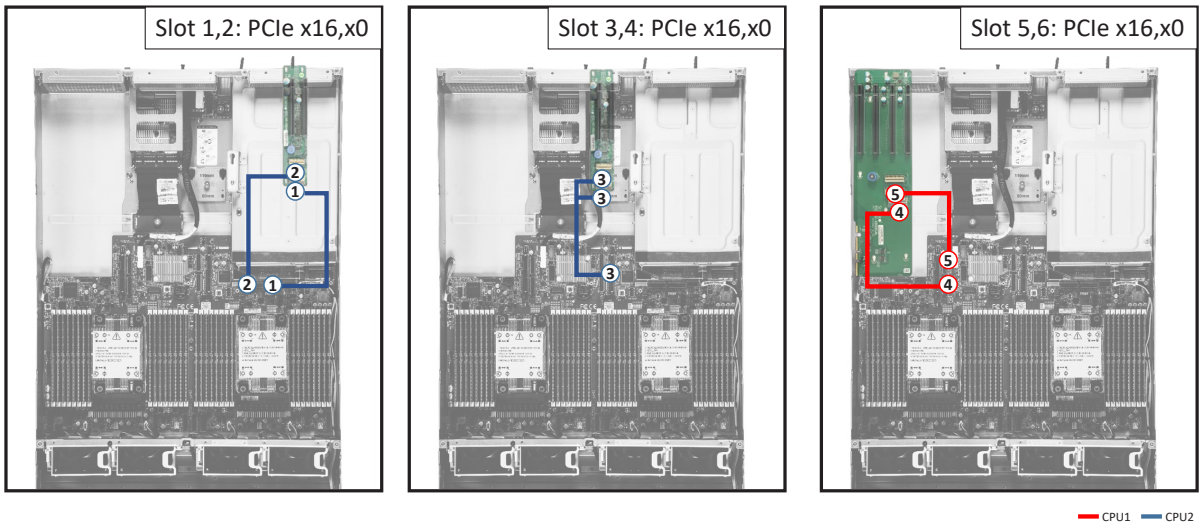
SYS-220H-TN24R Storage Cables - SAS/SATA



Drive Configuration		Cable Part Number	① Drive Bay 0-3	② Drive Bay 4-7	③ Drive Bay 8-11	④ Drive Bay 12-15	⑤ Drive Bay 16-19	⑥ Drive Bay 20-23
	16+8 SAS/SATA		CBL-SAST-1264F-100		CBL-SAST-1276F-100		CBL-SAST-1296F-100	

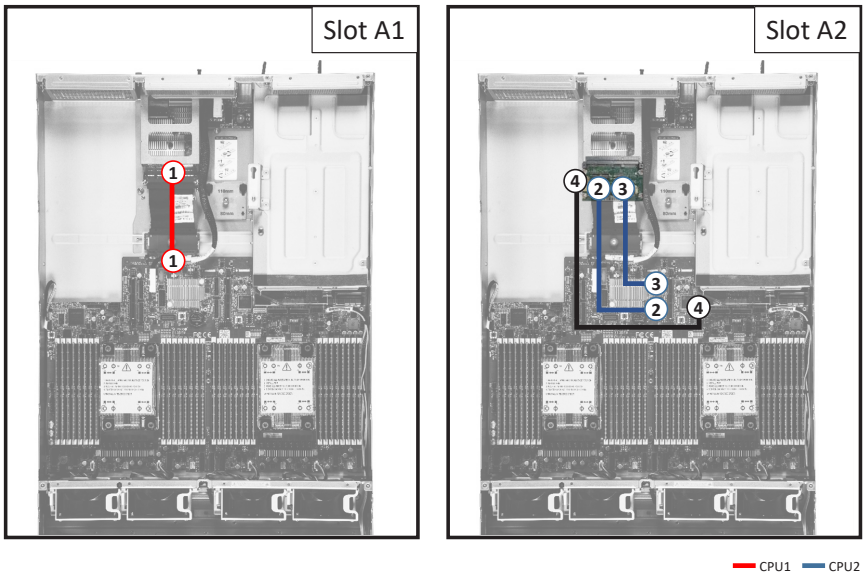
PCIe Cables - Expansion Card Slots





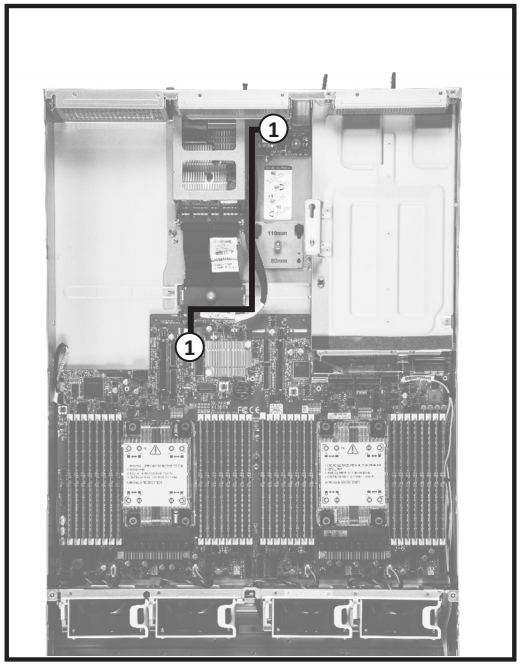
PCIe Cables - Expansion Card Slots			
Cable	**Cable Part Number**	**Connection From**	**Connection To**
1	CBL-SAST-1230LP-85	Motherboard, JPCIE5A1	Riser Card, JPCIE1A1
2	CBL-SAST-1232LP-85	Motherboard, JPCIE5B1	Riser Card, JPCIE1B1 or JPCIE2A1
3	CBL-GNZ4-1221LP-85	Motherboard, JPCIE4	Riser Card, JPCIE1A1 & JPCIE1B1 or JPCIE1A1 & JPCIE2A1
4	CBL-SAST-1222LP-85	Motherboard, JPCIE2A1	Riser Card, JPCIE1A1
5	CBL-SAST-1226LP-85	Motherboard, JPCIE2B1	Riser Card, JPCIE1B1 or JPCIE2A1

PCIe Cables - AIOM/OCP 3.0 NIC Slots



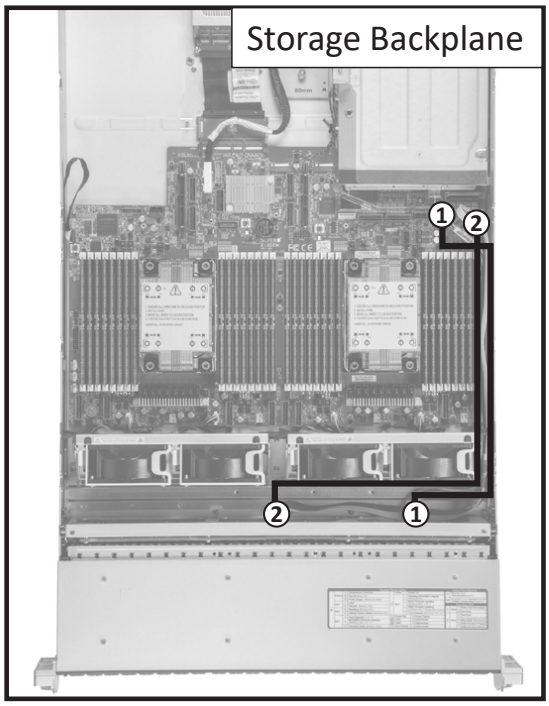
PCIe Cables - AIOM/OCP 3.0 NIC Slots			
Cable	**Cable Part Number**	**Connection From**	**Connection To**
1	CBL-GNZ4-1261-85	Motherboard, JAIOM1	AIOM/OCP 3.0 NIC
2	CBL-SAST-1218LP-85	Motherboard, JPCIE3A1	AIOM Board, JPCIE1A1
3	CBL-SAST-1218LP-85	Motherboard, JPCIE3B1	AIOM Board, JPCIE1B1
4	CBL-CDAT-1060-30	Motherboard, JAIOM2SB1	AIOM Board, JAIOMSB1

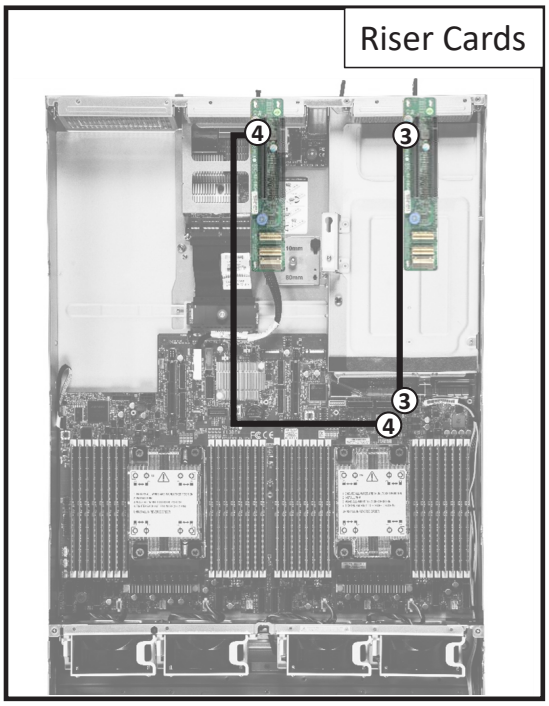
I/O Board Cable



I/O Board Cable			
Cable	**Cable Part Number**	**Connection From**	**Connection To**
1	CBL-SAST-1225LP	Motherboard, JIO1	I/O Board, JIO1

Power Cables





Power Cables			
Cable	**Cable Part Number**	**Connection From**	**Connection To**
1	CBL-PWEX-1142-60	Motherboard, JGPW5	Backplane, JPWR1
2	CBL-PWEX-1142-40	Motherboard, JGPW1	Backplane, JPWR2
3	CBL-PWEX-1136-40	Motherboard, JGPW2	Riser Card, JPWR1
4	CBL-PWEX-1136-40	Motherboard, JGPW3	Riser Card, JPWR1

*The riser card power cable(s) installed in the system may vary depending on the optional riser cards or GPUs installed in the system.

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

Two power supply connectors are located at PSU1 and PSU2. You must also connect the 8-pin 12V DC power connectors (JGPW1/JGPW2/JGPW3/JGPW4/JGPW5) to the power supply to provide adequate power to your system.

8-Pin Power Connectors

JGPW1/JGPW2/JGPW3/JGPW4/JGPW5 are 8-pin 12V DC power inputs for the system and it must be connected to the power supply. Refer to the table below for pin definitions..

8-pin Power Pin Definitions	
Pin#	**Definition**
1 - 4	Ground
5 - 8	P12V (12V Power)

Required Connection

4.2 Headers and Connectors

Fan Headers

There are eight 6-pin fan headers (FAN1 ~ FAN8) on the motherboard. A fan speed control is available by Thermal Management via the BMC interface. Refer to the table below for pin definitions.

6-pin Fan Header Pin Definitions	
Pin#	**Definition**
1	Ground
2	3A/+12V
3	Tachometer
4	PWM_Control
5	3A/12V
6	Ground

TPM/Port 80 Header

A Trusted Platform Module (JTPM1)/ Port 80 header is located at JTPM1 to provide TPM support and Port 80 connection. Use this header to enhance system performance and data security. Refer to the table below for pin definitions. 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#

NC-SI Connector

The NC-SI header (JNSCI) is used to connect a Network Interface Card (NIC) to the motherboard which will allow the onboard BMC (Baseboard Controller) to communicate with a network.

Chassis Intrusion

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

6-pin BMC External I²C Header

A System Management Bus header for BMC 2.0 is located at JF3_JIPMB1. Connect the appropriate cable here to use the IPMB I²C connection on your system. Refer to the table below for pin definitions.

NVMe SMBus Headers

NVMe SMBus (I²C) header (JNVI2C1), used for PCIe SMBus clock and data connections, provides hot-plug support via a dedicated SMBus interface. This feature is only available for a Supermicro complete system with an SMCI-proprietary NVMe add-on card and a proper cable installed. See the table below for pin definitions.

Unit Identifier (UID) Switch and UID LED Indicator

A UID switch jumper (JUIDB1) and a UID LED (LED1) are located on the motherboard. The front UID LED is located on pins 7 & 8 of the front panel control header (JFP1). When you press the rear UID switch, both front and rear UID LEDs will be turned on. Press the UID switch again to turn off the LED indicators. The UID indicators provide easy identification of a system that may be in need of service.

