SuperServer®

SYS-A22GA-NBRT

USER'S MANUAL

Revision 1.0a (MNL-2809)

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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 SYS-A22GA-NBRT server. Installation and maintenance should be performed by certified service technicians only.

Notes

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

- Supermicro product manuals: https://www.supermicro.com/support/manuals
- Product drivers and utilities: https://www.supermicro.com/wdl
- Product safety info: https://www.supermicro.com/about/policies/safety_information.cfm
- A secure data deletion tool designed to fully erase all data from storage devices can be found on our website: https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wdl/utility/Lot9_Secure_Data_Deletion_Utility
- Frequently Asked Questions: https://www.supermicro.com/FAQ/index.php
- If you still have questions after referring to our FAQs, contact our support team. Region-specific Technical Support email addresses can be found at: "Contacting Supermicro" on page 11
- If you have any feedback on Supermicro product manuals, contact our writing team at: Techwriterteam@supermicro.com

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

Conventions Used in the Manual

Special attention should be given to the following symbols for proper installation and to prevent damage done to the components or injury to yourself.

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

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

Important: Important information given to ensure proper server installation or to relay safety precautions.

Note: Additional information given to differentiate various models or to provide information for proper server setup.

Contents

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Chapter 1:

Introduction

This chapter provides a brief outline of the functions and features of the SYS-A22GA-NBRT system. It is based on the MBD-X14DBG-DAP motherboard and the CSE-GP1001TS chassis.

Overview

This chapter provides a brief outline of the functions and features of the SuperServer SYS-A22GA-NBRT. The following provides an overview of the specifications and capabilities.

System Overview	
Motherboard	MBD-X14DBG-DAP
Chassis	CSE-GP1001TS
Processor	Dual Intel® Xeon® 6900-series processors with P-cores (Socket BR LGA 7529), with six UPIs (24 GT/s maximum per UPI link) and a thermal design power of up to 500 W
Memory	24 DIMM slots that support ECC DDR5 memory with speeds of up to 6400 MT/s (1DPC), or MR DIMM DDR5 memory with speeds of up to 8800 MT/s (1DPC or 1 slot per channel). Memory speed/capacity support depends on the processors used in the system.
GPU	NVIDIA SXM: HGX B200 8-GPU
Drive Support	10 front hot-swap 2.5" PCIe 5.0 x4 NVMe drive bays Two M.2 PCIe 4.0 x4 NVMe slots (M-key 2280/22110)
Expansion Slots	Two PCIe 5.0 x16 FHHL slots 10 PCIe 5.0 x16 LP slots **Note:** Slot 1 is for PCIe 5.0 x16 (with 8x bandwidth). Slots 2–9 are for east-west backend NICs.
I/O Ports	Two USB 3.0 ports (front) One VGA port (front) Dual BMC RJ45 ports (rear) One dedicated IPMI port (rear) One TPM header
System Cooling	19 counter-rotating 80 x 80 x 38-mm fans Five 80-mm fans (front) 10 80-mm fans (rear) Four 60-mm internal fans
Power	Six 5250 W redundant (3+3) power supplies
Form Factor	10U rackmount; (WxHxD) (17.2" x 17.6" x 33.2") (438.8 x 449 x 843.28 mm)

Notes:

- A Quick Reference Guide can be found on the following page of the Supermicro website: https://www.supermicro.com/en/products/system/gpu/10u/sys-a22ga-nbrt
- The following safety models associated with the SYS-A22GA-NBRT have been certified as compliant with UL or CSA: GP1001-H52X14

1.1 System Features

The following views of the system display the main features. Refer to the System Specifications appendix of this manual for additional specifications.

Front View

The illustration below shows the features included on the front of the chassis.

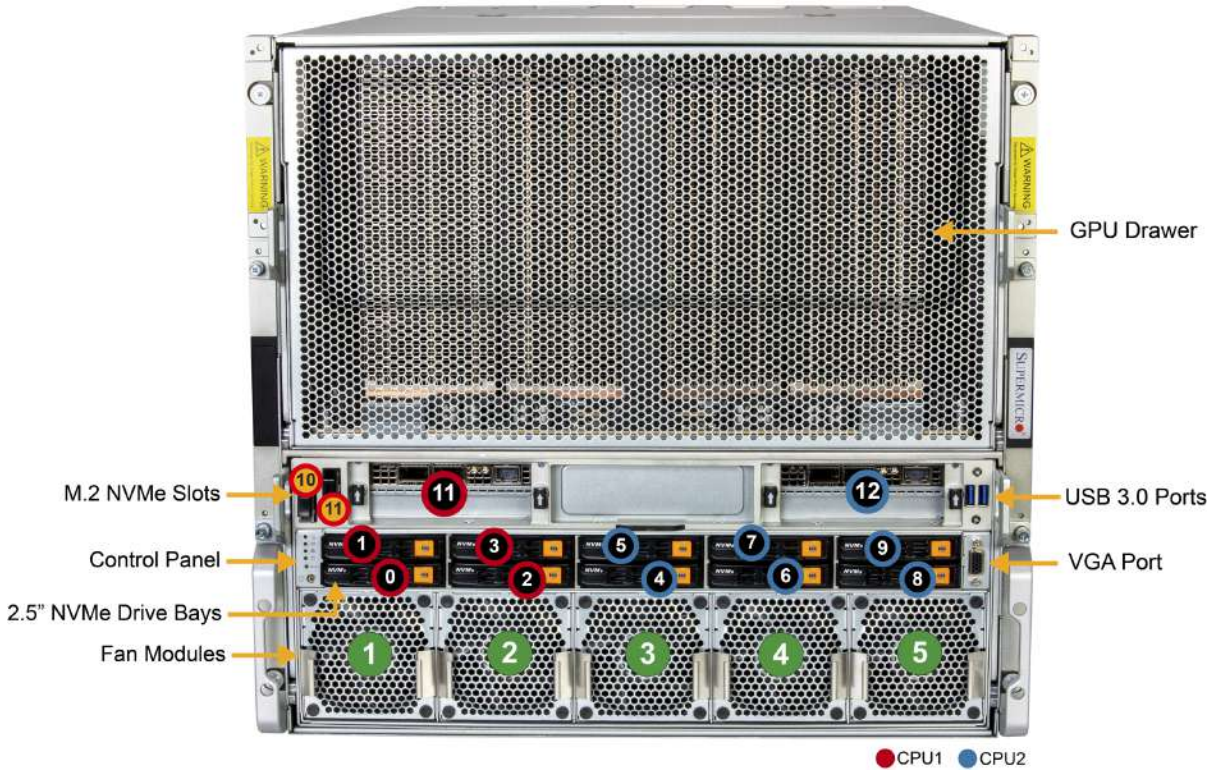


Figure 1-1. Front View

Chassis Features: Front	
Features	**Description**
GPU Drawer	One GPU drawer that houses the system's GPUs
M.2 NVMe Slots	Two serviceable M.2 storage slots
Control Panel	See "Control Panel" on page 1 for details
2.5" NVMe Drive Bays	10 hot-swap 2.5" external drive trays
Fan Modules	Five high-speed external system cooling fans
USB 3.0 Ports	Two USB 3.0 ports
VGA Port	One legacy VGA video port

Storage Drive Locations	
Location	**Slot Description**
0 to 9	Ten 2.5" NVMe drive bays
10, 11	Two serviceable M.2 NVMe slots

Expansion Card Locations	
Location	**Slot Description**
11, 12	PCIe 5.0 x16 FHHL from PLX switch (North-South)

Fan Locations	
Location	**Slot Description**
1–5	Five hot-swap fans. See "Fans" on page 83 for details.

Control Panel

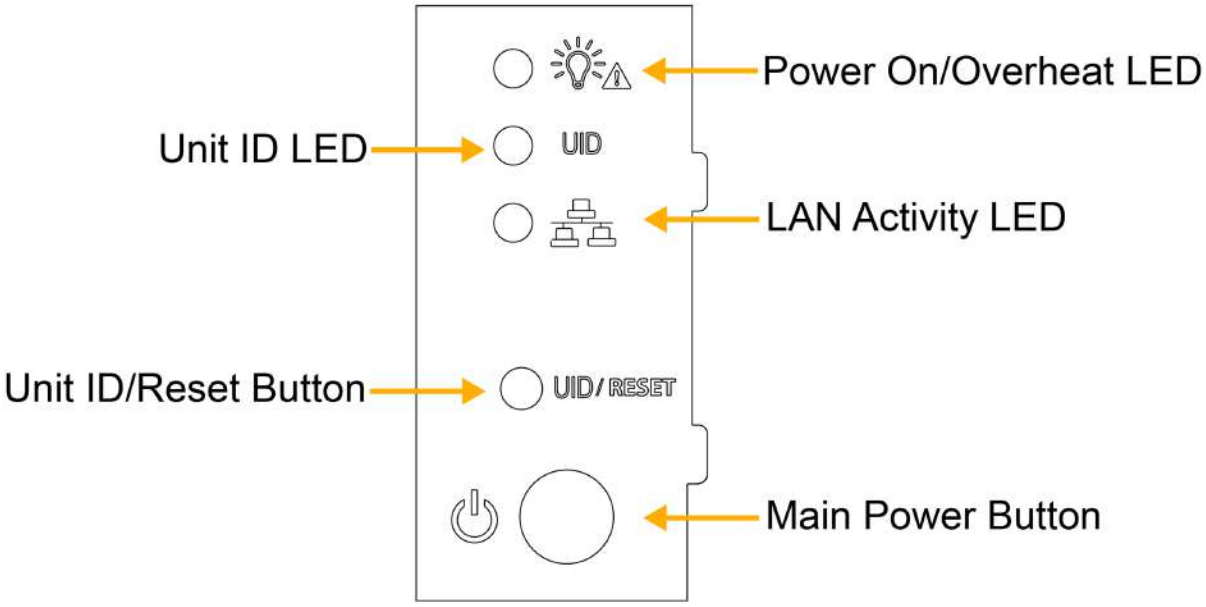


Figure 1-2. Control Panel

Chassis Features: Front	
Feature	**Description**
Power On/Overheat LED	The Power LED indicates that the power is on and the system is running. When blinking, this indicates that a system overheat event has been detected.
Unit ID (UID) LED	This LED is used to locate the server in large racks and server banks.
LAN Activity LED	This LED indicates network activity on the LAN when flashing.
Unit ID/Reset Button	This button, when pushed momentarily, turns on the Unit ID LED. If pushed and held down for 3 seconds, it will perform a hard reset on the system. All information not saved will be lost.
Main Power Button	This is the main power switch. Push this button to turn on the system.

Rear View

The features included on the chassis rear are shown below.

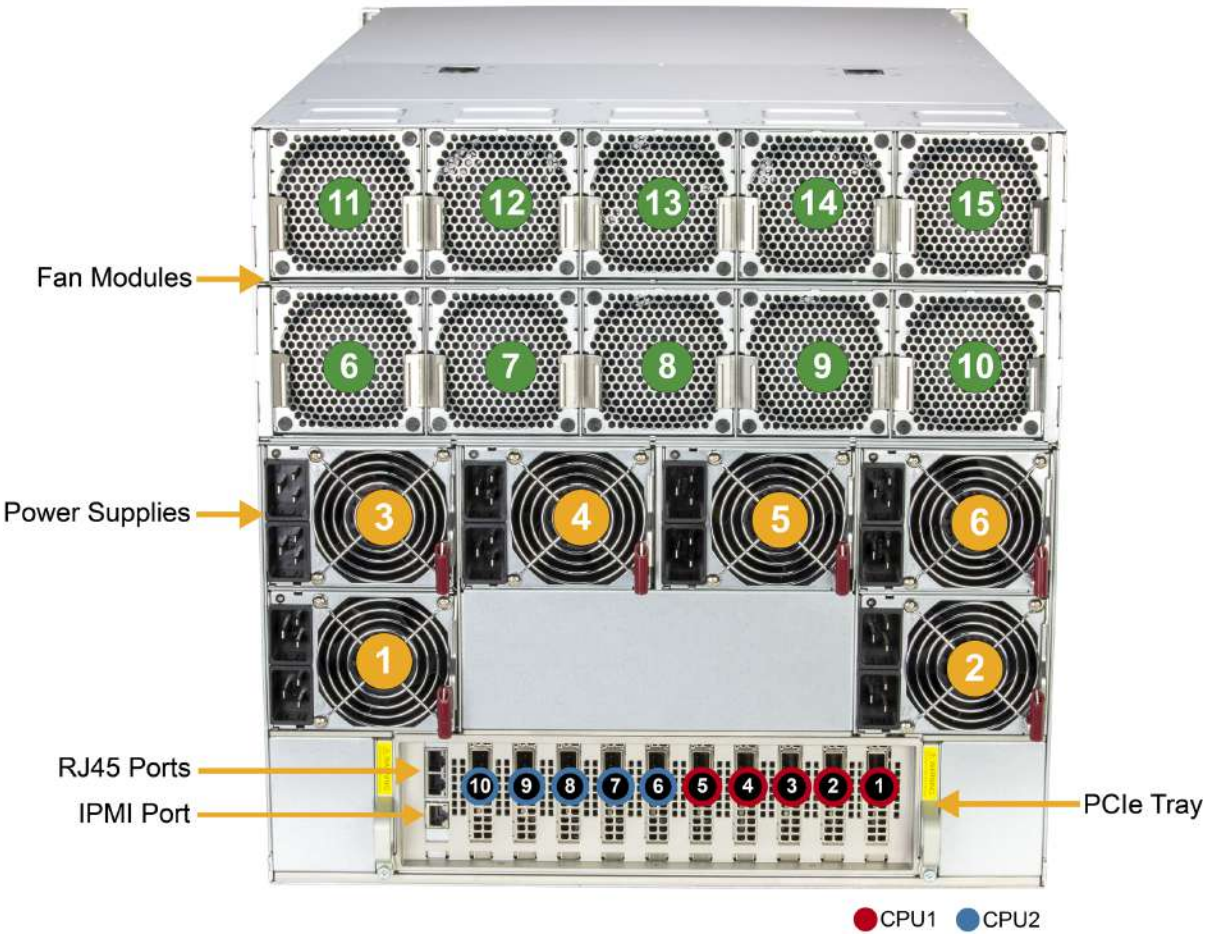


Figure 1-3. Rear View

Chassis Features: Rear	
Features	**Description**
Fan Modules	10 hot-swap fan modules
Power Supplies	Six redundant 5250 W Titanium Level power supplies
RJ45 Ports	Dual 10 GbE RJ45 Ports
IPMI Port	One dedicated IPMI port
PCIe Tray	Houses the LPIO options

Expansion Slot Locations	
Features	**Description**
2–9	PCIe 5.0 x16 LP from PLX switch linked to GPUs
1, 10	PCIe 5.0 x16 LP from PLX switch **Note:** Slot 1 is PCIe 5.0 x16 (with x8 bandwidth)

Fan Locations	
Features	**Description**
6–15	Ten hot-swap fan modules

Power Supply Locations	
Features	**Description**
1–6	Six 5250 W redundant (3 + 3) Titanium Level (96%) power supplies

1.2 System Architecture

This section covers the locations of the system's main components and provides a motherboard block diagram.