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

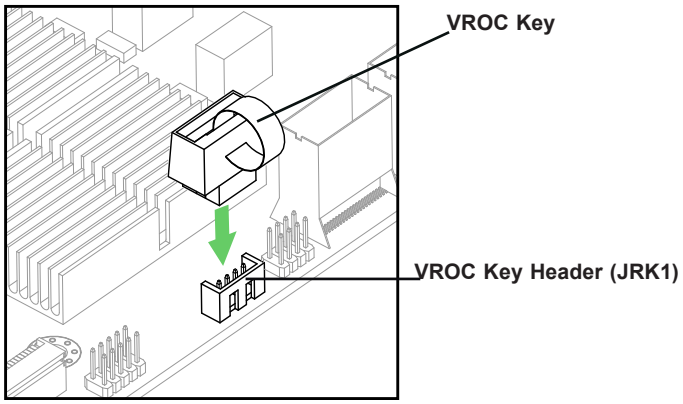
Universal Serial Bus (USB) Ports and Headers

A USB header is located at JUSB3 on the motherboard. This USB header supports two USB 3.0 connections.

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.

VRM SMBus Header

JVRM1 is a voltage regulator module (VRM) SMBus header. Use this header to program the CPU and memory VRM controllers.

SMBus Header for Riser Card

The SMBus Header for the riser card is located at JRSI2C1 on the motherboard. Please refer to the layout below for the location of JRSI2C1.

CPU VPP Bus Header for Backplane NVMe Riser Card Device

The CPU VPP Bus header for the riser card is located at JNVVPP1 on the motherboard. Please refer to the layout below for the location of JNVVPP1.

Control Panel

The front control panel header (JFP1) contains header pins for various buttons and indicators that are normally located on a control panel at the front of the chassis. These connectors are designed specifically for use with Supermicro chassis. See the figure below for the descriptions of the front control panel buttons and LED indicators.

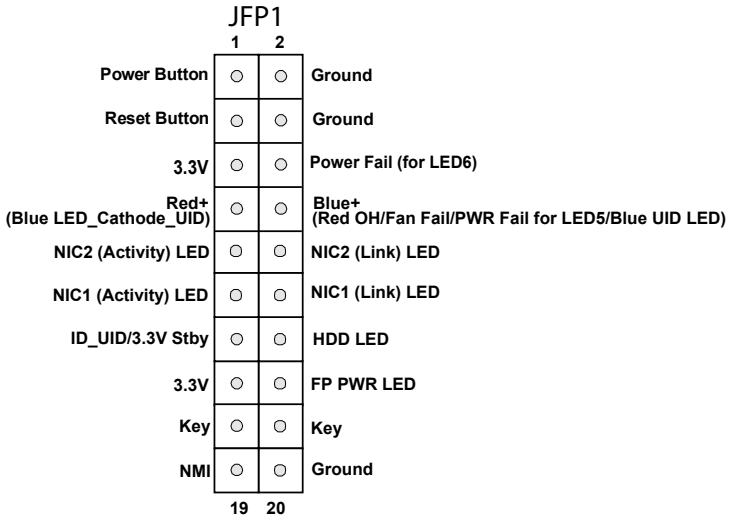


Figure 4-1. JF1 Control Panel Pins

Front Control Panel LEDs

Front Control Panel (JFP1) LED Indicators						
Event	**Power (LED1)**	**HDD (LED2)**	**LAN (LED3/4)**	**UID (LED5)**	**Information (LED5)**	**Power Fail (LED6)**
Power On	Solid On					
HDD Activity		Blinking				
NIC Activity			Blinking			
Overheat					Solid On	
Fan Fail					Blinking @1Hz	
Power Fail					Blinking @1/4Hz	Solid On
Local UID On				Solid On		
Remote UID On				Blinking 1Hz		
Checking	BMC/BIOS Blinking @4HZ					
Recovering/Updating	BMC Blinking @4HZ BMC 2 Blinks @4Hz, 1 Pause @2Hz (on-on-off-off)			BIOS/BMC Blinking @10Hz		
Flash Not Detected or Golden Image Check Failed	BMC/BIOS Blinking @1HZ					
CPLD Recovery Mode				Blinking @10Hz (MB UID LED)	Blinking @10Hz (FP Red LED)	

Power On & BMC/BIOS Status LED Button

The Power On and BMC/BIOS Status LED button is located on pins 1 and 2 of JFP1. Momentarily contacting both pins will power on/off the system or display BMC/BIOS status. Refer to the tables below for more information.

Power Button & BIOS/BMC Status LED Indicator Pin Definitions (JFP1)	
Pin#	**Definition**
1	Signal
2	Ground

Power Button LED States	
Status	**Event**
Green: solid on	System power on
BMC/BIOS blinking green @ 4Hz	BMC/BIOS checking
BIOS blinking green @ 4Hz	BIOS recovery/update in progress
BMC blinking red x2 (2 blinks red) @ 4Hz, 1 pause @ 2Hz (on-on-off-off)	BMC recovery/update in progress
BMC/BIOS blinking green @ 1Hz	Flash not detected or golden image checking failure

Reset Button

The Reset Button connection is located on pins 3 and 4 of JFP1. Momentarily contacting both pins will reset the system. Refer to the table below for pin definitions.

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

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JFP1. When this LED turns solid red, it indicates a power failure. Refer to the table below for pin definitions.

Power Fail LED Pin Definitions (JF1)	
Pin#	**Definition**
5	3.3V
6	PWR Fail for LED6 (Solid red on: PWR failure)

Information LED (OH/Fan Fail/PWR Fail/UID LED)

The Information LED (OH/Fan Fail/PWR Fail/UID LED) connection is located on pins 7 and 8 of JFP1. The LED on pin 7 is active when the UID button (JUIDB1) on the rear I/O panel is pressed. The LED on pin 8 provides warnings of overheat, power failure, or fan failure. Refer to the tables below for more information.

Information LED-Blue+ (OH/Fan Fail/PWR Fail LED for LED5/blue UID LED) LED States	
Status	**Description**
Solid red (on)	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
Blinking red (10Hz) (FP red LED)	CPLD recovery mode error(s)
Solid blue	Local UID is activated. Use this function to locate a unit in a rack mount environment that might be in need of service.
Blinking blue (1Hz)	Remote UID is on. Use this function to identify a unit from a remote location that might be in need of service.
BIOS/BMC blinking blue (10Hz)	BIOS/BMC: recovery and/or update in progress
Red Info LED blinking (10Hz) and MB UID LED blue blinking (10Hz)	CPLD: recovery and/or update in progress

NIC1/NIC2 (LAN1/LAN2)

The NIC (Network Interface Controller) LED connection for LAN port 1 is located on pins 11 and 12 of JFP1, and LAN port 2 is on pins 9 and 10. Refer to the tables below for pin definitions.

LAN1/LAN2 LED Pin Definitions (JFP1)			
Pin#	**Definition**	**Pin#**	**Definitin**
9	NIC 2 Activity LED	10	NIC 2 Link LED
11	NIC 1 Activity LED	12	NIC 1 Link LED

LAN1/LAN2 LED LED States	
Color	**State**
NIC 2: Blinking green	LAN 2: Active
NIC 1: Blinking green	LAN 1: Active

ID_UID Switch/HDD LED

The UID Switch/HDD LED connection is located on pins 13 and 14 of JFP1. The UID switch is used for a chassis that supports a front UID switch. The front UID switch functions in the same way as the rear UID switch; both are for input only and cannot be used for output.

When this LED is blinking green, it indicates HDD is active. Attach a cable to pins 13 and 14 to show ID_UID status and hard drive activity. Refer to the tables below for pin definitions.

ID_UID/HDD LED Pin Definitions (JF1)

Pins	Definition
13	ID_UID/3.3V Stdby
14	HDD Activity

ID_UID/HDD LED LED State

Color	State
Blinking Green	HDD Active

FP Power LED

The Front Panel Power LED connection is located on pins 15 and 16 of JFP1. Refer to the table below for pin definitions.

FP Power LED Pin Definitions (JFP1)

Pins	Definition
15	3.3V
16	FP PWR LED

NMI Button

The non-maskable interrupt (NMI) button header is located on pins 19 and 20 of JFP1. Refer to the table below for pin definitions.

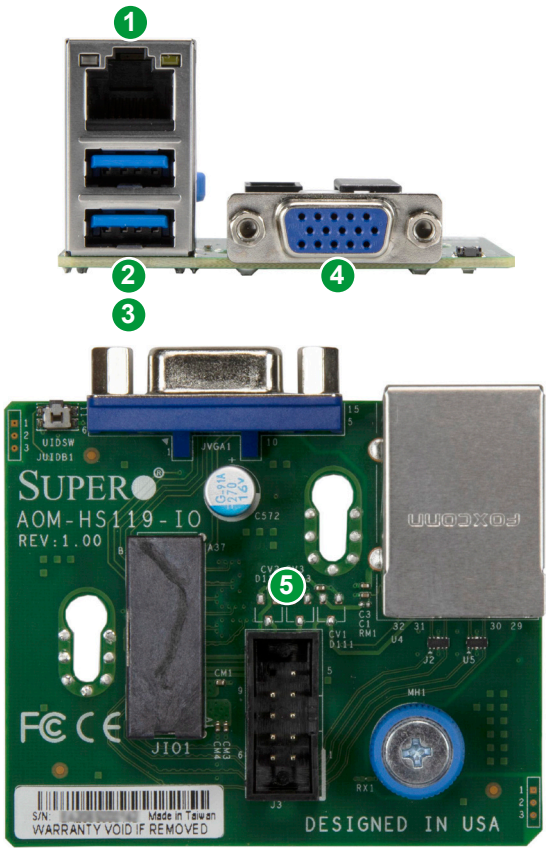
NMI Button Pin Definitions (JFP1)

Pins	Definition
19	NMI
20	Ground

4.3 Input/Output Ports

I/O Ports

The low-profile slimSAS I/O connector, located at JIO1, is used to connect the motherboard to an I/O mezzanine board, AOM-HS119-IO, to provide VGA/COM/BMC/USB connections.



I/O Ports from AOM-HS119-IO	
#	**Description**
1	BMC_LAN Port
2	USB 0 (3.0)
3	USB 1 (3.0)
4	VGA Port
5	COM Port Header

VGA Connections

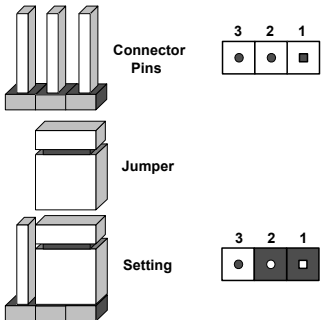
A VGA header is located at JFP2 on the motherboard. Refer to the Motherboard manual for the locations of VGA connections in its layout image.

4.4 Jumpers

Explanation of Jumpers

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. See 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.
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), and reinstall the battery to the proper location
6. Replace the cover, reconnect the power cord(s), and power on the system.

Note: Clearing CMOS will also clear all passwords. Do not use the PW_ON connector to clear CMOS.

4.5 LED Indicators

BMC Heartbeat LED

A BMC Heartbeat LED is located at LEDM1 on the motherboard. When LEDM1 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

Onboard Power LED

The onboard Power LED is located at LED2 on the motherboard. When this LED is on, the system power is on. Be sure to turn off the system power and unplug the power cord before removing or installing components. Refer to the table below for more information.

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

Unit ID LED

A unit identifier LED indicator is located at LED1 on the motherboard. This UID indicator provides easy identification of a system unit that may need service.

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

4.6 Storage Ports

I-SATA 3.0 Ports

The X12DHM-6 has an I-SATA 3.0 header (JS1) with support for eight I-SATA ports (I-SATA0~7) on the motherboard. These SATA ports are supported by the Intel C621A chipset. Refer to the Motherboard manual for the locations of JS1 in its layout image.

M.2 Slots

The X12DHM-6 motherboard has two hybrid NVMe or SATA M.2 slots (M.2-H1, M.2-H2). M.2 allows for a variety of card sizes, increased functionality, and spatial efficiency. The M.2 slot on the motherboard supports PCIe 3.0 x2 or SATA 3.0 devices in the 2280 and 22110 form factors.

NVMe Connectors

Four NVMe connectors (P1_NVME0, P1_NVME1, P2_NVME0, P2_NVME1) provide onboard NVMe connections. Use these NVMe connectors to attach high-speed PCIe storage devices.

Note: When installing an NVMe device on a motherboard, please be sure to connect the first NVMe port first (P1_NVME0/P2_NVME0) for your system to work properly.

Chapter 5

Software

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

5.1 Microsoft Windows OS Installation

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

Installing the OS

1. Create a method to access the MS Windows installation ISO file. That might be a DVD, perhaps using an external USB/SATA DVD drive, or a USB flash drive, or the IPMI KVM console.

2. Retrieve the proper RST/RSTe driver. Go to the Supermicro web page for your motherboard and click on "Download the Latest Drivers and Utilities", select the proper driver, and copy it to a USB flash drive.

3. Boot from a bootable device with Windows OS installation. You can see a bootable device list by pressing **F11** during the system startup.

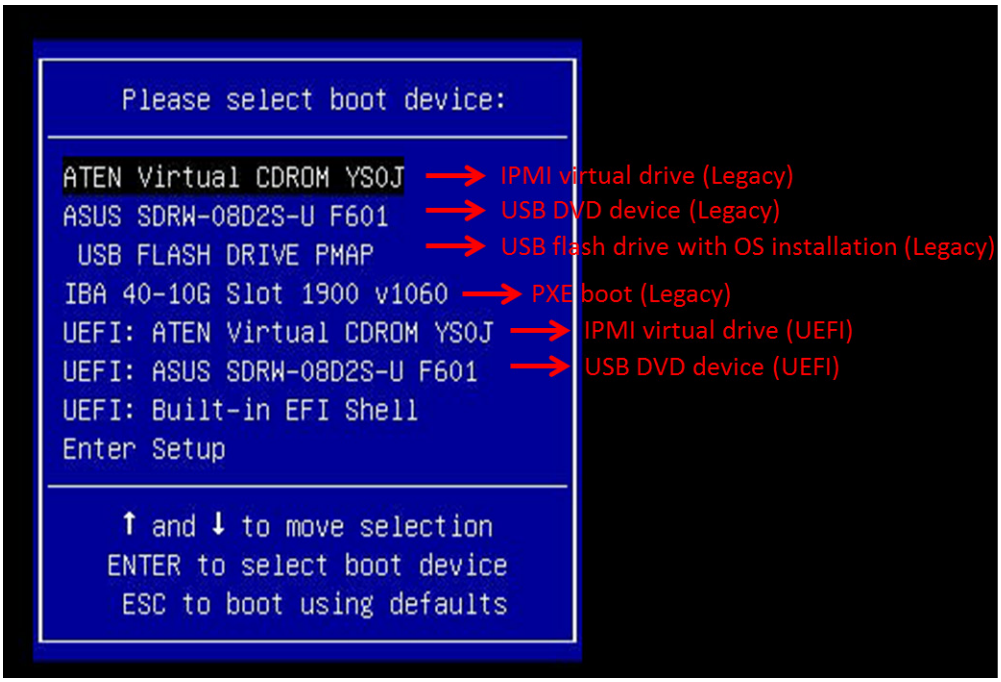


Figure 5-1. Select Boot Device

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

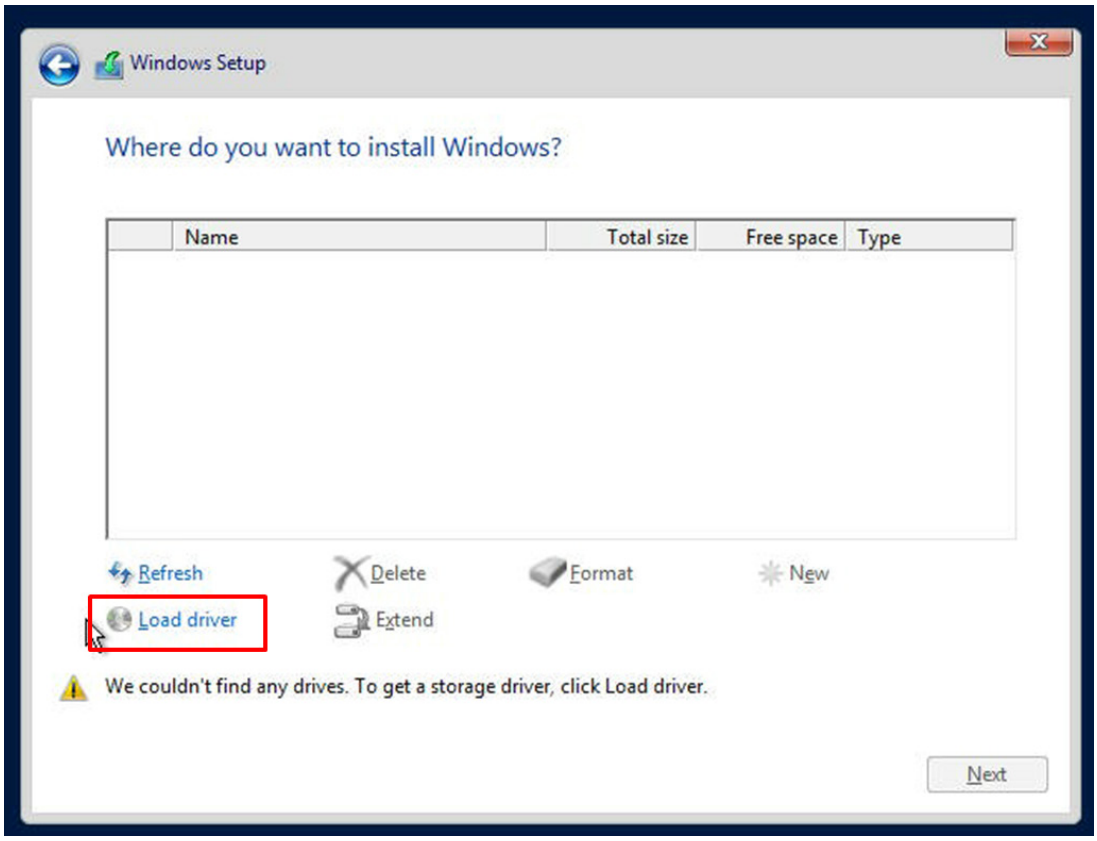


Figure 5-2. Load Driver Link

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

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

5. Once all devices are specified, continue with the installation.
6. After the Windows OS installation has been 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.

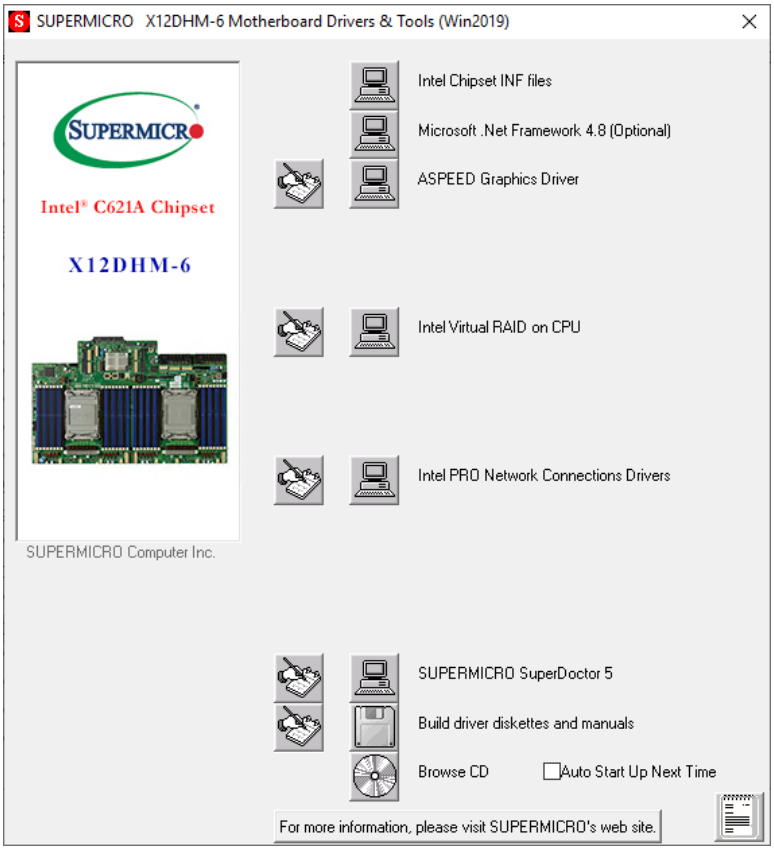


Figure 5-3. Driver and Tool Installation Screen

Note: Click the icons showing handwriting 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 reboot 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 content.

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) IPMI, you can remotely control power ON/OFF and reset chassis intrusion for multiple systems. SuperDoctor 5 Management Server monitors HTTP, FTP, and SMTP services to optimize the efficiency of your operation.

SuperDoctor® Manual and Resources

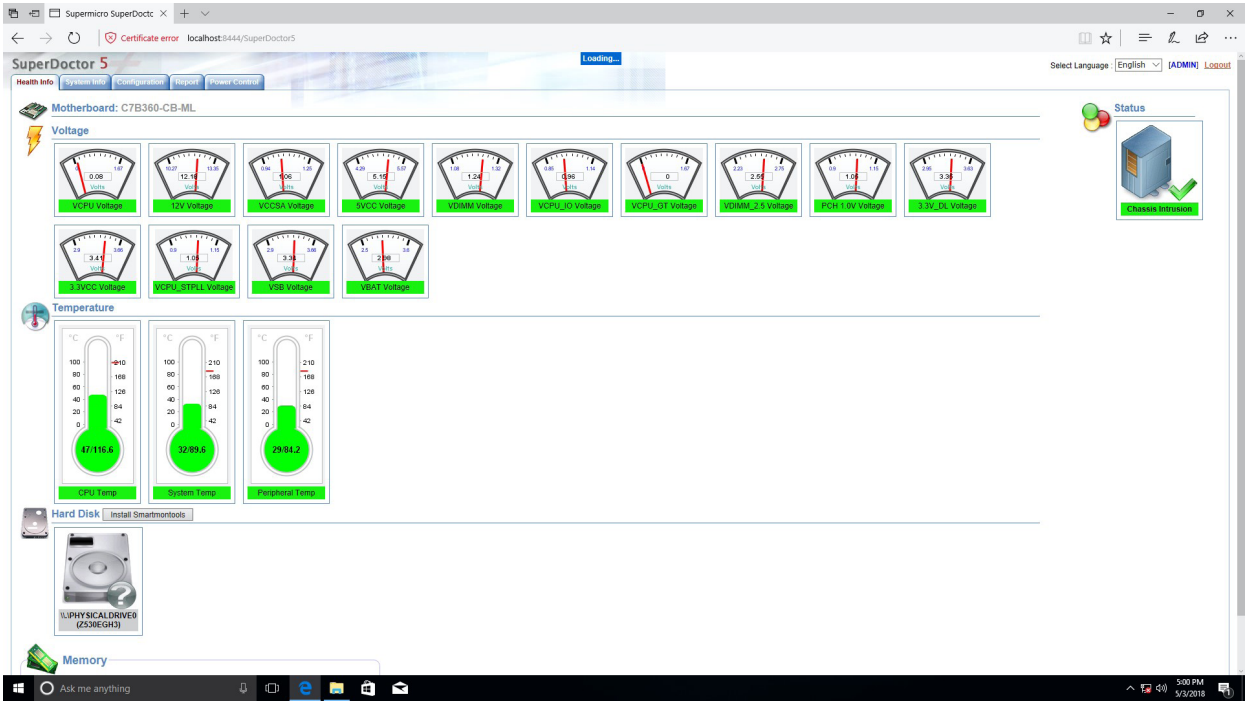


Figure 5-4. SuperDoctor 5 Interface Display Screen (Health Information)

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.

BMC ADMIN User Password

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



Figure 5-5. BMC Password Label

See Chapter 1 for the label location.

Chapter 6

Optional Components

This chapter describes alternate configurations and optional system components.

Optional Parts
Storage drive options
Power options
Cable Management Arm
TPM security module
Intel VROC RAID Key

6.1 Storage Drive Options

The storage drive bays can support SATA, SAS, and NVMe in any combination. To enable SAS, SATA, 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 system can support up to eight SATA drives from the onboard Intel PCH SATA controller.

SAS – The system can support eight, sixteen, or twenty-four SAS drives with one of the supported add-on storage controller cards below.

NVMe – The system can support eight, sixteen, or twenty-four NVMe drives.