Main Components

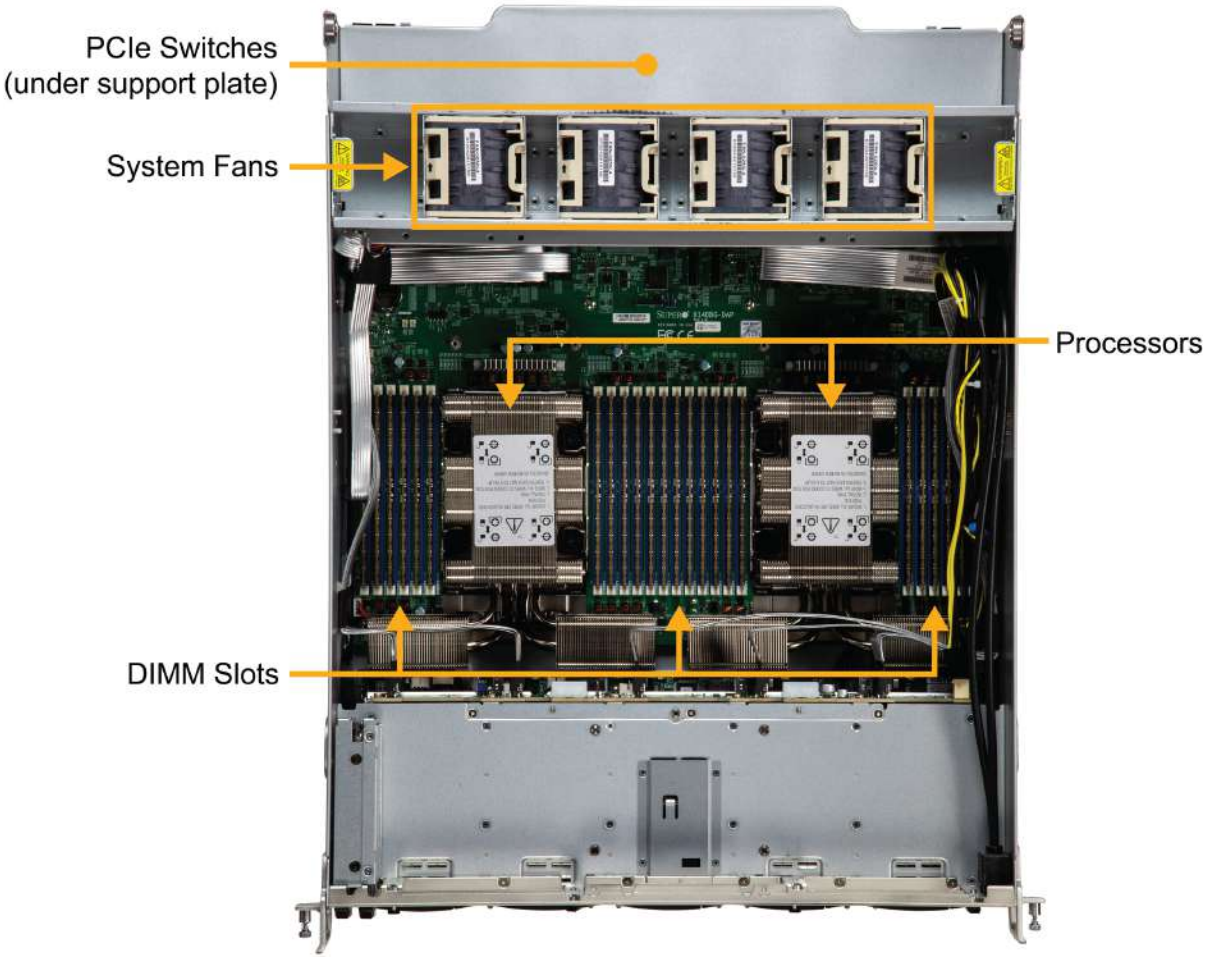
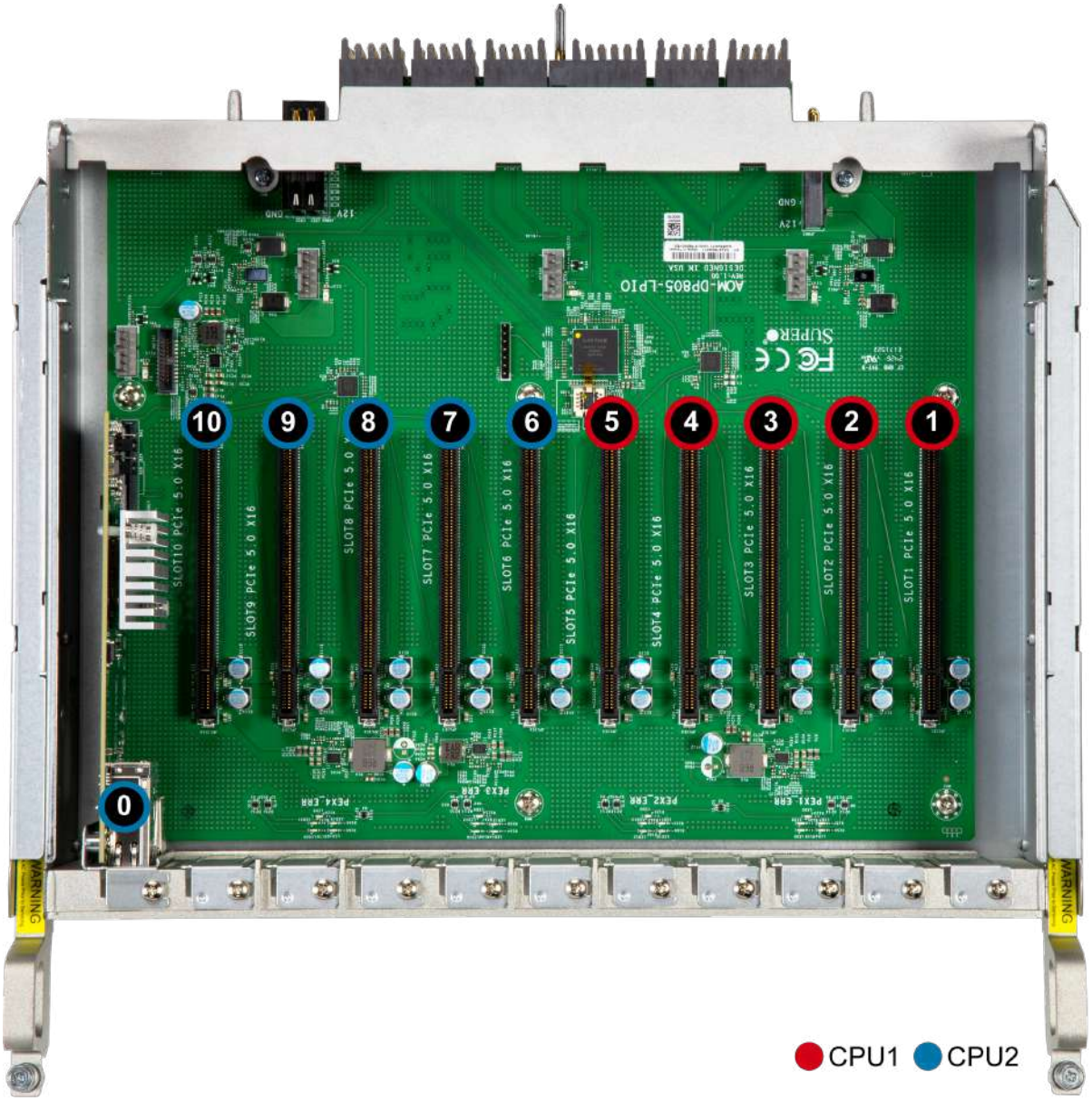


Figure 1-4. SYS-A22GA-NBRT Main Component Locations

System Features: Top	
Feature	**Description**
PCIe Switches (under support plate)	Four PCIe switches (covered)
System Fans	Four internal fans
Processors	Dual Intel® Xeon® 6900-series processors
DIMM Slots	24 DIMM slots



PCIe Tray Features: Top	
Feature	**Description**
0	One BMC/IPMI port Two 10G RJ45 ports
1–10	10 PCIe 5.0 x16 slots **Note:** Slot 1 is PCIe 5.0 x16 (with x8 bandwidth). Slots 2–9 are for East-West backend NICs.

System Block Diagram

The following block diagram displays the connections and relationships between the subsystems and major components of the SYS-A22GA-NBRT server.

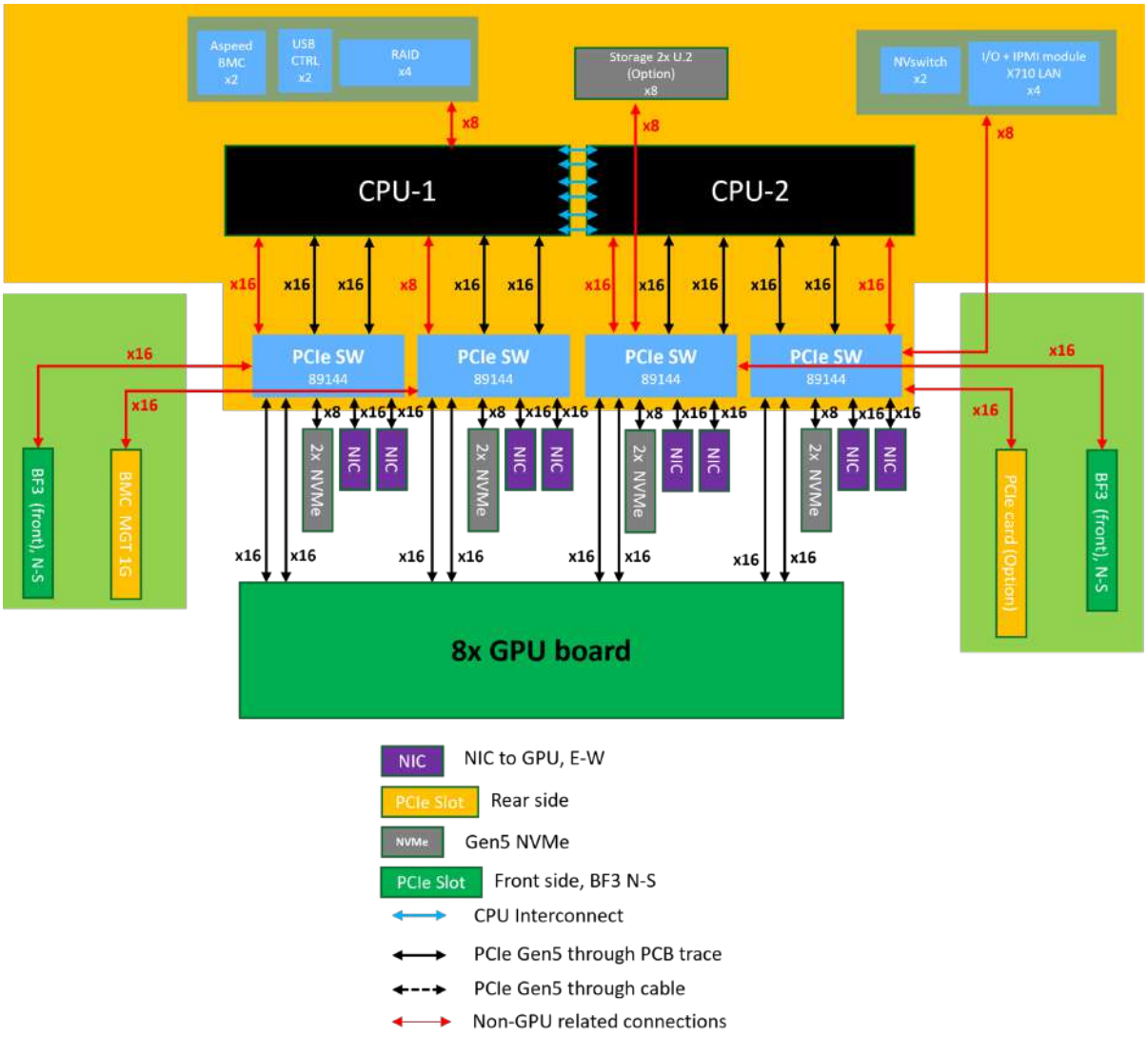


Figure 1-5. SYS-A22GA-NBRT System Block Diagram

Motherboard Block Diagram

The following block diagram displays the connections and relationships between the subsystems and major components of the MBD-X14DBG-DAP motherboard.

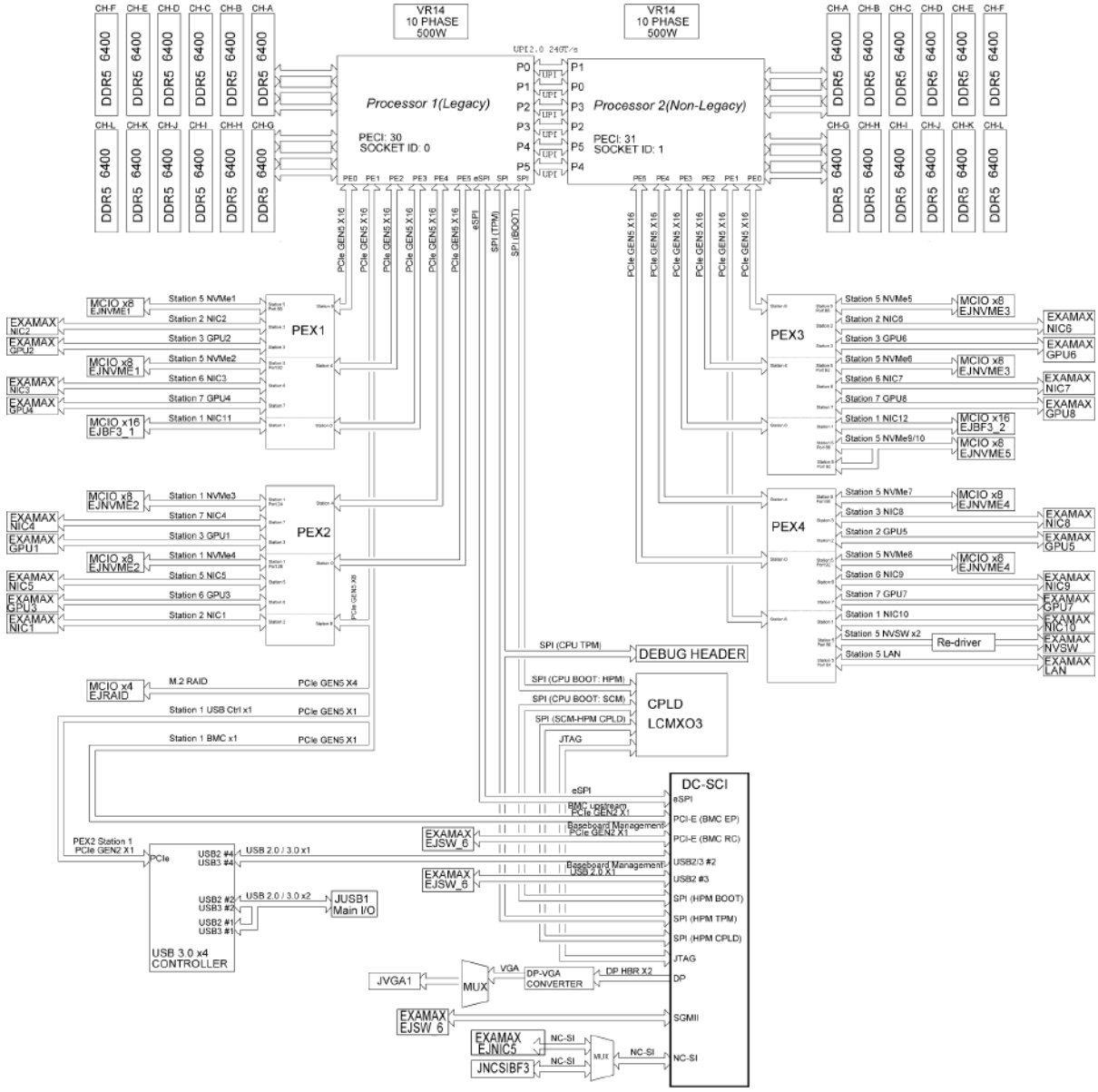


Figure 1-6. MBD-X14DBG-DAP Motherboard Block Diagram

1.3 Motherboard Quick Reference

For details on the MBD-X14DBG-DAP motherboard layout and other quick reference information, refer to the content below.

Motherboard Layout

This chapter provides detailed information on the components installed on the MBD-X14DBG-DAP motherboard, as well as the features supported by the Big Twin server.

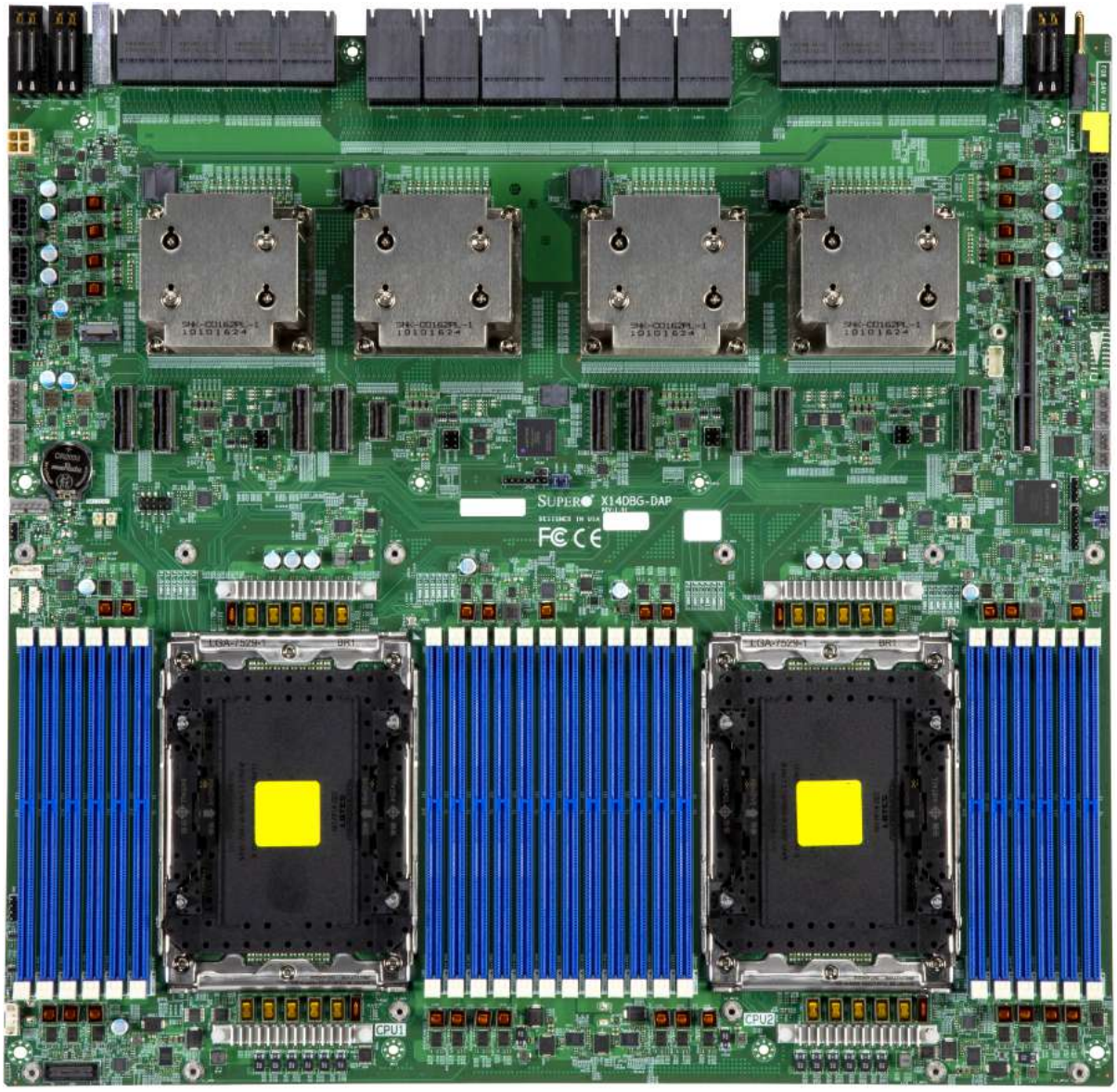


Figure 1-7. MBD-X14DBG-DAP Motherboard Image

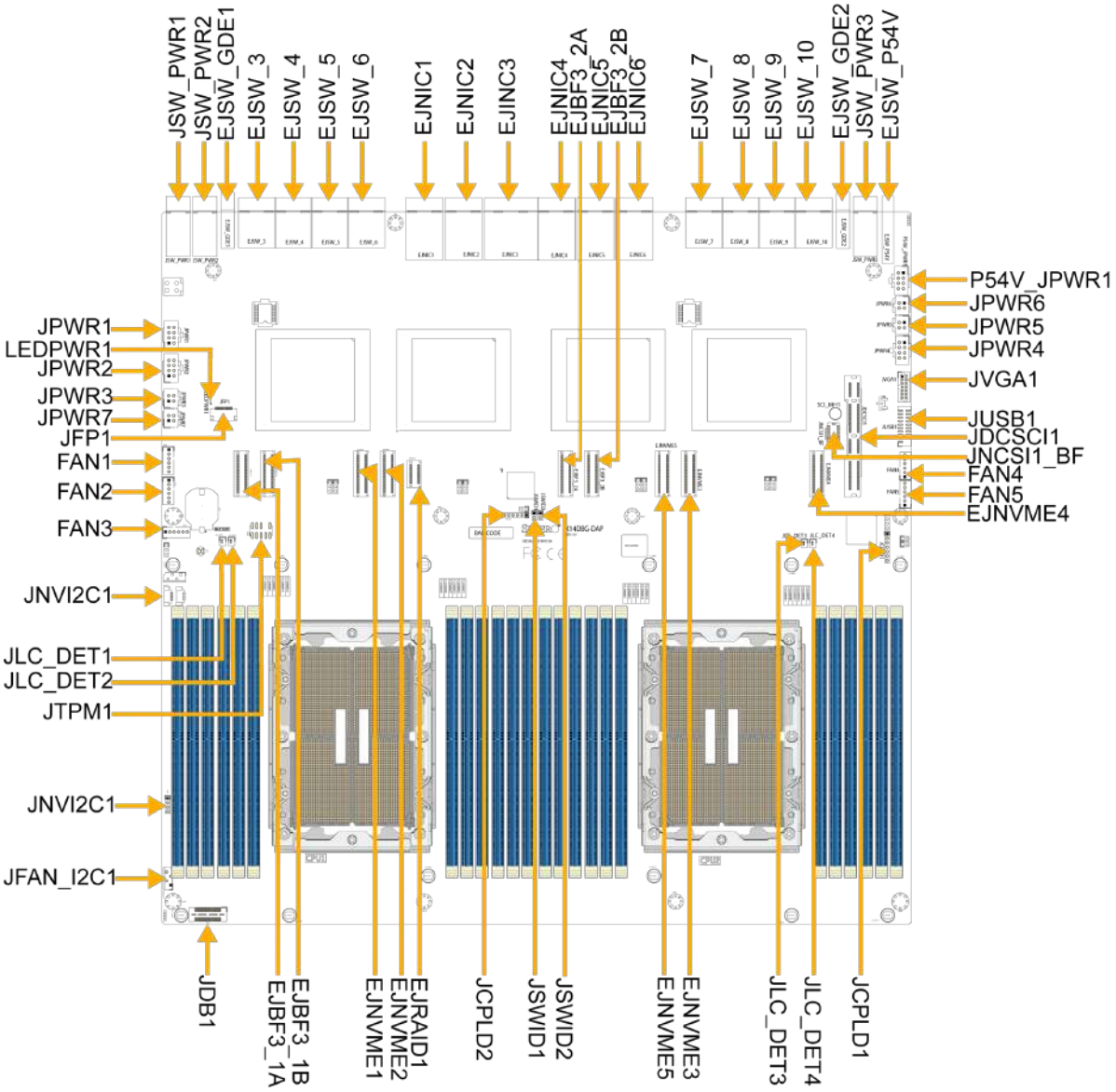


Figure 1-8. MBD-X14DBG-DAP Motherboard Layout

Notes:

- For detailed information on jumpers, connectors, and LED indicators, see "Maintenance and Component Installation" on page 40.
- "■" indicates the location of pin 1.
- "MH" indicates the location of a mounting hole.
- Components not documented are for internal testing purposes only.
- Use only the correct type of onboard CMOS battery as specified by the manufacturer. To avoid possible explosion, do not install the onboard battery upside down.