6.2 Configuration Ordering Information

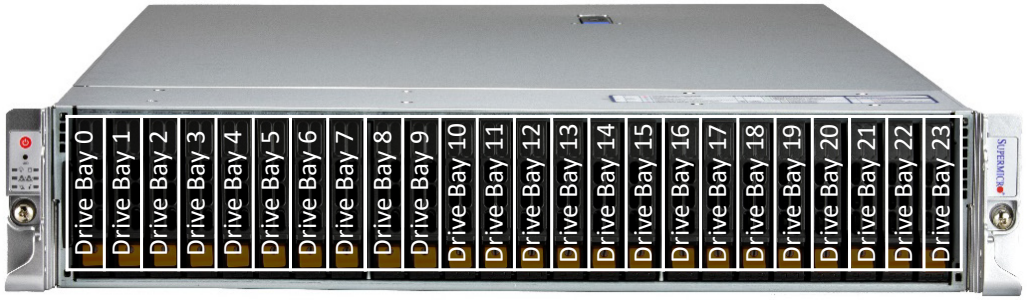
Hyper 2U SYS-220H-TN24R Drive Bay Configuration Options



Option 1: 24 NVMe		
Drive Bay #	**Drive Type**	**Part Numbers**
Drive Bays 0-11	NVMe (from CPU1)	CBL-CDAT-1061 CBL-GNZ4-1258-85 CBL-GNZ4-1259-85 CBL-SAST-1302LP-85 (x2) CBL-SAST-1303LP-85 (x2) CBL-SAST-1303LP1-85 (x2) CBL-SAST-1303LP2-85 (x2)
Drive Bays 12-23	NVMe (from CPU2)	

Option 2: 16 SAS/SATA + 8 SAS/SATA		
Drive Bay #	**Drive Type**	**Part Numbers**
Drive Bays 0-15	SAS/SATA (controller 1)	CBL-SAST-1264F-100 CBL-SAST-1276F-100 CBL-SAST-1296F-100 CBL-CDAT-1062 For Non-RAID: AOC-S3816L-L16IT-O* AOC-S3808L-L8IT-O* For Hardware RAID: AOC-S3916L-H16IR-32DD-O* AOC-S3908L-H8IR-16DD-O*
Drive Bays 16-23	SAS/SATA (controller 2)	

***AOCs need to be installed in PCIe slots 7-8, so adding PCIe slot 5-8 with configuration option 1 or 2 is needed.**





Option 3: 16 SAS/SATA + 8 SAS/SATA + 2 NVMe		
Drive Bay #	**Drive Type**	**Part Numbers**
Drive Bays 0-15	SAS/SATA (controller 1)	MCP-240-21104-0N CBL-SAST-1205LP2-85 CBL-SAST-1264F-100 CBL-SAST-1276F-100 CBL-SAST-1296F-100 CBL-PWEX-1152Y-30 LBL-0968 For Non-RAID: AOC-S3816L-L16IT-O* AOC-S3808L-L8IT-O* For Hardware RAID: AOC-S3916L-H16IR-32DD-O* AOC-S3908L-H8IR-16DD-O*
Drive Bays 16-23	SAS/SATA (controller 2)	
Rear Drive Bays 0-1	NVMe (from CPU1)	

***AOCs need to be installed in PCIe slots 7-8, so adding PCIe slot 5-8 with configuration option 1 or 2 is needed.**

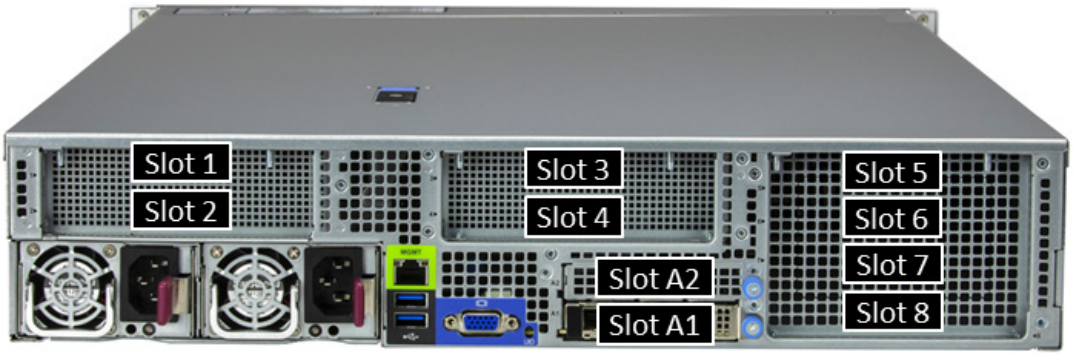
Option 4: 16 SAS/SATA + 8 SAS/SATA + 4 NVMe		
Drive Bay #	**Drive Type**	**Part Numbers**
Drive Bays 0-15	SAS/SATA (controller 1)	MCP-240-21104-0N (x2) MCP-120-82927-0N CBL-SAST-1205LP2-85 (x2) CBL-SAST-1264F-100 CBL-SAST-1276F-100 CBL-SAST-1296F-100 CBL-PWEX-1152Y-30 LBL-0968 For Non-RAID: AOC-S3816L-L16IT-O* AOC-S3808L-L8IT-O* For Hardware RAID: AOC-S3916L-H16IR-32DD-O* AOC-S3908L-H8IR-16DD-O*
Drive Bays 16-23	SAS/SATA (controller 2)	
Rear Drive Bays 0-1	NVMe (from CPU1)	
Rear Drive Bays 2-3	NVMe (from CPU2)	

***AOCs need to be installed in PCIe slots 7-8, so adding PCIe slot 5-8 with configuration option 1 or 2 is needed.**

Hyper 2U SYS-220H-TN24R PCIe Slot Configuration Options

For Drive Bay Configuration Option 1 (24 NVMe)

Slots 1-2 Configuration Options



Default: No PCIe Slots		
Slot #	**Slot Config**	**Part Numbers**
Slot 1	Not Available	MCP-120-21101-0N (Included with system)
Slot 2	Not Available	

Option 1: 2 PCIe x8 Slots		
Slot #	**Slot Config**	**Part Numbers**
Slot 1	PCIe 4.0 x8 (CPU2)	MCP-240-21102-0N RSC-H2-68G4 CBL-SAST-1230LP-85 CBL-SAST-1232LP-85 CBL-PWEX-1136-40
Slot 2	PCIe 4.0 x8 (CPU2)	

Option 2: 1 PCIe x16 Slot		
Slot #	**Slot Config**	**Part Numbers**
Slot 1	PCIe 4.0 x16 (CPU2)	MCP-240-21102-0N RSC-H2-68G4 CBL-SAST-1230LP-85 CBL-SAST-1232LP-85 CBL-PWEX-1136-40
Slot 2	Not Available	

Slots 3-4 Configuration Options

Default: No PCIe Slots		
Slot #	**Slot Config**	**Part Numbers**
Slot 3	Not Available	MCP-120-21101-0N (Included with system)
Slot 4	Not Available	

Slots 5-8 Configuration Options

Default: No PCIe Slots		
Slot #	**Slot Config**	**Part Numbers**
Slot 5	Not Available	MCP-120-21902-0N (Included with system)
Slot 6	Not Available	
Slot 7	Not Available	
Slot 8	Not Available	

Slot A1 (AIOM/OCP NIC Slot1) comes with the system.
Slot A2 (AIOM/OCP NIC Slot2) cannot be used in this 24 NVMe drive bay configuration.

For Drive Bay Configuration Options excluding 24 NVMe

Slots 1-2 Configuration Options

Default: No PCIe Slots		
Slot #	**Slot Config**	**Part Numbers**
Slot 1	Not Available	MCP-120-21101-0N (Included with system)
Slot 2	Not Available	

2 PCIe x8 Slots		
Slot #	**Slot Config**	**Part Numbers**
Slot 1	PCIe 4.0 x8 (CPU2)	MCP-240-21102-0N RSC-H2-68G4 CBL-SAST-1230LP-85 CBL-SAST-1232LP-85 CBL-PWEX-1136-40
Slot 2	PCIe 4.0 x8 (CPU2)	

1 PCIe x16 Slot		
Slot #	**Slot Config**	**Part Numbers**
Slot 1	PCIe 4.0 x16 (CPU2)	MCP-240-21102-0N RSC-H2-68G4 CBL-SAST-1230LP-85 CBL-SAST-1232LP-85 CBL-PWEX-1136-40
Slot 2	Not Available	

Slots 3-4 Configuration Options

Default: No PCIe Slots		
Slot #	**Slot Config**	**Part Numbers**
Slot 3	Not Available	MCP-120-21101-0N (Included with system)
Slot 4	Not Available	

2 PCIe x8 Slots		
Slot #	**Slot Config**	**Part Numbers**
Slot 3	PCIe 4.0 x8 (CPU2)	MCP-240-21102-0N MCP-120-82927-0N RSC-H2-68G4 CBL-GNZ4-1221LP-85 CBL-PWEX-1136-40
Slot 4	PCIe 4.0 x8 (CPU2)	

1 PCIe x16 Slot		
Slot #	**Slot Config**	**Part Numbers**
Slot 3	PCIe 4.0 x16 (CPU2)	MCP-240-21102-0N MCP-120-82927-0N RSC-H2-68G4 CBL-GNZ4-1221LP-85 CBL-PWEX-1136-40
Slot 4	Not Available	

Slots 5-8 Configuration Options

Default: No PCIe Slots		
Slot #	**Slot Config**	**Part Numbers**
Slot 5	Not Available	MCP-120-21902-0N (Included with system)
Slot 6	Not Available	
Slot 7	Not Available	
Slot 8	Not Available	

Option 1: 4 PCIe x8 Slots		
Slot #	**Slot Config**	**Part Numbers**
Slot 5	PCIe 4.0 x8 (CPU1)	MCP-240-21905-0N RSC-H2-6888G4L CBL-SAST-1222LP-85 CBL-SAST-1226LP-85
Slot 6	PCIe 4.0 x8 (CPU1)	
Slot 7	PCIe 4.0 x8 (CPU1)	
Slot 8	PCIe 4.0 x8 (CPU1)	

Option 2: 1 PCIe x16 Slot & 2PCIe x8 Slots		
Slot #	**Slot Config**	**Part Numbers**
Slot 5	PCIe 4.0 x16 (CPU1)	MCP-240-21905-0N RSC-H2-6888G4L CBL-SAST-1222LP-85 CBL-SAST-1226LP-85
Slot 6	Not Available	
Slot 7	PCIe 4.0 x8 (CPU1)	
Slot 8	PCIe 4.0 x8 (CPU1)	

Option 3: 2 PCIe x16 Slots		
Slot #	**Slot Config**	**Part Numbers**
Slot 5	PCIe 4.0 x16 (CPU1)	MCP-240-21905-0N RSC-H2-68G4 RSC-H-66G4L CBL-SAST-1222LP-85 CBL-SAST-1226LP-85 CBL-PWEX-1136-40
Slot 6	Not Available	
Slot 7	PCIe 4.0 x16 (CPU1)	
Slot 8	Not Available	

Slot A1 (AIOM/OCP NIC Slot1) comes with the system.
Slot A2 (AIOM/OCP NIC Slot2) is optional. To enable this slot add MCP-120-82926-0N, CBL-CDAT-1060-30, CBL-SAST-1218LP-85 (x2), AOM-AIOM-2X8-P.

6.3 Power Supply Modules

Power Supply Module Options		
Watts	**Part Number**	**80Plus Level**
1200	PWS-1K24A-1R	Titanium
1600	PWS-1K63A-1R (default in SYS-220H-TN24R)	Titanium
2600	PWS-2K63A-1R	Titanium

6.4 Cable Management Arm

The system supports a cable management arm (CMA), which keeps the rear cables organized and clear of the rail mechanisms when the system is extended out the front of the rack for maintenance.

The CMA attaches to the rack mounting rails using four connectors. They are labeled on the connectors 1, 2, 3, and 4.

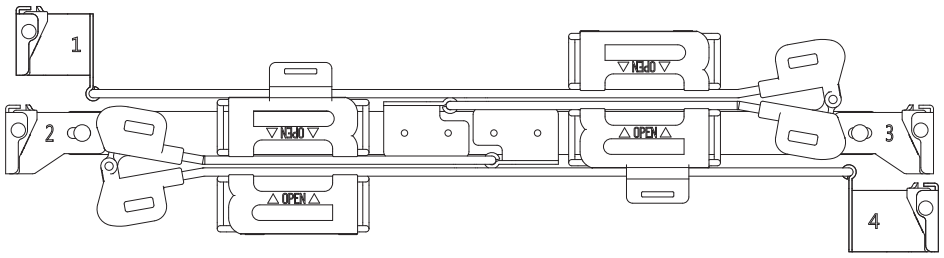


Figure 6-1. Cable Management Arm

Cable Arm Details		
Optional Part	**Part Number**	**Description**
Cable Arm	MCP-290-00168-0N	7.5" deep cable arm
Rail Set	MCP-290-11901-0N	41.2" rails (optimized for 1200 mm deep racks)

Installing the Cable Management Arm

1. Slide CMA connector #1 forward onto the two posts on the rear of the right *inner* rail (right side when viewed from the front). It snaps into place.
2. Slide CMA connector #2 forward onto the two posts on the rear of the right *middle* rail. It snaps into place.

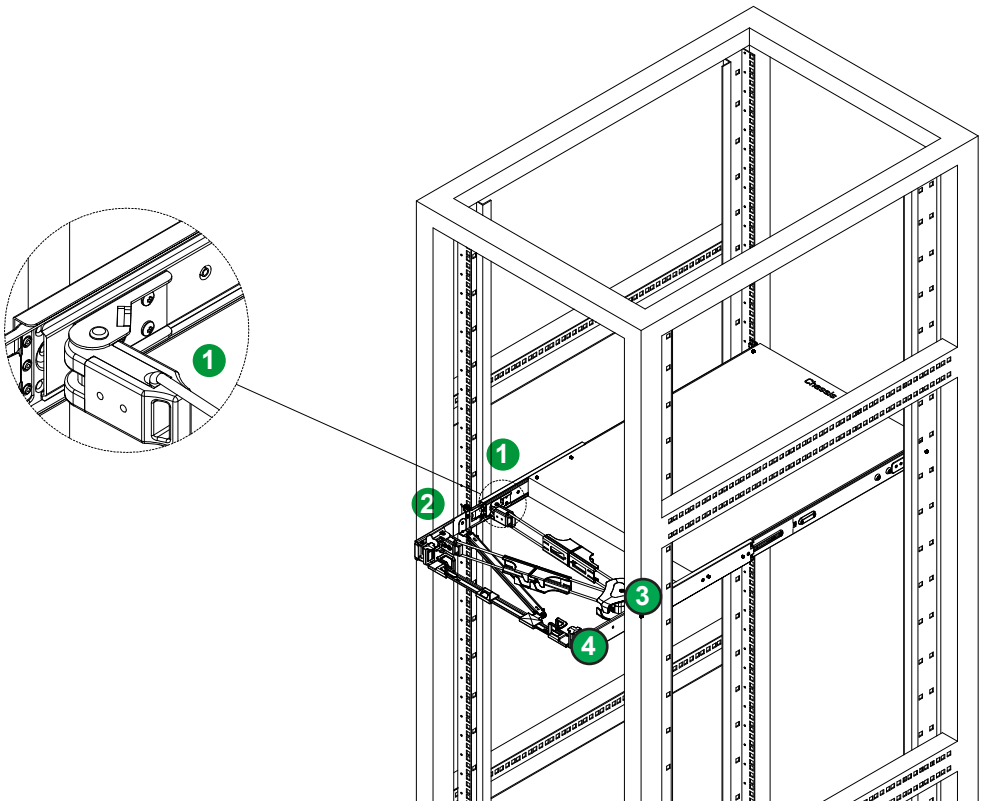


Figure 6-2. Installing the Connectors

3. Slide CMA connector #3 forward onto the two posts on the rear of the left middle rail. It snaps into place.
4. For CMA connector #4, align the metal tabs with the slots on the rear of the left outer rail and push it forward. It snaps into place.
5. Route the cables through the holding brackets, leaving enough slack.

Removing the Cable Management Arm

1. Remove cables from the CMA,
2. For CMA connector #4, pull the metal release tab toward the center of the rack and slide the connector toward the rear to release it.
3. For CMA connectors #3, #2, and #1, depress the front edge of the yellow plastic rocker lock and slide the connector toward the rear to release it.

6.5 TPM Security Module

SPI capable TPM 2.0 (or 1.2) with Infineon 9670 controller, vertical form factor

The JTPM1 header is used to connect a Trusted Platform Module (TPM). A TPM is a security device that supports encryption and authentication in hard drives. It enables the motherboard to deny access if the TPM associated with the hard drive is not installed in the system.

Details and installation procedures are at:

http://www.supermicro.com/manuals/other/TPM.pdf.

- AOM-TPM-9670V
- AOM-TPM-9671V

6.6 Intel Virtual RAID on CPU (VROC)

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.

Stripe 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 Sytems

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

Additional Information

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

www.supermicro.com/products/accessories/addon/AOC-VROCxxxMOD.cfm

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

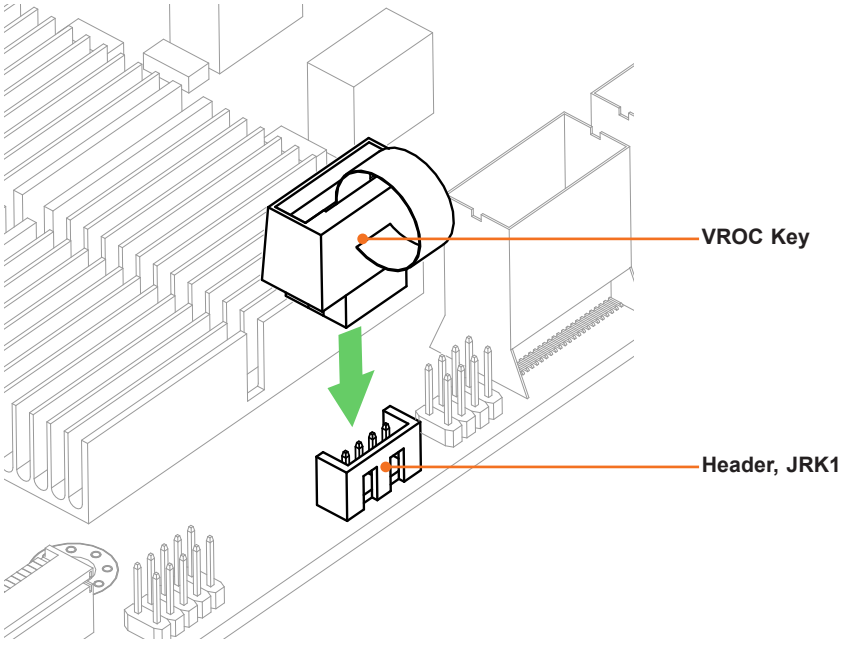


Figure 6-3. Intel VROC RAID Key and Motherboard Connector JRK1

Configuring Intel VMD

VMD must be enabled on PCIe ports which have NVMe drives attached to them in order for those drives to be added to a VROC RAID configuration. The default BIOS setting for the NVMe Mode Switch is **Auto** which automatically enables VMD on all installed NVMe drives.

NVMe Mode Switch :

- **Auto** Enables VMD for all NVMe ports if VROC Key is installed.
- **VMD** Enables VMD for all NVMe ports despite the lack of the VROC Key.
- **Manual** Allows the user to select specific NVMe ports on which to enable VMD.

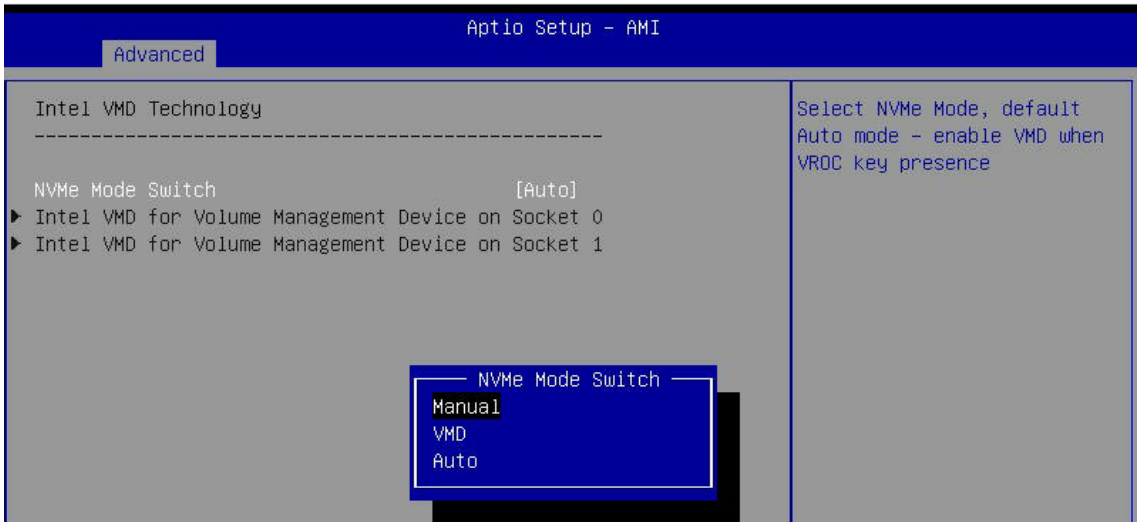
The NVMe Mode Switch can be viewed or selected at **BIOS > Advanced > Chipset Configuration > North Bridge > IIO Configuration > Intel® VMD Technology**.

Note: Without a VROC Key, there is no RAID support with the **Auto** switch. Only RAID 0 is supported with the **VMD** and **Manual** switches.

Configuring VMD Manually

The steps for manually configuring VMD on specific NVMe ports in UEFI BIOS are shown below. Example screenshots may differ from your server.

1. Reboot the server and press [DEL] key to access the BIOS options.
2. Switch to **Advanced > Chipset Configuration > North Bridge > IIO Configuration > Intel® VMD Technology**.
3. Select **VMD Mode Switch**, then select **Manual**.



Caution: VMD must only be enabled on NVMe port resources. If VMD is enabled on other PCIe ports, the functionality of those ports will be impacted. See the table below.

Figure 6-4. BIOS, Selecting VMD Mode

This table identifies the NVMe Port Resources in the X12 Hyper Servers. Enable VMD on the NVMe drive's corresponding hardware stack according to the VMD BIOS Settings table.

Intel VMD BIOS Settings				
System Model	**CPU1**	**NVMe Slots**	**CPU2**	**NVMe Slots**
SYS-120H-TNR 12 NVMe	VMD Config for PCH Ports: PCH Root Port 0 PCH Root Port 4	M.2 A,B		
	VMD on IOU 4: VMD port 5A VMD port 5B VMD port 5C VMD port 5D	NVMe 0,1,2,3	VMD on IOU 0: VMD port 1A VMD port 1B VMD port 1C VMD port 1D	NVMe 4,5,6,7
			VMD on IOU 4: VMD port 5A VMD port 5B VMD port 5C VMD port 5D	NVMe 8,9,10,11
SYS-120H-TNR 8 NVMe	VMD Config for PCH Ports: PCH Root Port 0 PCH Root Port 4	M.2 A,B		
	VMD on IOU 4: VMD port 5A VMD port 5B VMD port 5C VMD port 5D	NVMe 0,1,2,3	VMD on IOU 4: VMD port 5A VMD port 5B VMD port 5C VMD port 5D	NVMe 4,5,6,7
SYS-120H-TNR 4 NVMe	VMD Config for PCH Ports: PCH Root Port 0 PCH Root Port 4	M.2 A,B		
			VMD on IOU 4: VMD port 5A VMD port 5B VMD port 5C VMD port 5D	NVMe 8,9,10,11
SYS-620H-TN12R 12 NVMe (0-11) 4 NVMe (0-3)	VMD Config for PCH Ports: PCH Root Port 0 PCH Root Port 4	M.2 A,B		
	VMD on IOU 4: VMD port 5A VMD port 5B VMD port 5C VMD port 5D	NVMe 0,1,2,3	VMD on IOU 0: VMD port 1A VMD port 1B VMD port 1C VMD port 1D	NVMe 4,5,6,7
			VMD on IOU 4: VMD port 5A VMD port 5B VMD port 5C VMD port 5D	NVMe 8,9,10,11

Intel VMD BIOS Settings				
SYS-220H-TN24R: 24NVMe (0-23), 16 NVMe (0-15) + 8 SAS, 8 NVMe (0-7) +16 SAS	VMD Config for PCH Ports: PCH Root Port 0 PCH Root Port 4	M.2 A,B		
	VMD on IOU 1: VMD port 2A VMD port 2B VMD port 2C VMD port 2D	NVMe 0,1,2,3	VMD on IOU 1: VMD port 2A VMD port 2B VMD port 2C VMD port 2D	NVMe 12,13,14,15
	VMD on IOU 3: VMD port 4A VMD port 4B VMD port 4C VMD port 4D	NVMe 4,5,6,7	VMD on IOU 3: VMD port 4A VMD port 4B VMD port 4C VMD port 4D	NVMe 16,17,18,19
	VMD on IOU 4: VMD port 5A VMD port 5B VMD port 5C VMD port 5D	NVMe 8,9,10,11	VMD on IOU 4: VMD port 5A VMD port 5B VMD port 5C VMD port 5D	NVMe 20,21,22,23

4. Select “Intel VMD for Volume Management Device on” on CPU1 or CPU2 to enable VMD for devices under the respective CPU.