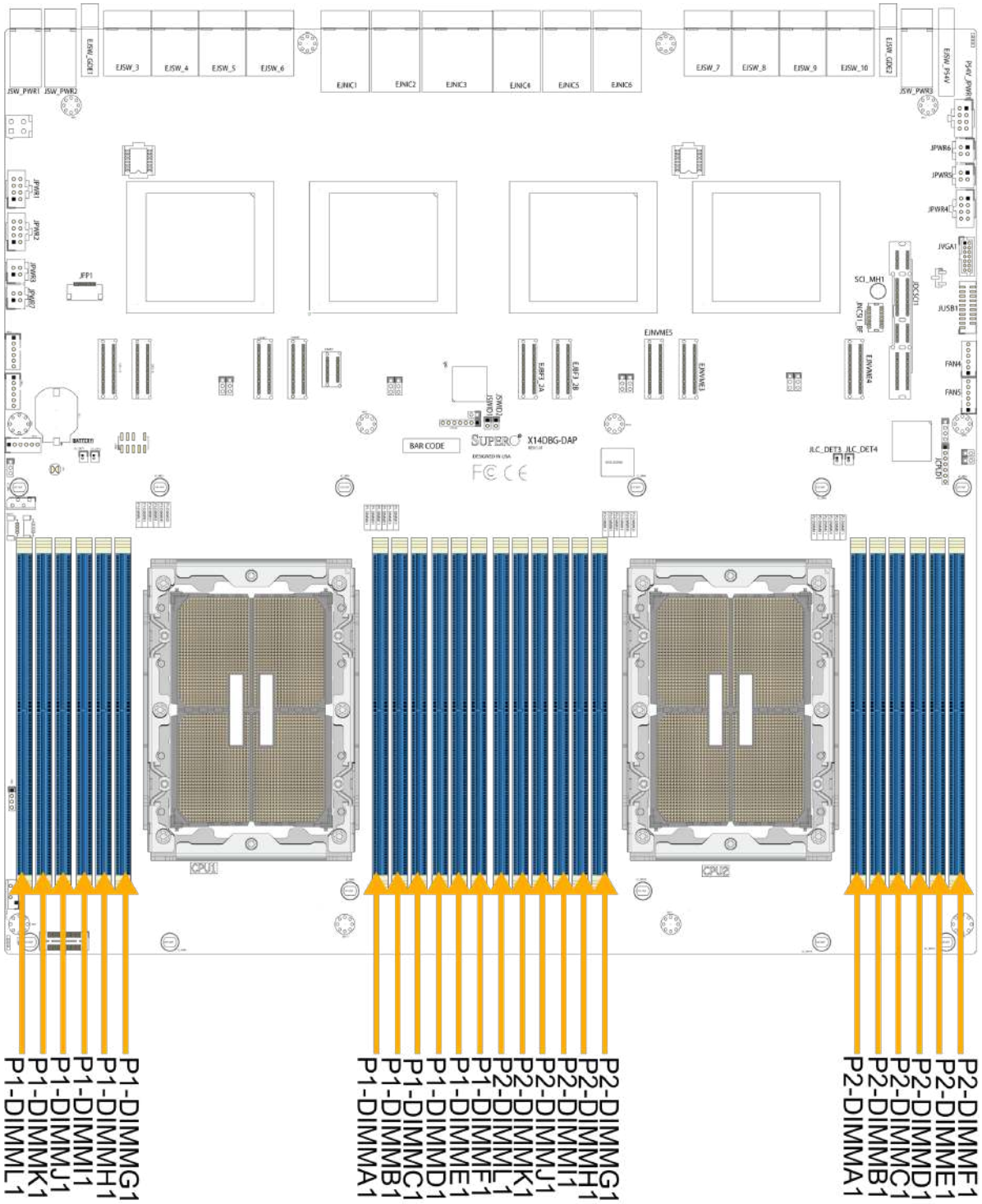


Figure 1-9. MBD-X14DBG-DAP DIMM Slots

Note: All P1 DIMM slots are supported by CPU1. All P2 DIMM slots are supported by CPU2.

Quick Reference Table

Jumper	Description	Jumper Settings
JBT1	CMOS Clear	Open (normal)

LED	Description	Status
LEDPWR1	Power LED	LED On: Onboard Power On

Connector	Description
BT1	Onboard Battery
EJBF3_1A, EJBF3_1B, EJBF3_2A, EJBF3_2B	Connections to Riser MCIO A/B
EJNIC1–EJNIC6	Internal Connections
EJNVME1–EJNVME5	Connections to backplane MCIO1-MCIO5
EJRAID1	Connection to M.2 AOM
EJSW_3–EJSW_10	Internal Connections
EJSW_GDE1–EJSW_GDE2	Internal Connections
EJSW_P54V	Internal Connection
FAN1–FAN5	System Fan Power Connectors
JCPLD1–JCPLD2	CPLD Headers
JDCSCI1	Connection to Fan AOM-SCM-DAP
JFAN_I2C1	Fan Board Connection
JFP1	Front Panel Header
JIPMB1	System Management Bus Header
JIPMB2	PMBUS Header to Fan Board
JLC_DET1–JLC_DET4	Liquid Leakage Detection Sensor Headers
JNCSI1_BF	Network Controller Sideband Interface Header for Bluefield 3
JNVI2C1	VPP Header for NVMe devices
JPDB1	Connection for Communication to PDB CPLD
JPGW1–JPGW10	CEM5 GPU Power Connectors
P54V_JPWR1	Fan Board +54 V Connection
JPWR1–JPWR7	+12 V Connections to Backplane and Riser Cards
JSW_PWR1–JSW_PWR3	Main Power Connections from Midplane to Motherboard
JTPM1	Trusted Platform Module/Port 80 Connector

Connector	Description
JUSB	USB Header
JVGA	VGA Connection

Chapter 2:

Server Installation

This chapter provides advice and instructions for mounting your server in a server rack. If your server is not already fully integrated with processors, system memory, etc., refer to "Maintenance and Component Installation" on page 40 for details on installing those specific components.

Important: Electrostatic Discharge (ESD) can damage electronic components. To prevent such damage to printed circuit boards (PCBs), it is important to use a grounded wrist strap, handle all PCBs by their edges, and keep PCBs in anti-static bags when not in use.

2.1 Unpacking the System

Inspect the box the SYS-A22GA-NBRT server was shipped in and note if it was damaged in any way. If any equipment appears damaged, file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the server. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. It will also require a grounded AC power outlet nearby. Be sure to read the precautions and considerations noted in "Standardized Warning Statements for AC Systems" on page 176.

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

2.2 Preparing for Setup

The box in which the SYS-A22GA-NBRT server was shipped should include the rackmount hardware needed to install it into the rack. Read this section in its entirety before you begin the installation.

Choosing a Setup Location

- The server 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.

System Precautions

- Review the electrical and general safety precautions in "Standardized Warning Statements for AC Systems" on page 176.
- 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

Warning! Stability hazard. The rack may tip over causing serious personal injury. Before extending the rack to the installation position, read the installation instructions. Do not put any load on the slide-rail mounted equipment in the installation position. Do not leave the slide-rail mounted equipment in the installation position.

Avertissement!
Danger d'instabilité. Le rack peut basculer et provoquer des blessures corporelles graves.
Avant d'étendre le rack en position d'installation, lire les instructions d'installation. Ne pas charger l'équipement monté sur rail de glissière en position d'installation. Ne pas laisser l'équipement monté sur rail de glissière en position d'installation.

Important: 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:

- If this unit is the only unit in the rack, it should be mounted at the bottom of the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top, placing the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
- Slide rail mounted equipment is not to be used as a shelf or a workspace.
- Do not pick up the server with the front handles. They are designed to pull the system from a rack only.

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.).

2.3 Installing the Rails

This section provides information on installing the CSE-GP1001TS chassis into a rack unit with the rails provided. There are a variety of rack units on the market, which may mean that the assembly procedure will differ slightly from the instructions provided. You should also refer to the installation instructions that came with the rack unit you are using.

Note: This rail will fit a rack between 28" and 33.5" deep.

Identifying the Rails

The CSE-GP1001TS chassis package includes two rail assemblies. Each assembly consists of two sections: a front section which secures to the front post of the rack, and a rear section which adjusts in length and secures to the rear post of the rack. These assemblies are specifically designed for the left and right side of the chassis and labeled.

Important: The rails secure the server to the rack and are not intended to be sliding rails.

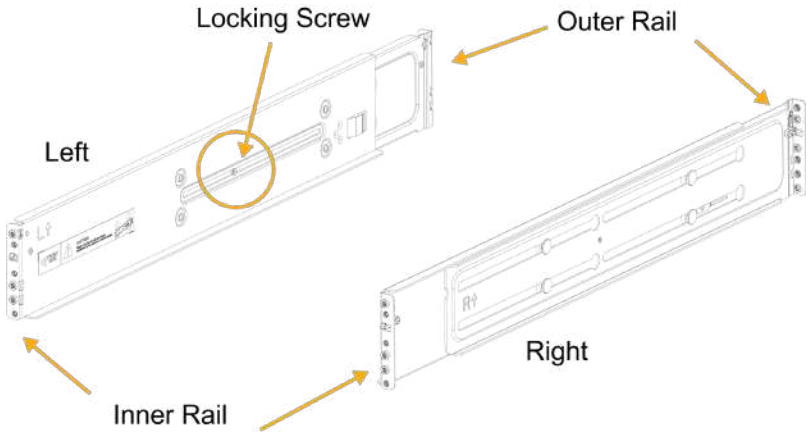


Figure 2-1. Identifying the Left and Right Rails

Installing the Rails onto the Rack

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

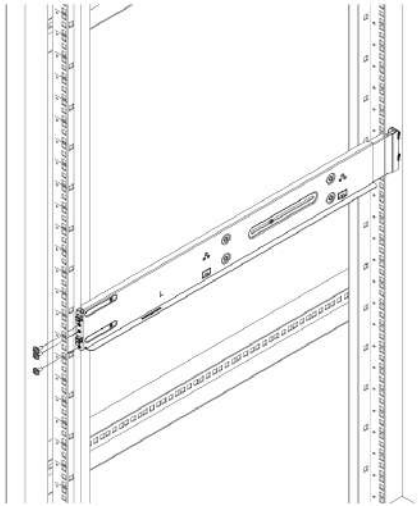


Figure 2-2. Attaching the Rail Front to the Rack (Left Rail Assembly Shown)

Note: Images displayed are for illustrative purposes only. The components installed in your system may or may not look exactly the same as the graphics shown in the manual.

2.4 Installing the Chassis into a Rack

Once rails are attached to the chassis and the rack, the chassis is ready to be installed into a rack.

1. Align the empty chassis enclosure with the outer rail and push it into the extension outer rail, as illustrated below.
2. Once the chassis is mounted in the outer rail, it can be pushed all the way into the rack.

Important: This figure is for illustrative purposes only. Always install servers to the bottom of a rack first.

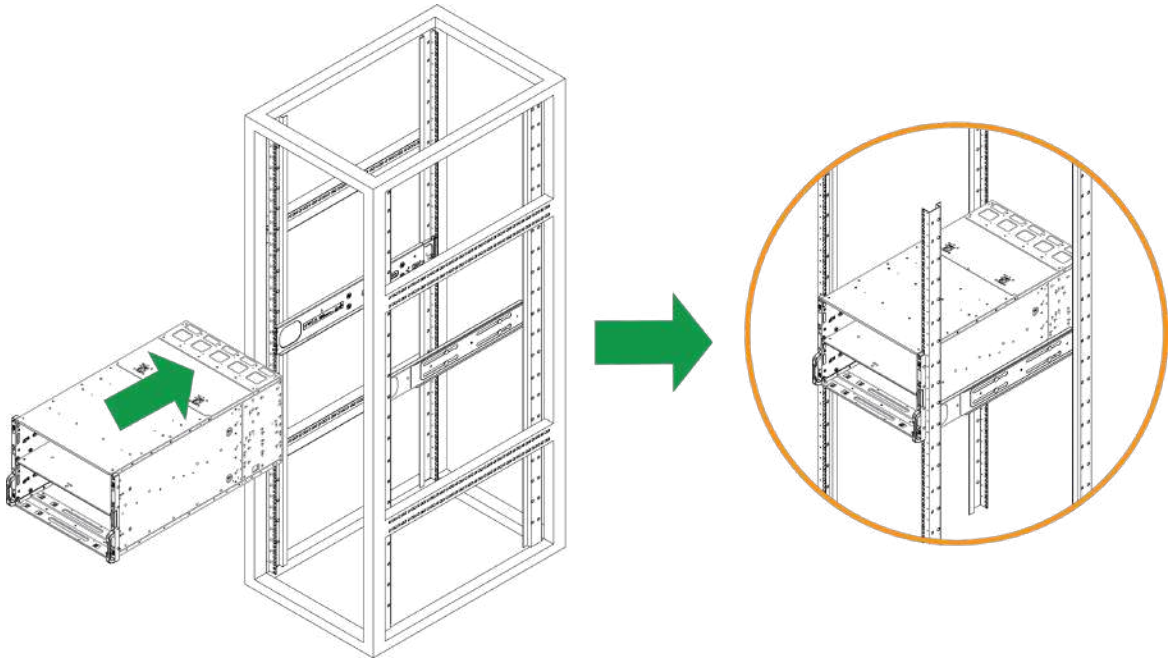


Figure 2-3. Installing the Enclosure into the Rack

3. After you've secured the main chassis to the rack, mount each drawer one at a time. Push each drawer to the back of the chassis and secure the drawer with two flathead screws to prevent them from sliding out.

Important: This figure is for illustrative purposes only. Always install servers to the bottom of a rack first.

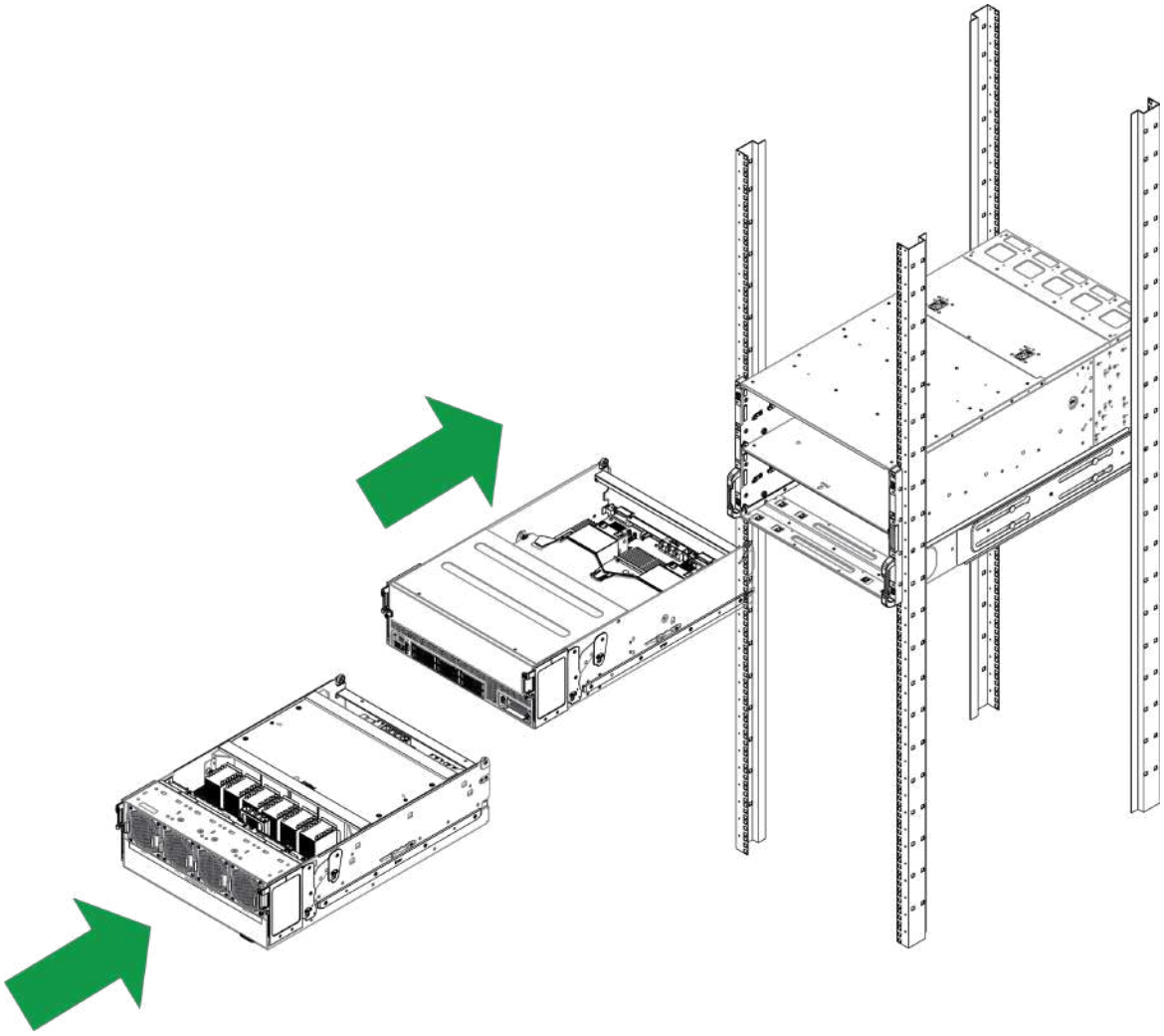


Figure 2-4. Installing the CPU and GPU Drawers into the Enclosure

Note: Images displayed are for illustrative purposes only. The components installed in your system may or may not look exactly the same as the graphics shown in the manual.

Removing the Chassis

The process of removing the chassis from the rack is basically the reverse of the installation procedure.

Important: Use caution when mounting or removing the system from the rack. For large systems, at least one other person must assist during installation or removal. Follow the safety recommendations printed on the rails. Depending on the size of the system, you might need to use a lift.

1. Begin by removing the power to your system. See the "Removing Power" for more information.
2. Remove all cables connected to the system and all screws from the GPU and CPU drawer handles.
3. Pull the GPU and CPU drawers out one at a time until all the remaining drawers are removed.

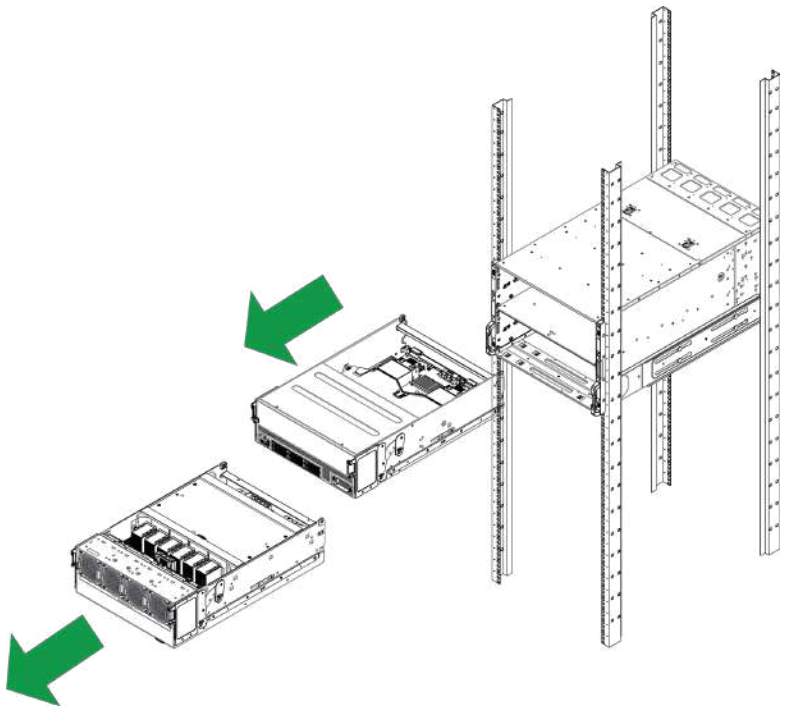


Figure 2-5. Removing the GPU and CPU Drawers

4. Remove the chassis as illustrated below.

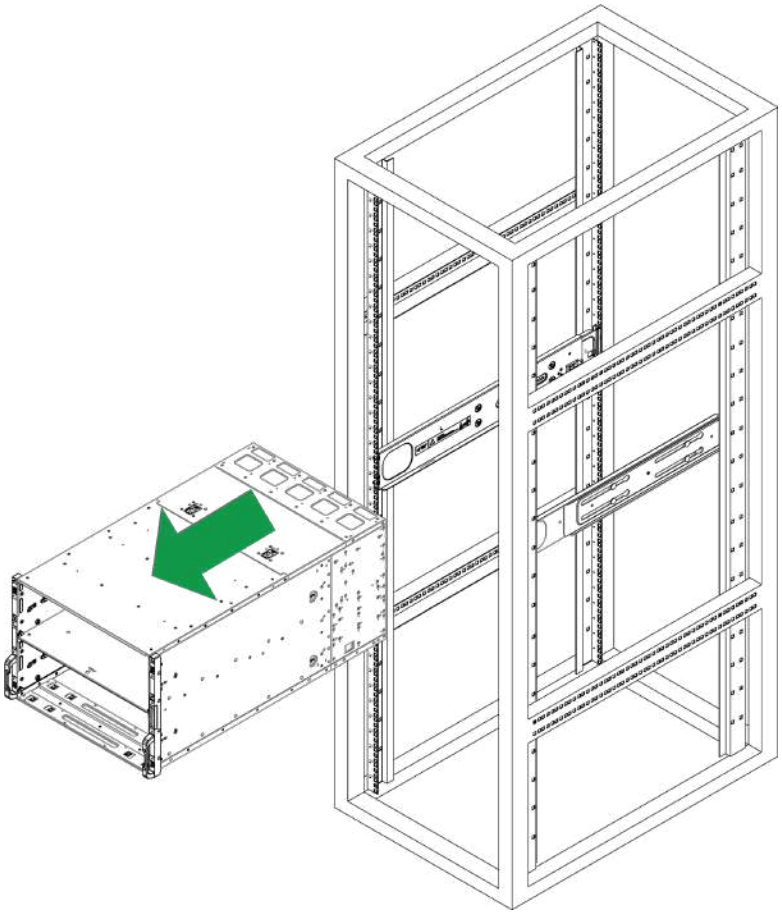


Figure 2-6. Unmounting the Chassis from the Rack

Chapter 3:

Maintenance and Component Installation

This chapter provides instructions on installing and replacing main system components for the SYS-A22GA-NBRT server. To prevent compatibility issues, only use components that match the specifications and/or part numbers given.

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

3.1 Removing Power

Use the following procedure to ensure that power has been removed from the SYS-A22GA-NBRT server. This step is necessary before servicing GPU trays, CPU trays, or network I/O trays.

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

3.2 Accessing the System

The SYS-A22GA-NBRT server features a removable top cover, which allows easy access to the inside of the server.

Important: 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.

Removing the GPU Drawer Cover

You can access the GPU drawer by removing its cover. This GPU drawer has handles to help with carrying the unit safely. To use the GPU drawer, pull out handles.

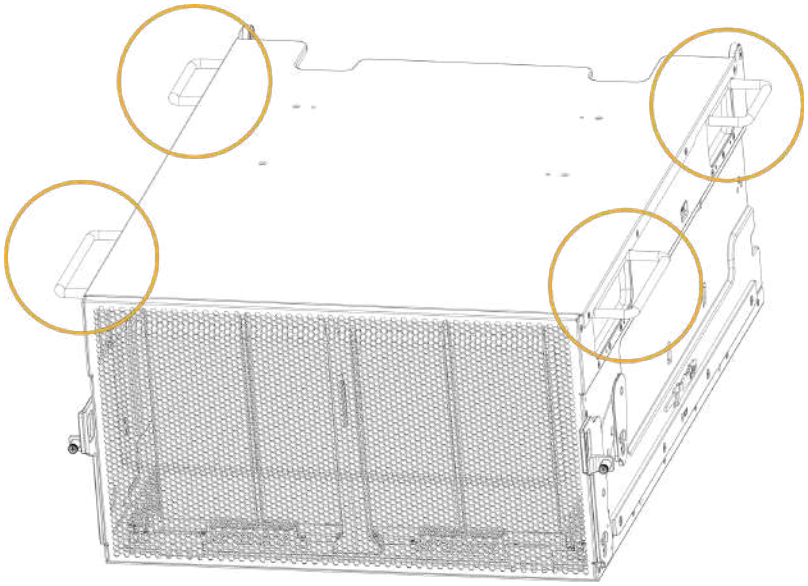


Figure 3-1. GPU Drawer Handles

1. First, remove the drawer from the chassis and remove the screws securing the cover to the GPU drawer.
2. Slide the cover toward the rear of the chassis.
3. Lift the top cover off of the chassis.

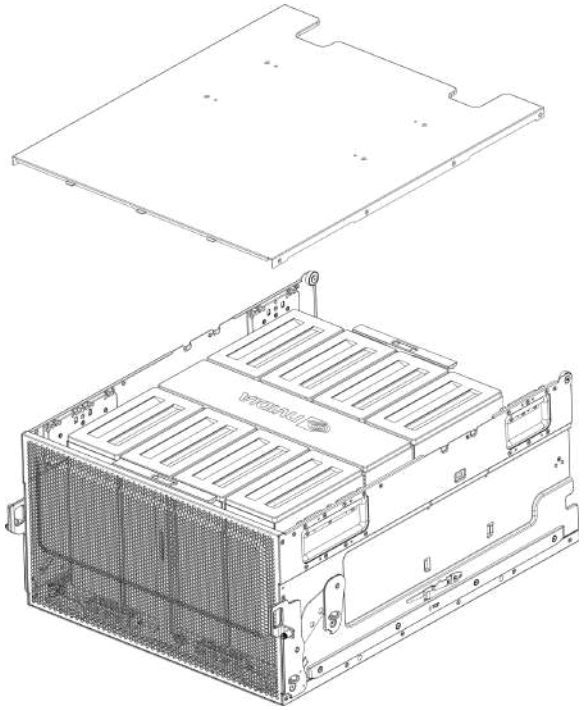


Figure 3-2. Removing the GPU Drawer Cover

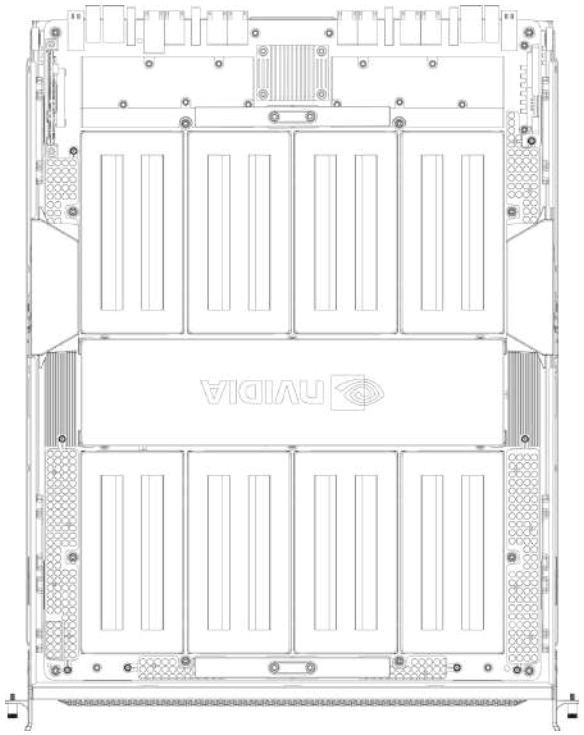


Figure 3-3. GPU Drawer Top View

Removing the CPU Drawer

The CPU drawer houses the system's motherboard, CPU, and related components. The CPU drawer may be removed from the chassis for maintenance.