Figure 6-5. Intel VMD for Volume Management Device on CPU1 and CPU2

5. Choose Enable for “Enable/Disable VMD” for IOU 1 to list the available devices under IOU 1.

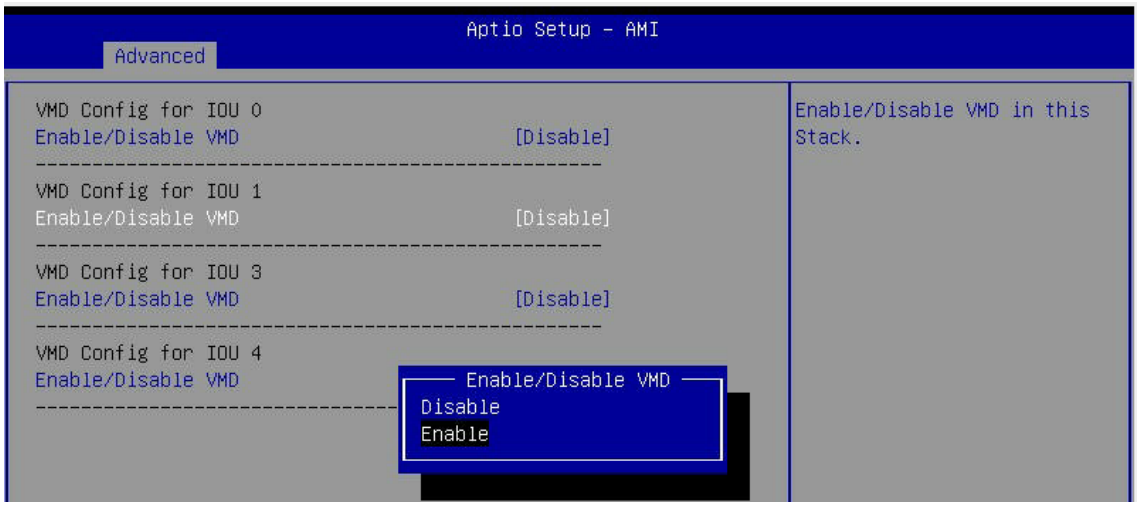


Figure 6-6. BIOS, Enabling VMD on devices under CPU2 (Example)

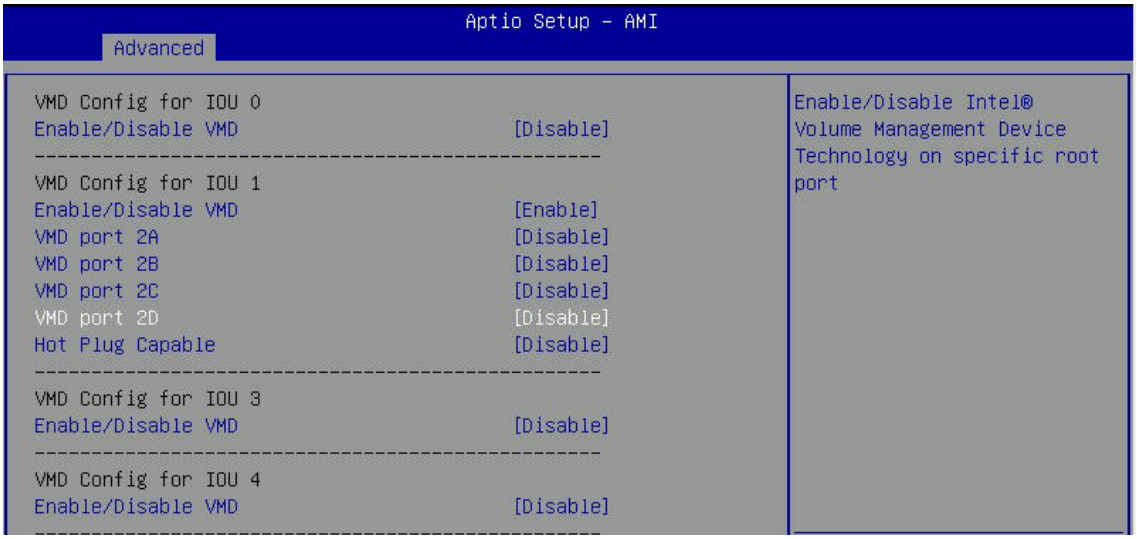


Figure 6-7. BIOS, Enabling VMD on CPU 2 (Example)

6. Enable the NVMe port resource according to table above for the NVMe drives that will be used in a RAID configuration.

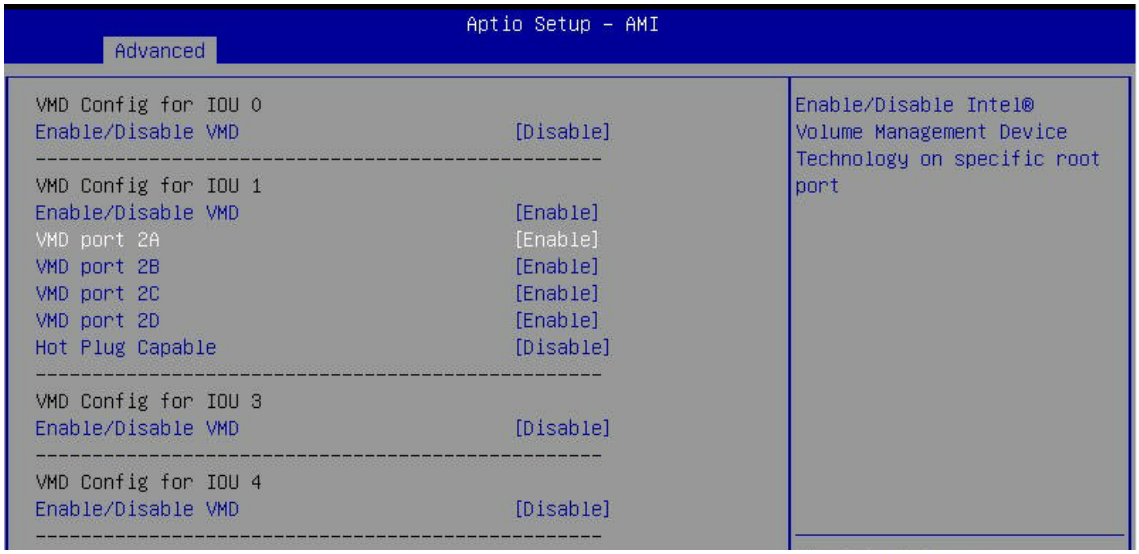


Figure 6-8. BIOS, Enabling CPU2 (Example)

7. Choose whether to make the NVMe drives in this IOU **Hot Plug Capable** by selecting Enabled or Disabled.

8. Repeat steps 4 through 7 for each IOU # on each CPU to enable VMD on the desired NVMe ports.

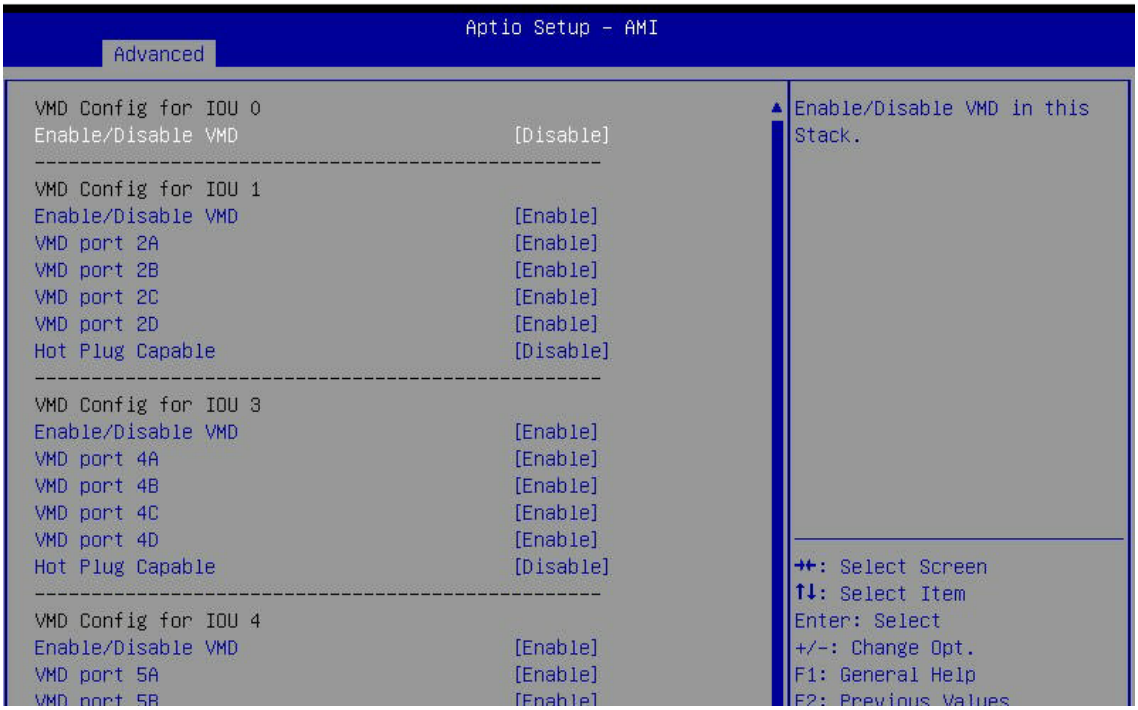


Figure 6-9. BIOS, Enabling CPU2 Completed (Example, SYS-220H-TN24R)

9. Press [F4] to save the configuration and reboot the system.

Note: If there is an existing RAID configuration, delete the RAID volume associated with the VMD controller before disabling the controller. Failure to do so may lead to unexpected behavior.

Note: The effects of physically changing or swapping a CPU on the VMD controller have not been thoroughly tested or documented.

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

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 the 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

Chapter 7

Troubleshooting and Support

7.1 Information Resources

Website

A great deal of information is available on the Supermicro website, supermicro.com.



Figure 7-1. Supermicro Website

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

Direct Links for the SYS-220H-TN24R System

SYS-220H-TN24R specifications page

X12DHM-6 motherboard page for links to the Quick Reference Guide, User Manual, validated storage drives, etc.

Direct Links for General Support and Information

Frequently Asked Questions

TPM User Guide

General Memory Configuration Guide: X12

SuperDoctor5 Large Deployment Guide

For validated memory, see our Product Resources page

Direct Links (continued)

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 BMC Interface

The system supports the Baseboard Management Controller (BMC) interface. 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/manuals/other/BMC_Users_Guide_X12_H12.pdf.

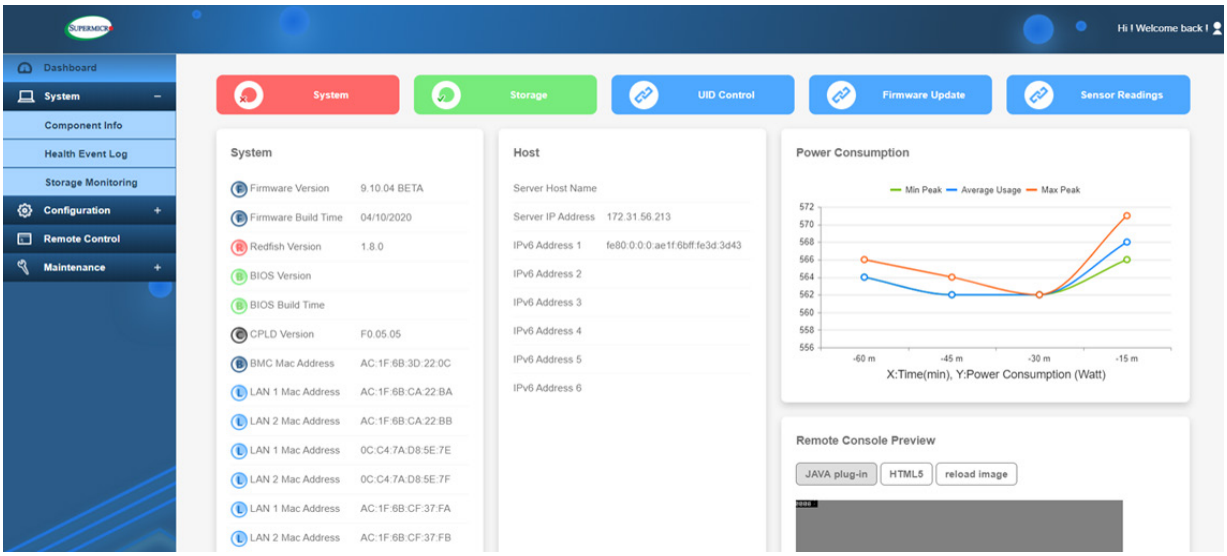


Figure 7-2. BMC Dashboard

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 sections in this chapter. Power down the system before changing any non hot-swap hardware components.

General Technique

If you experience unstable operation or get no boot response, try:

1. With power off, remove all but one DIMM and other added components, such as add-on cards, from the motherboard. Make sure the motherboard is not shorted to the chassis.
2. Set all jumpers to their default positions.
3. Power up. If the system boots, check for memory errors and add-on card problems.

No Power

- Check that the power LED on the motherboard is on.