1. There are two levers, one located directly on the left and right side of the CPU drawer. Pull these two levers down.

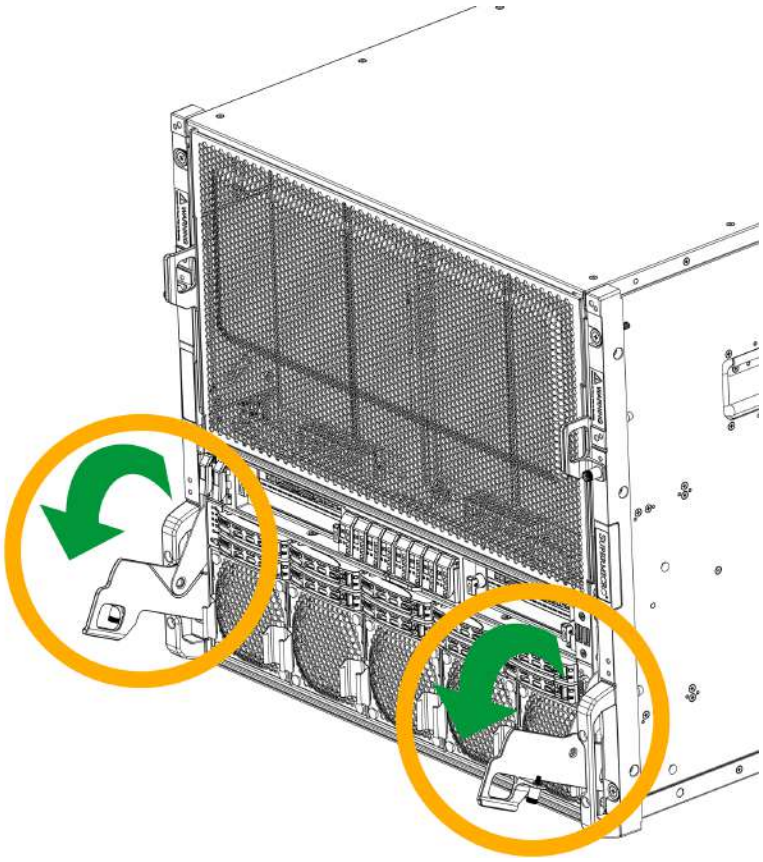


Figure 3-4. CPU Drawer Levers

2. Use these levers to pull the drawer out from the chassis.

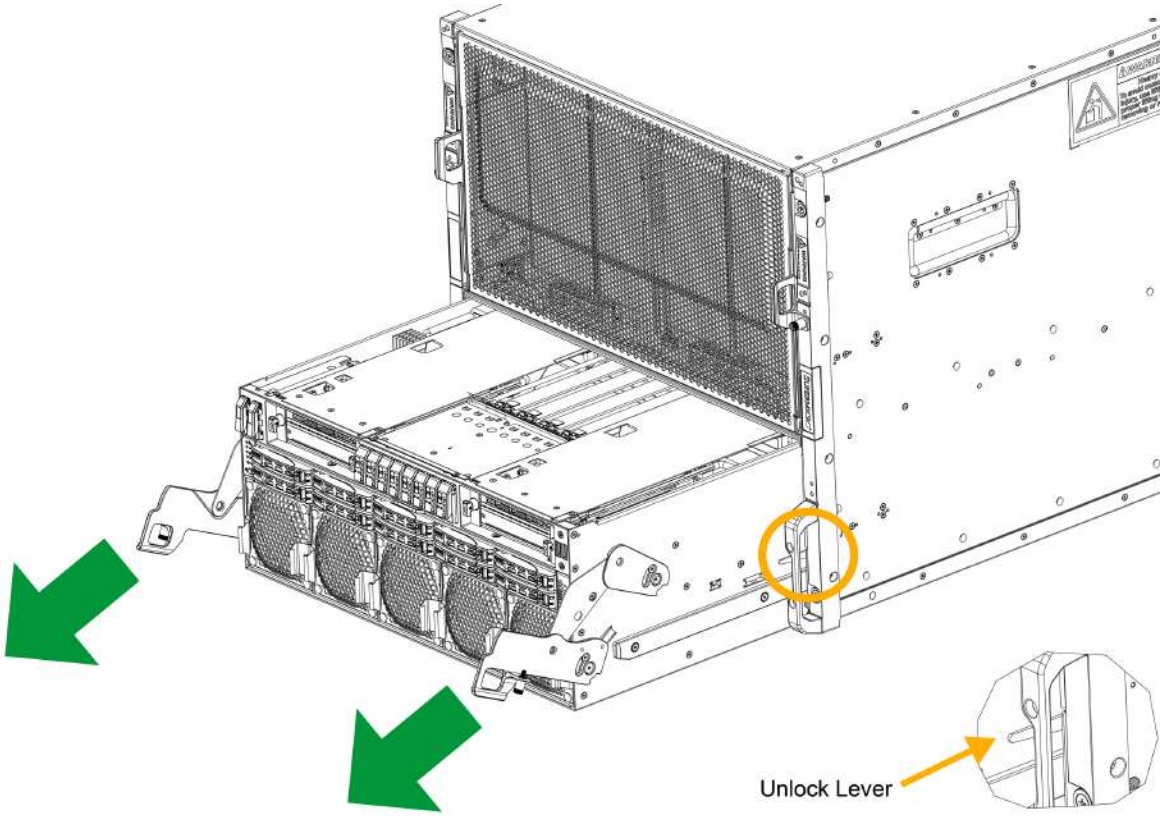


Figure 3-5. Removing the CPU Drawer

Removing the LPIO Drawer

The LPIO drawer supports low-profile PCIe slots. The LPIO drawer may be removed from the chassis for maintenance.

1. Begin by removing the system power. See "Removing Power" for more information.
2. Locate the locking levers; there is one lever on the left and right side of the LPIO drawer. Pull these levers outward at the same time to unlock the drawer from the chassis.
3. Use these levers to pull the drawer out from the chassis.

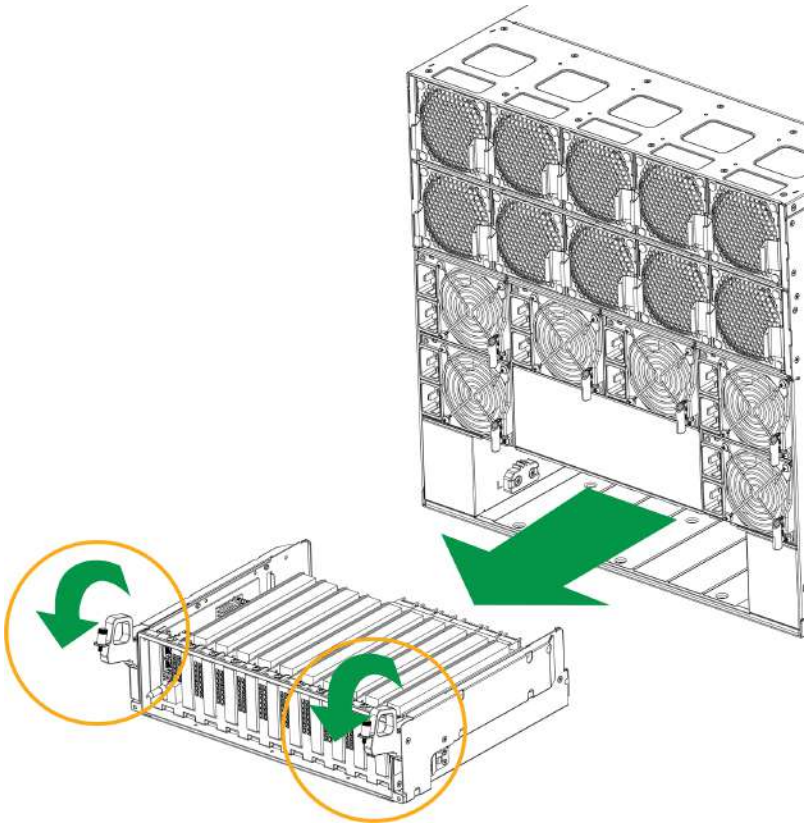


Figure 3-6. Removing the LPIO Drawer

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 your equipment from ESD.

Precautions

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

3.4 Processor and Heatsink Installation

This section provides procedures to install the processor(s) and heatsink(s).

Notes:

- Take industry standard precautions to avoid ESD damage. For details, see "Static-Sensitive Devices" on the previous page.
- Before starting, make sure that the plastic socket cap is in place and none of the socket pins are bent. If any damage is noted, contact your retailer.
- Do not connect the system power cord before the processor and heatsink installation is complete.
- 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 processor socket.
- When buying a processor separately, use only a Supermicro certified heatsink.
- Refer to the Supermicro website for the most recent processor support.
- When installing the heatsink, ensure a torque driver set to the correct force is used for each screw.
- Thermal grease is pre-applied on a new heatsink. No additional thermal grease is needed.

LGA-7529 Processors

Processor Top View

Figure 3-7. Processor

Overview of the Processor Carrier

This section displays the MBD-X14DBG-DAP motherboard processor carrier.

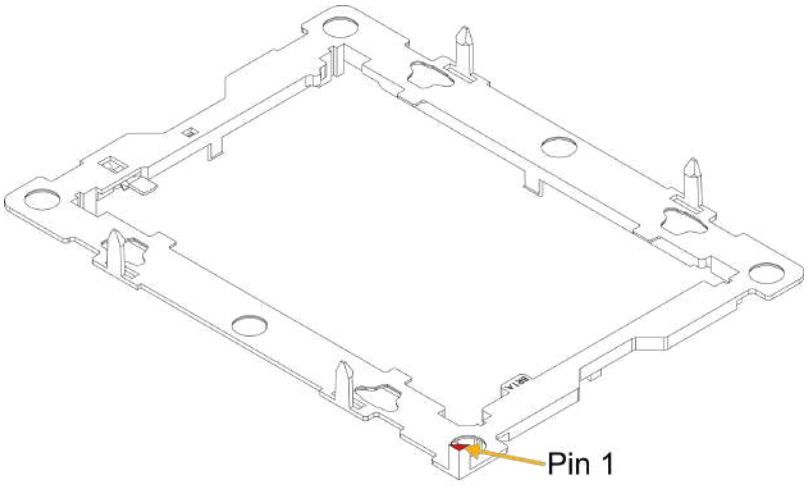


Figure 3-8. Carrier BR1A

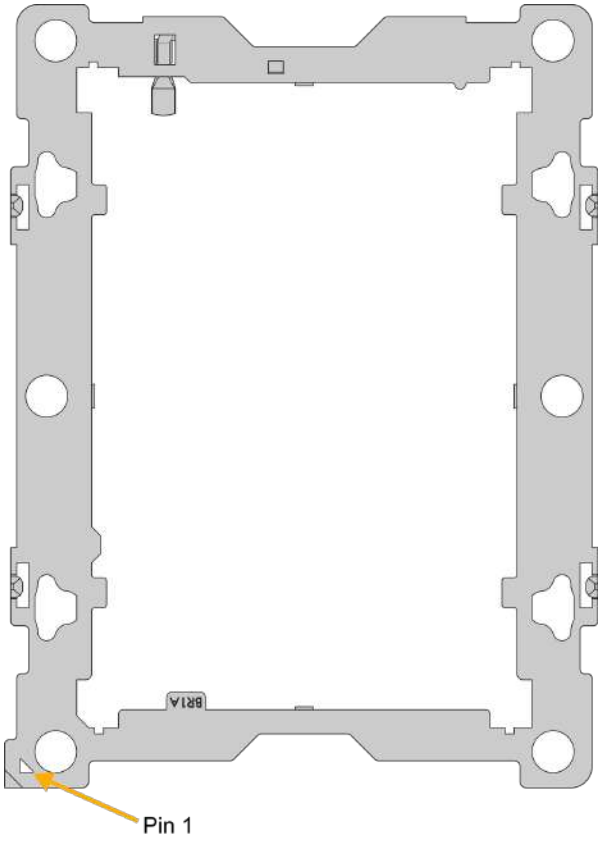


Figure 3-9. Carrier Top View

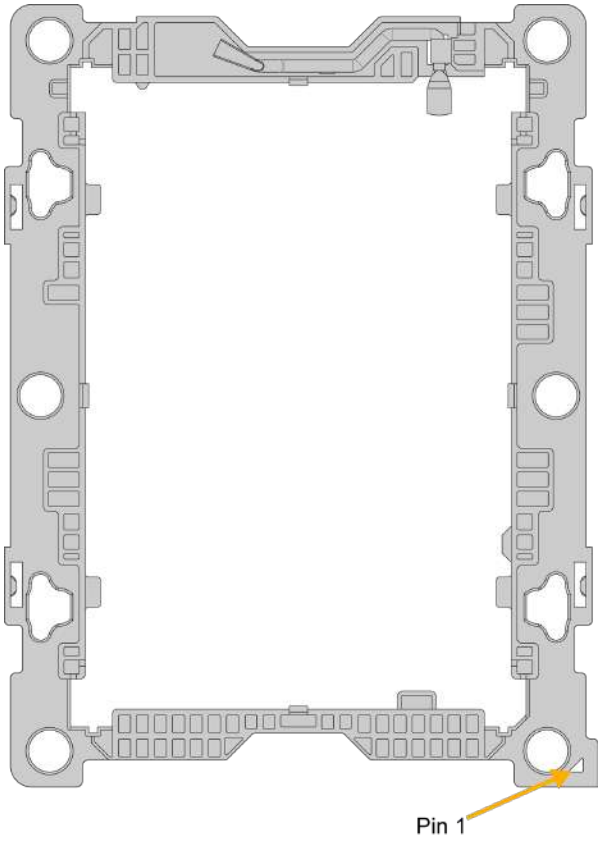


Figure 3-10. Carrier Bottom View

Overview of the Processor Socket

The processor socket is protected by a plastic protective cover.

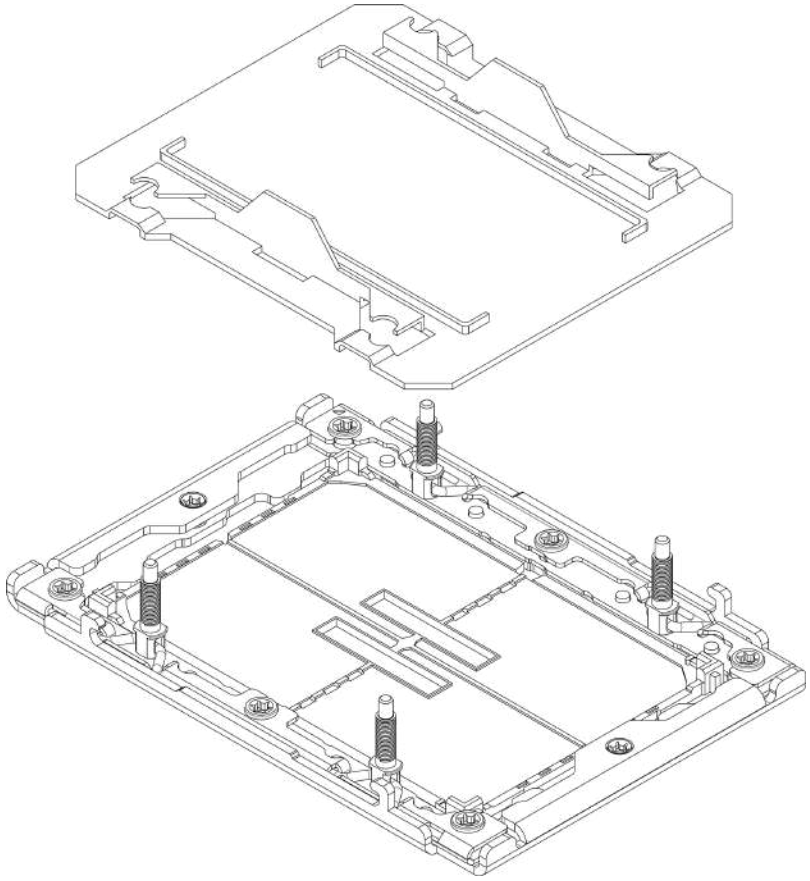


Figure 3-11. Plastic Protective Cover and Processor Socket

Overview of the Processor Heatsink Module

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

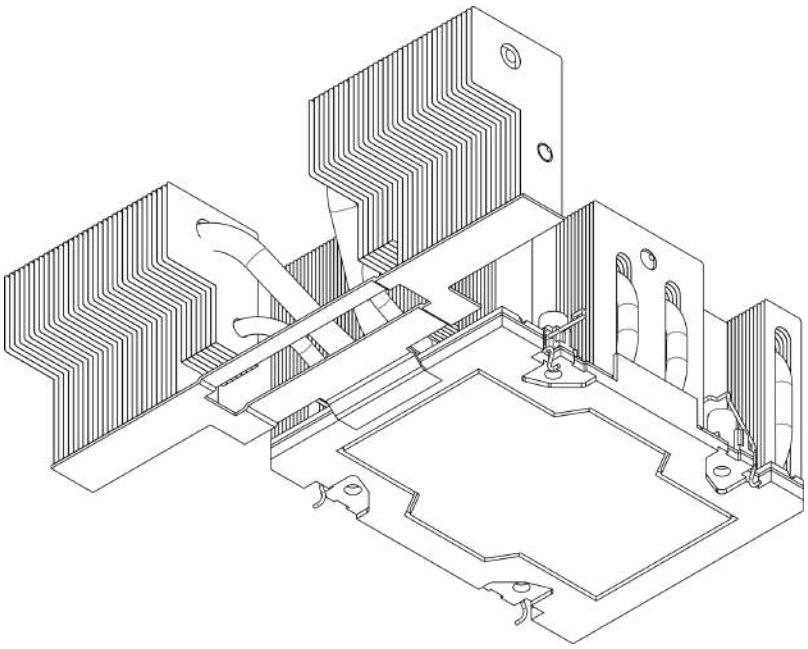


Figure 3-12. 2U Heatsink

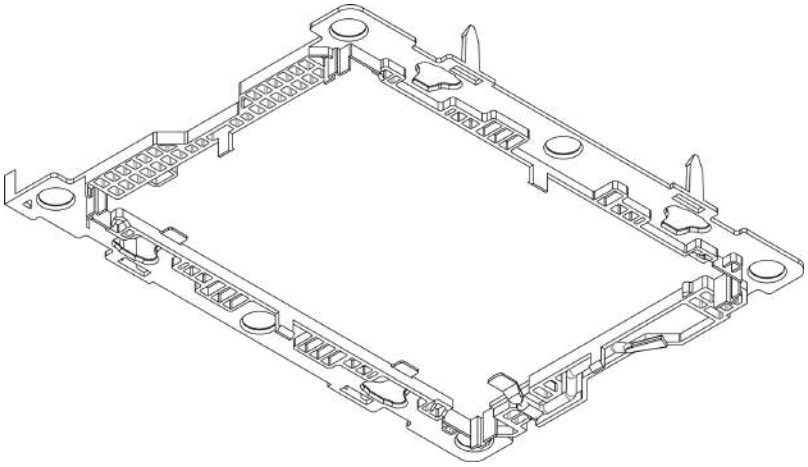


Figure 3-13. Carrier

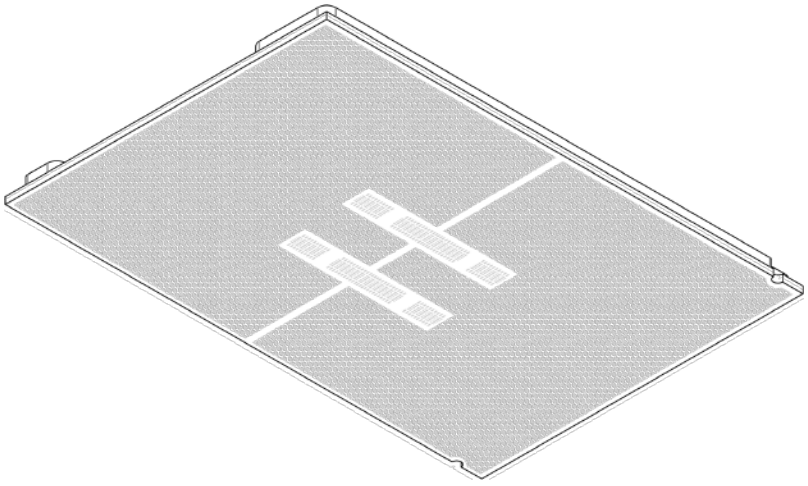


Figure 3-14. Processor

Installing the Processor

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

1. Ensure the lever on the processor carrier is pressed down and held by a latch on the processor carrier as shown below.

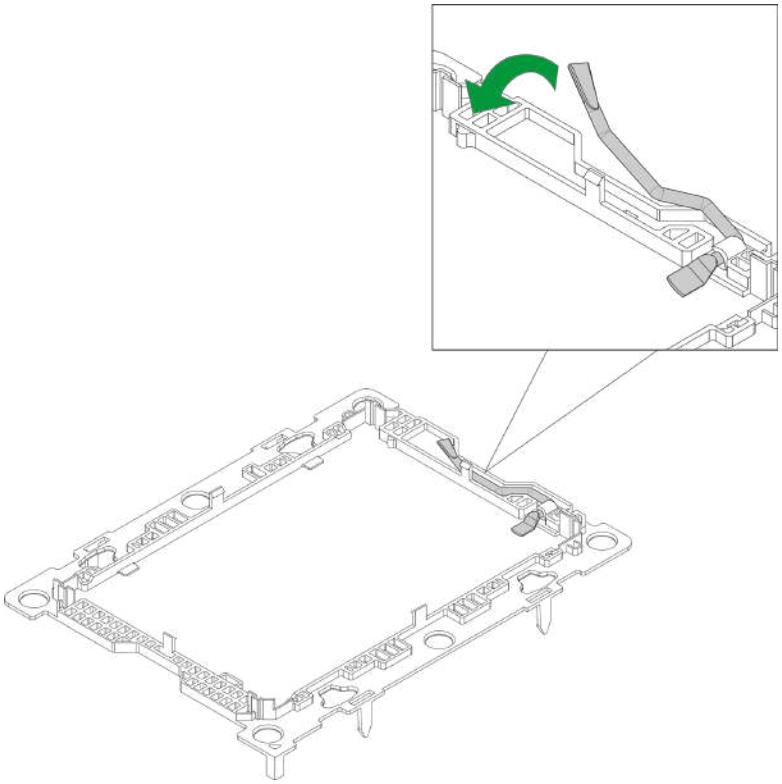


Figure 3-15. Carrier Lever

2. Hold the processor with the LGA lands (gold contacts) facing down. Locate the small, gold triangle in the corner of the processor and the corresponding hollowed triangle on the processor carrier. These triangles indicate pin 1.

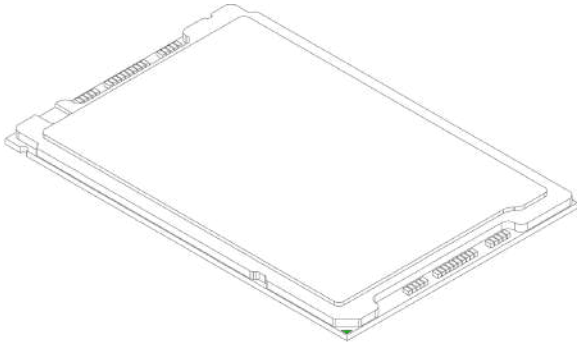


Figure 3-16. Processor

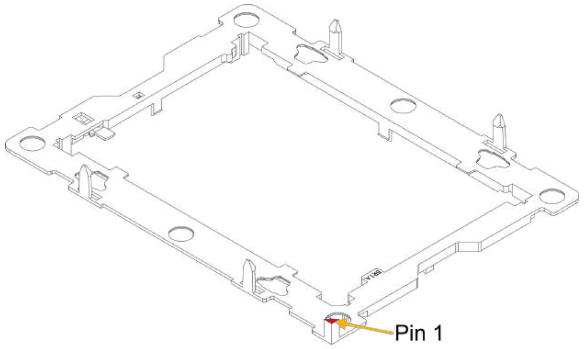


Figure 3-17. Carrier

3. While ensuring that the pin 1 triangles point towards the same direction, flip over the processor and processor carrier. Use the latches on the processor carrier to secure the processor onto the processor carrier. Processor keys on the processor and processor carrier will prevent securing the processor in an incorrect orientation.

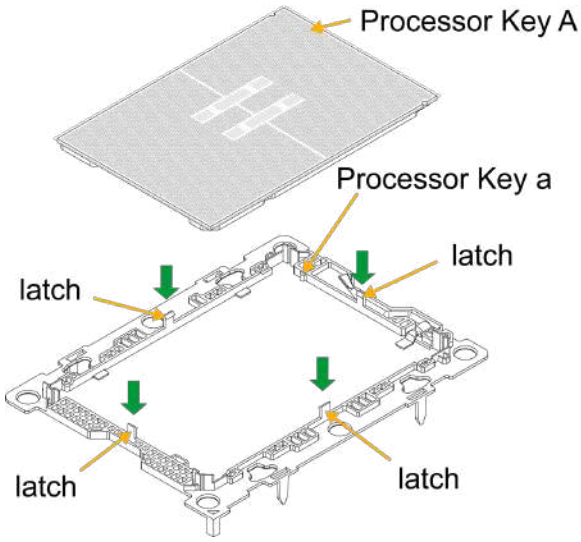


Figure 3-18. Key and Latch Locations

4. Examine all corners to verify that the processor is secured to the carrier. Two triangles indicating pin 1 on the processor and processor carrier should point towards the same direction.