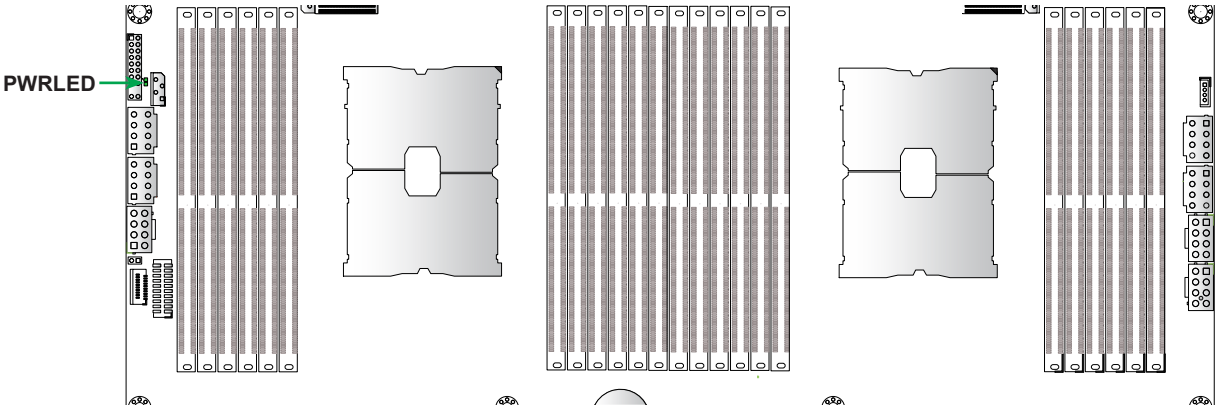


Figure 7-3. Location of the MB Power LED

- Make sure that the power connector is connected to the power supply.
- Check that the motherboard battery still supplies approximately 3VDC. If it does not, replace it.
- Check that the system input voltage is 100-120VAC or 180-240VAC.
- Turn the power switch on and off to test the system

No Video

If the power is on but you have no video, remove all add-on cards and cables.

System Boot Failure

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

- Make sure that the DIMM modules are properly and fully installed.
- 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 3.5 for memory details.
- Check for bad DIMM modules or slots by swapping modules between slots and noting the results.

Losing the System Setup Configuration

- Use a high quality power supply. A poor quality power supply may cause the system to lose the CMOS setup information.
- Check that the motherboard battery still supplies approximately 3VDC. If it does not, replace it.

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:

- CPU/BIOS support: Make sure that your CPU is supported and that you have the latest BIOS installed in your system.
- Memory: Make sure that the memory modules are supported. Refer to the product page on our website at www.supermicro.com. Test the modules using **memtest86** or a similar utility.
- Storage drives: Make sure that all drives work properly. Replace if necessary.

- System cooling: Check that all heatsink fans and system fans 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 Control panel Overheat LED.
- Adequate power supply: Make sure that the power supply provides adequate power to the system. Make sure that all power connectors are connected. Refer to the Supermicro website for the minimum power requirements.
- Proper software support: Make sure that the correct drivers are used.

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

- Source of installation: Make sure that the devices used for installation are working properly, including boot devices.
- Cable connection: Check to make sure that all cables are connected and working properly.
- Use 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.
- Identify a bad component by isolating it. Check and change one component at a time.
  - Remove a component in question from the chassis, and test it in isolation. Replace it if necessary.
  - Or swap in a new component for the suspect one.
  - Or install the possibly defective component into a known good system. If the new system works, the component is likely not the cause or the problem.

7.4 POST Codes

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

When BIOS performs the Power On Self Test, it writes checkpoint codes to I/O port 0080h. If the computer cannot complete the boot process, the POST codes can be viewed from the BMC using the Post Snooping function.

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

7.5 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.

Check the BMC Error Log

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

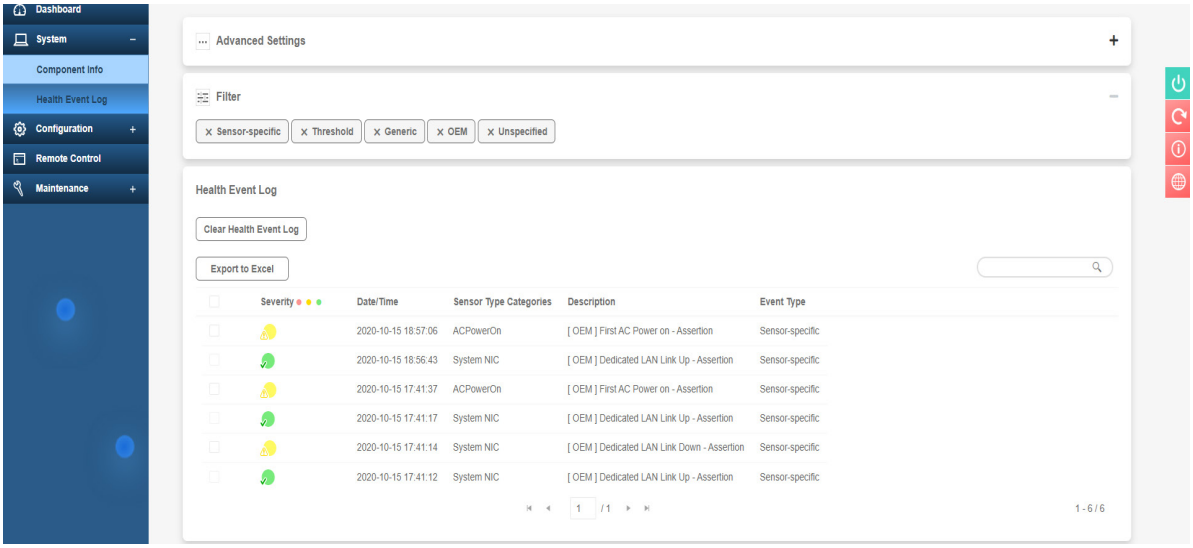


Figure 7-4. BMC Event Log

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

7.6 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/nfo/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 to download the BIOS package. Extract the BIOS binary image into a USB flash device and rename it "Super.ROM" for the BIOS recovery use.

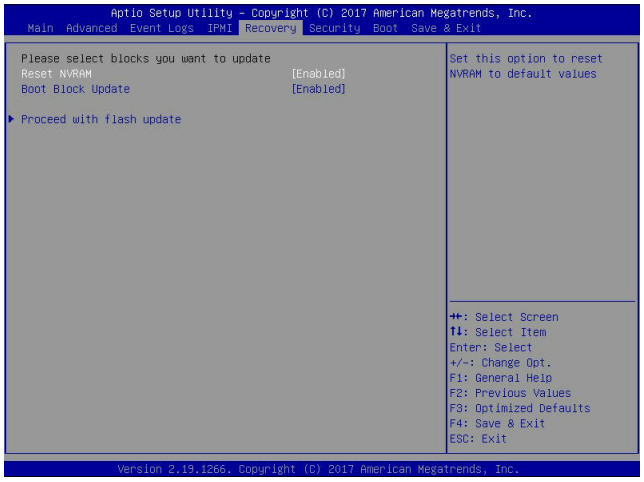
   Note 2: Before recovering the main BIOS image, confirm that the "Super.ROM" binary image file you download is the same version or a close version meant for your motherboard.

2. Insert the USB device that contains the new BIOS image ("Super.ROM") into your USB drive and reset the system when the following screen appears.

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



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

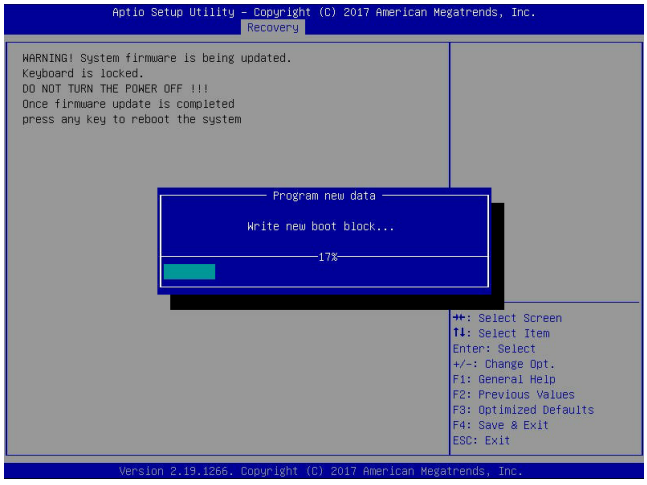


4. When the screen as shown above displays, use the arrow keys to select the item "Proceed with flash update" and press the <Enter> key. You will see the BIOS recovery progress as shown in the screen below.

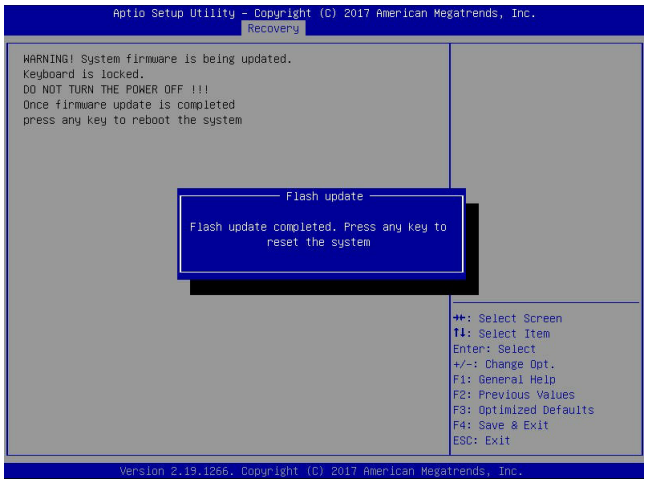
   Note: *Do not interrupt the BIOS flashing process until it has been completed*.

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

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

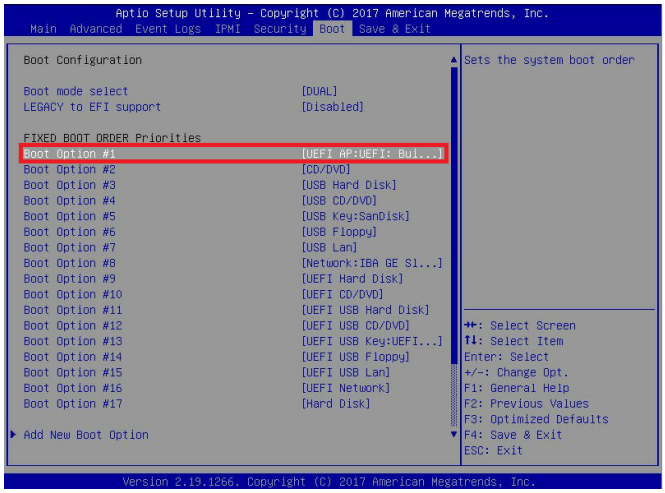


7. Press <Del> continuously during system boot to enter the BIOS Setup utility. From the top of the toolbar, select Boot to enter the submenu. From the submenu list, select Boot Option

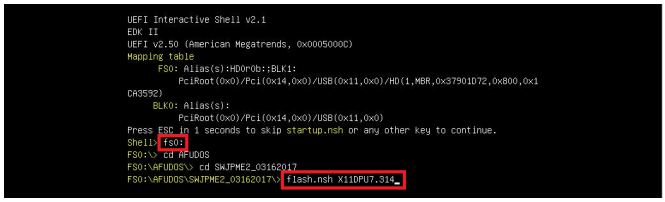


#1 as shown below. Then, set Boot Option #1 to [UEFI AP:UEFI: Built-in EFI Shell]. Press <F4> to save the settings and exit the BIOS Setup utility.

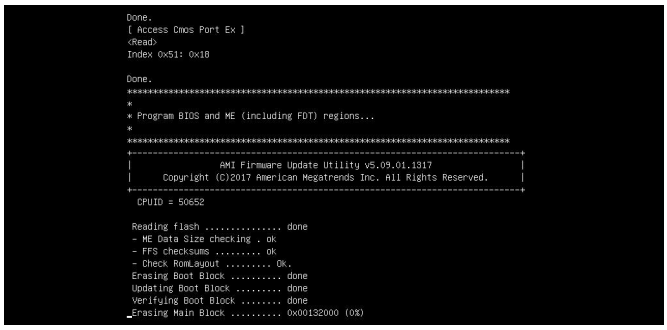
8. When the UEFI Shell prompt appears, type fs# to change the device directory path. Go to the directory that contains the BIOS package you extracted earlier from Step 6. Enter flash.nsh BIOSname.### at the prompt to start the BIOS update process.



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

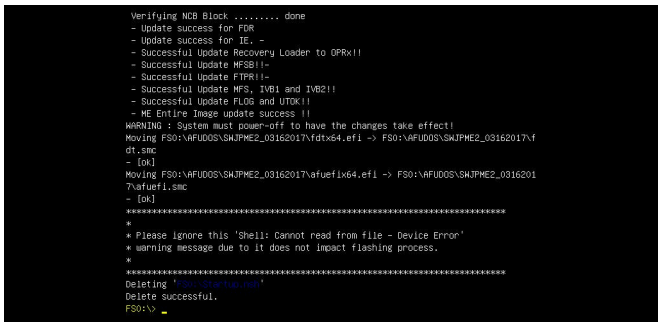


9. The screen above indicates that the BIOS update process is complete. When you see the screen above, unplug the AC power cable from the power supply, clear CMOS, and plug



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

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



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

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

7.7 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 completely.
2. Remove the chassis cover 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.



JBT1 contact pads

7.8 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.

7.9 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.

7.10 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 to provide feedback on our manuals.

7.11 Contacting Supermicro

Headquarters

Address:	Super Micro Computer, Inc. 980 Rock Ave. San Jose, CA 95131 U.S.A.
Tel:	+1 (408) 503-8000
Fax:	+1 (408) 503-8008
Email:	marketing@supermicro.com (General Information) support@supermicro.com (Technical Support)
Website:	www.supermicro.com

Europe

Address:	Super Micro Computer B.V. Het Sterrenbeeld 28, 5215 ML 's-Hertogenbosch, The Netherlands
Tel:	+31 (0) 73-6400390
Fax:	+31 (0) 73-6416525
Email:	sales@supermicro.nl (General Information) support@supermicro.nl (Technical Support) rma@supermicro.nl (Customer Support)
Website:	www.supermicro.nl

Asia-Pacific

Address:	Super Micro Computer, Inc. 3F, No. 150, Jian 1st Rd. Zhonghe Dist., New Taipei City 235 Taiwan (R.O.C)
Tel:	+886-(2) 8226-3990
Fax:	+886-(2) 8226-3992
Email:	support@supermicro.com.tw
Website:	www.supermicro.com.tw

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.

Warning Definition



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

警告の定義

この警告サインは危険を意味します。

人身事故につながる可能性がありますので、いずれの機器でも動作させる前に、

電気回路に含まれる危険性に注意して、標準的な事故防止策に精通して下さい。

此警告符号代表危险。

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

此警告符號代表危險。

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

Warnung

WICHTIGE SICHERHEITSHINWEISE

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

BEWAHREN SIE DIESE HINWEISE GUT AUF.

INSTRUCCIONES IMPORTANTES DE SEGURIDAD

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

GUARDE ESTAS INSTRUCCIONES.

IMPORTANTES INFORMATIONS DE SÉCURITÉ

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

CONSERVEZ CES INFORMATIONS.

תקנון הצהרות אזהרה

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

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

ا كً ف حالة وٌكي أى تتسبب ف اصابة جسد ةٌ هذا الزهز عٌ خطز !تحذ زٌ .
قبل أى تعول على أي هعذات،كي على علن بالوخاطز ال أٌجوة عي الذوائز
الكهزبائ ةٍ
وكي على درا ةٌ بالووارسات البقائ ةٍ لو عٌ وقع أي حادث
استخذم رقن الب إٍى الو صٌص ف هًا ةٌ كل تحذ زٌ للعشر تزجوتها

안전을 위한 주의사항

경고!

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

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

BELANGRIJKE VEILIGHEIDSINSTRUCTIES

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

BEWAAR DEZE INSTRUCTIES

Installation Instructions



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

設置手順書

システムを電源に接続する前に、設置手順書をお読み下さい。

警告

将此系统连接电源前,请先阅读安装说明。

警告

將系統與電源連接前，請先閱讀安裝說明。

Warnung

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

¡Advertencia!

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

Attention

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

יש לקרוא את הוראות התקנה לפני חיבור המערכת למקור מתח.

اقر إرشادات التركيب قبل توصيل النظام إلى مصدر للطاقة

시스템을 전원에 연결하기 전에 설치 안내를 읽어주십시오.

Waarschuwing

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

Circuit Breaker



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

サーキット・ブレーカー

この製品は、短絡（過電流）保護装置がある建物での設置を前提としています。

保護装置の定格が250 V、20 Aを超えないことを確認下さい。

警告

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

警告

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

Warnung

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

¡Advertencia!

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

Attention

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

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

هذا المنتج يعتمد على معداث الحمايت مه الدوائرالقصيرة التي تم تثبيتها في
المبنى
تأكد من أن تقييم الجهاز الوقائي ليس أكثر من : 20A, 250V

경고!

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

Waarschuwing

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

Power Disconnection Warning

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



電源切断の警告

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

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

警告

在你打开机箱并安装或移除内部器件前,必须将系统完全断电,并移除电源线。

警告

在您打開機殼安裝或移除內部元件前，必須將系統完全斷電，並移除電源線。

Warnung

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

¡Advertencia!

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

Attention

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

אזהרה מפני ניתוק חשמלי

!אזהרה

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

يجب فصم اننظاو من جميع مصادر انطاقت وإزانت سهك انكهرباء من وحدة امداد
انطاقت قبم
انصل إنى انمناطق انداخهيت نههيكم نتشبيج أو إزانت مكناث الجهاز

경고!

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

Waarschuwing

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

Equipment Installation



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

機器の設置

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

警告

只有经过培训且具有资格的人员才能进行此设备的安装、更换和维修。

警告

只有經過受訓且具資格人員才可安裝、更換與維修此設備。

Warnung

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

¡Advertencia!

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

Attention

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

אזהרה!

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

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

경고!

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

Waarschuwing

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

Restricted Area



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

アクセス制限区域

このユニットは、アクセス制限区域に設置されることを想定しています。

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

警告

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

警告

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

Warnung

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

¡Advertencia!

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

Attention

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

אזור עם גישה מוגבלת

אזהרה!

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

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

경고!

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

Waarschuwing

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

Battery Handling



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

電池の取り扱い

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

警告

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

警告

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

Warnung

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

Attention

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

¡Advertencia!

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

אזהרה!

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

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

경고!

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

Waarschuwing

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

Redundant Power Supplies



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

冗長電源装置

このユニットは複数の電源装置が接続されている場合があります。

ユニットの電源を切るためには、すべての接続を取り外さなければなりません。

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

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

Warnung

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

¡Advertencia!

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

Attention

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

אם קיים יותר מספק אחד

אזהרה!

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

قد يكون لهذا الجهاز عدة اتصالات بوحدات امداد الطاقة .

يجب إزالة كافة الاتصالات لعسل الوحدة عن الكهرباء

경고!

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

Waarschuwing

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

Backplane Voltage



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

バックプレーンの電圧

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

修理する際には注意ください。

警告

当系统正在进行时，背板上有很危险的电压或能量，进行维修时务必小心。

警告

當系統正在進行時，背板上有危險的電壓或能量，進行維修時務必小心。

Warnung

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

¡Advertencia!

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

Attention

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

מתח בפנל האחורי

אזהרה!

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

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

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

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

Comply with Local and National Electrical Codes



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

地方および国の電気規格に準拠
機器の取り付けはその地方および国の電気規格に準拠する必要があります。

警告
设备安装必须符合本地与本国电气法规。

警告
設備安裝必須符合本地與本國電氣法規。

Warnung
Die Installation der Geräte muss den Sicherheitsstandards entsprechen.

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

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

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

تركيب المعدات الكهربائية يجب أن يمتثل للقاويه المحلية والبطية المتعلقة
بالكهرباء

경고!
현 지역 및 국가의 전기 규정에 따라 장비를 설치해야 합니다.

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

Product Disposal



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

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

警告
本产品的废弃处理应根据所有国家的法律和规章进行。

警告
本產品的廢棄處理應根據所有國家的法律和規章進行。

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

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

Attention

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

סילוק המוצר

אזהרה!

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

التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقا لجميع القانين واللائح البطنية عند

경고!

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

Waarschuwing

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

Hot Swap Fan Warning



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

ファン・ホットスワップの警告

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

警告!

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

警告

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

Warnung

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

¡Advertencia!

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

Attention

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

אזהרה!

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

تحذير! أجزاء متحركة خطرة. ابتعد عن شفرات المروحة المتحركة.من الممكن أن
المراوح لا تزال تدورعند إزالة كتلة المروحة من الهيكل يجب إبقاء الأصابع
.ومفكات البراغي وغيرها من الأشياء بعيدا عن الفتحات في كتلة المروحة

경고!

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

Waarschuwing

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

Power Cable and AC Adapter



Warning! When installing the product, use the provided or designated connection cables, power cables and AC adaptors. Using any other cables and adaptors could cause a malfunction or a fire. Electrical Appliance and Material Safety Law prohibits the use of UL or CSA -certified cables (that have UL/CSA shown on the cord) for any other electrical devices than products designated by Supermicro only.

電源コードとACアダプター

製品を設置する場合、提供または指定および購入された接続ケーブル、電源コードとACアダプターを 該当する地域の条例や安全基準に適合するコードサイズやプラグと共に使用下さい。他のケーブルやアダプタを使用すると故障や火災の原因になることがあります。

電気用品安全法は、ULまたはCSA認定のケーブル(UL/CSAマークがコードに表記)を Supermicroが指定する製品以外に使用することを禁止しています。

警告

安装此产品时,请使用本身提供的或指定的或采购的连接线,电源线和电源适配器，包含遵照当地法规和安全要求的合规的电源线尺寸和插头.使用其它线材或适配器可能会引起故障或火灾。除了Supermicro所指定的产品,电气用品和材料安全法律规定禁止
使用未经UL或CSA认证的线材。(线材上会显示UL/CSA符号)。

警告

安裝此產品時,請使用本身提供的或指定的或採購的連接線,電源線和電源適配器，包含遵照當地法規和安全要求的合規的電源線尺寸和插頭.使用其它線材或適配器可能會引起故障或火災。除了Supermicro所指定的產品,電氣用品和材料安全法律規定禁止
使用未經UL或CSA認證的線材。 (線材上會顯示UL/CSA符號)。

Warnung

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

¡Advertencia!

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

Attention

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

AC ימאתמו סיילמשח סילבכ

!הרהזא

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

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

전원 케이블 및 AC 어댑터

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

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

Stroomkabel en AC-Adapter

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

Appendix B

System Specifications

Processors

Dual 3rd Generation Intel® Xeon® Scalable processors in LGA4189 socket; Supports CPU TDP up to 270W.
Note: Refer to the motherboard specifications pages on our website for updates to supported processors.

Chipset

Intel® C621A

BIOS

AMI 256Mb SPI Flash EEPROM

Memory

32 DIMM slots for up to 8TB 3DS ECC DDR4-3200:LRDIMM/RDIMM (total 8TB) or
32 DIMM slots for up to 4TB 3DS ECC DDR4-3200:LRDIMM/RDIMM plus 8TB Intel® Optane™ DCPMM (total 12TB)

Storage Drives

24 NVMe/SATA/SAS drive bays
Two M.2 NVMe or two M.2 SATA3 slots on the motherboard

PCI Expansion Slots

Eight PCIe 4.0 x16 FH, 10.5"L

Input/Output

One AIOM (slim) slot with optional configurations for up to two AIOM (slim) slots for
flexible networking (OCP 3.0 compatible)
One RJ45 dedicated BMC LAN port
Two USB 3.0 ports (rear)
One VGA port

Motherboard

X12DHM-6; Length 17.0", Width 10.7" (431.8 mm x 271.8 mm)

Chassis

CSE-HS219-R1K63P 2U Rackmount, 1.7 x 17.2 x 29.3in. / 43 x 437 x 746mm (HxWxD)

System Cooling

Four 8-cm heavy duty fans with optimal fan speed control
Two air shrouds

Power Supply

PWS-1K63A-1R 1600W redundant modules, 80Plus Titanium level
AC Input
  800W: 100-127Vac/50-60 Hz
  1200W: 200-240Vac/50-60 Hz
  1600W: 200-240Vac/50-60 Hz
+12V
  Max: 83A (100Vac-127Vac)
  Max: 166A (200Vac-240Vac)
12V SB
  Max: 2.1A / Min: 0A

Operating Environment

Operating Temperature: 10º to 35º C (50º to 95º F)
Non-operating Temperature: -40º to 60º C (-40º to 140º 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
BS/EN 55032
BS/EN 55035
BS/EN 61000-3-2
BS/EN 61000-3-3
BS/EN 61000-4-2
BS/EN 61000-4-3
BS/EN 61000-4-4
BS/EN 61000-4-5
BS/EN 61000-4-6
BS/EN 61000-4-8
BS/EN 61000-4-11

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

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

Warning! This product can expose you to chemicals including lead, known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

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”

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

VCCI ー A