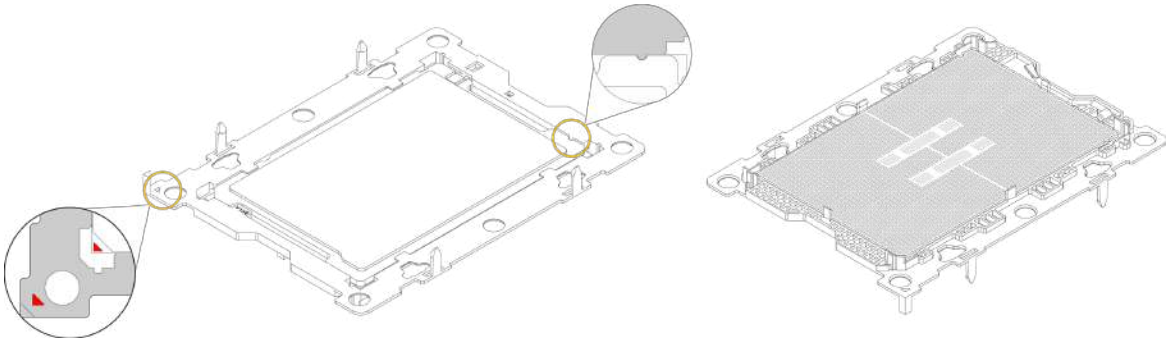


Figure 3-19. Processor and BR1A Keys and Latches

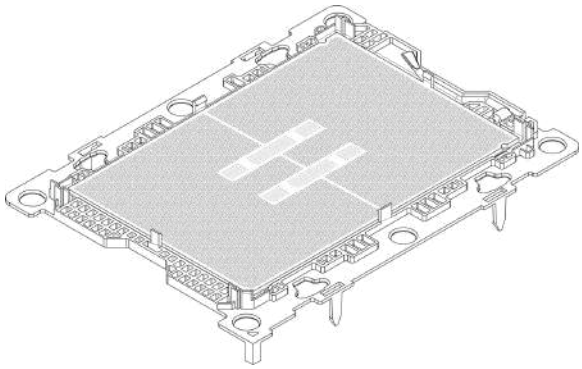


Figure 3-20. Completed Processor Carrier Installation

Assembling the Processor Heatsink Module

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

1. Note the extensions of the heatsink if it is an EVAC heatsink. Ensure these extensions are oriented towards the chassis fans.
2. If this is a new heatsink, the thermal grease has been pre-applied. Otherwise, apply the proper amount of thermal grease.
3. Hold the processor carrier so the processor's gold contacts are facing up, then align the holes of the processor carrier with the holes on the heatsink. Press the processor carrier down until it snaps into place. The plastic clips of the processor carrier will lock at the four corners.

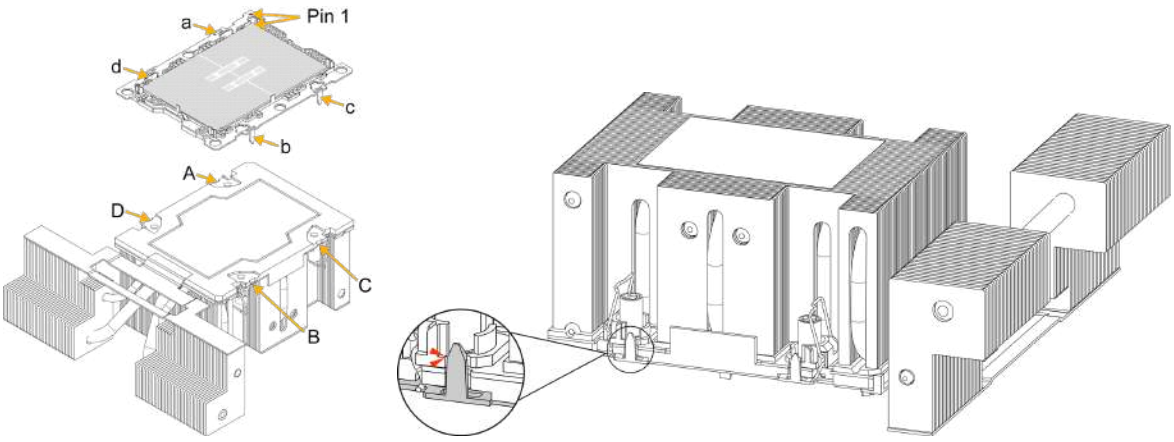


Figure 3-21. Carrier with 2U Heatsink (Left), PHM Plastic Clips Locked (Right)

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

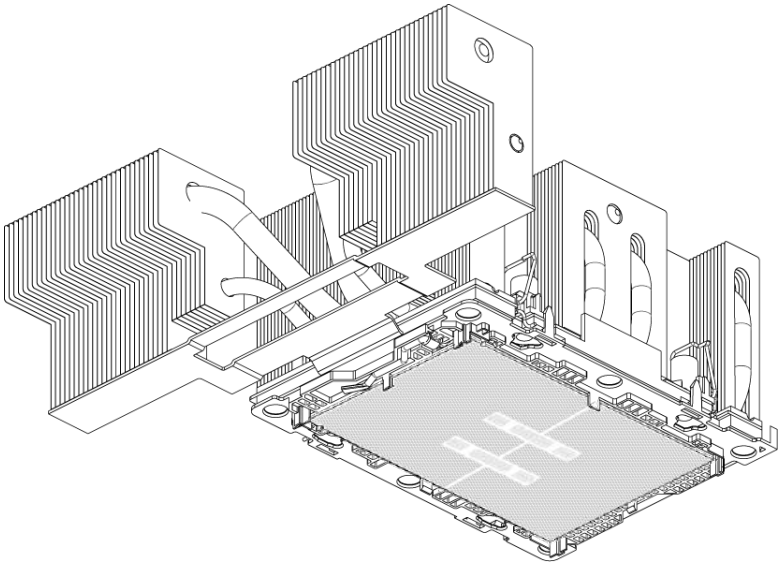


Figure 3-22. PHM Completed

Preparing to Install the PHM into the Processor Socket

After assembling the Processor Heatsink Module (PHM), you are ready to install it into the processor socket. To ensure the proper installation, follow the procedures below:

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

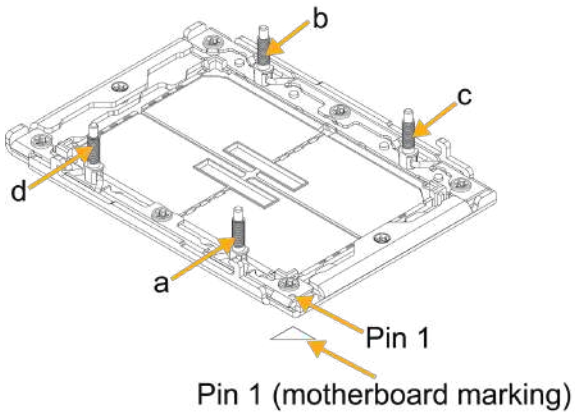


Figure 3-23. Threaded Fasteners

2. Locate the four PEEK nuts (marked A, B, C, and D) and four rotating wires (marked 1, 2, 3, and 4) on the heatsink. Align the PEEK nuts with the threads on the LGA-7529 (marked a, b, c, d).

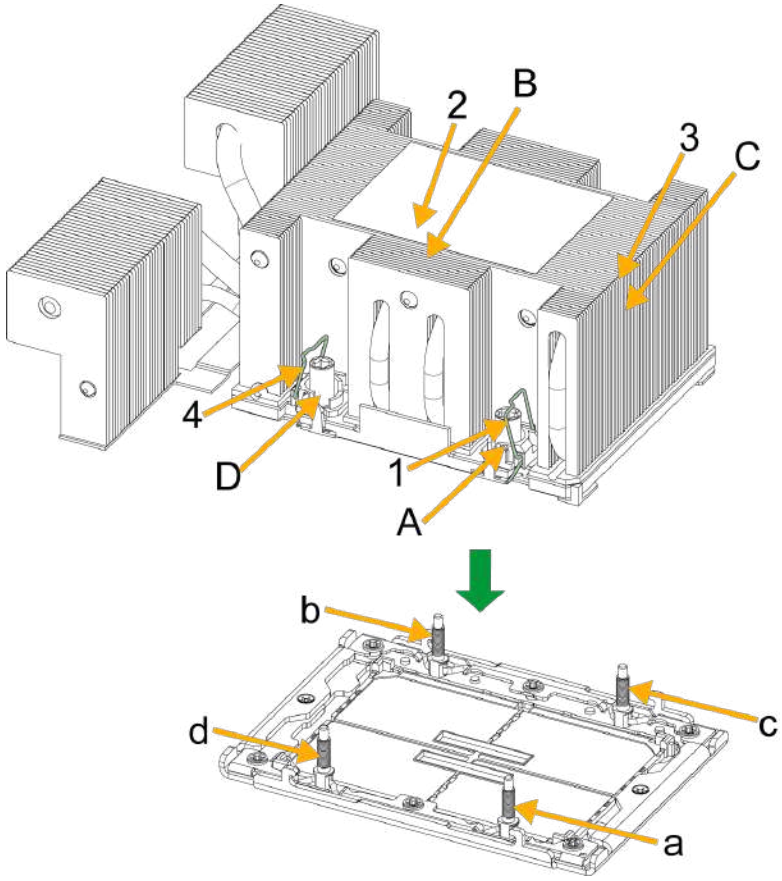


Figure 3-24. PEEK Nuts and Rotating Wires

3. Check the rotating wires (marked 1, 2, 3, and 4) to make sure that they are at unlatched positions before installing the PHM into the processor socket.

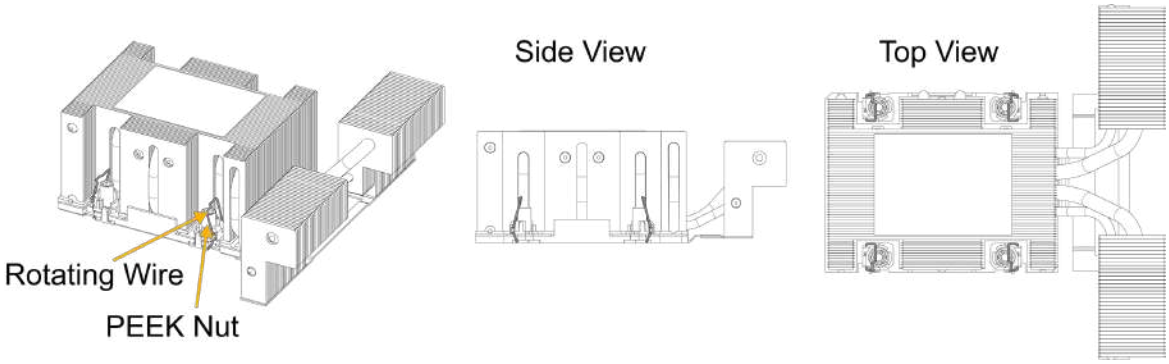


Figure 3-25. Unlatched Positions

Preparing the Processor Socket for Installation

This motherboard comes with a plastic protective cover installed on the processor socket. Remove it from the socket to install the Processor Heatsink Module (PHM). Gently pull up one corner of the plastic protective cover to remove it.

1. Press the tabs inward.

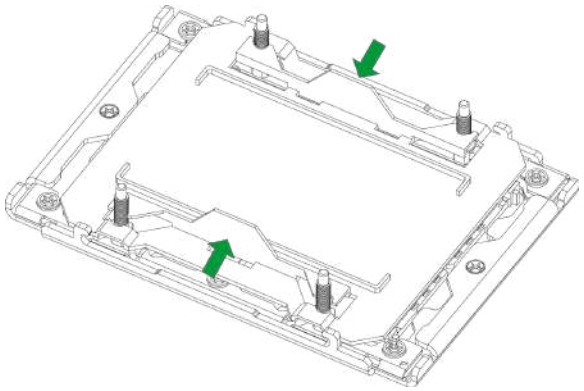


Figure 3-26. Processor Socket with Plastic Protective Cover

2. Pull up the protective cover from the socket.

Note: Do not touch or bend the socket pins.

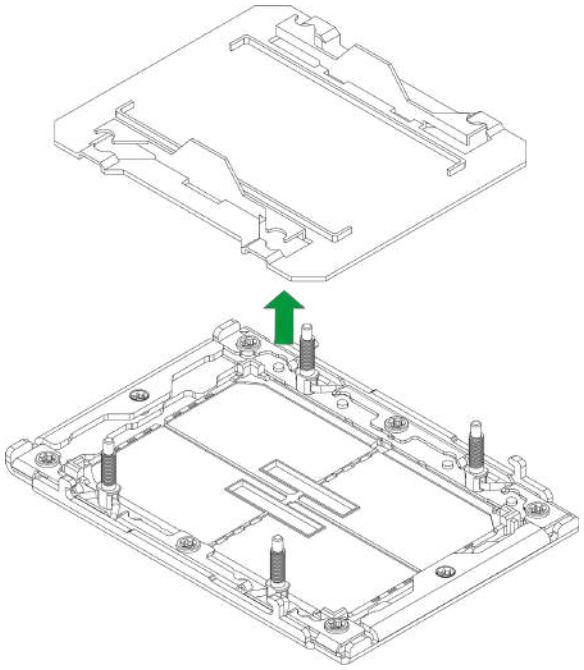


Figure 3-27. Plastic Protective Cover Removed

Installing the Processor Heatsink Module

1. Align pin 1 of the PHM with the printed triangle on the processor socket.
2. Make sure all four PEEK nuts of the heatsink (marked A, B, C, and D) are aligned with the threaded fasteners (marked a, b, c, and d), then gently place the heatsink on top of the processor socket.

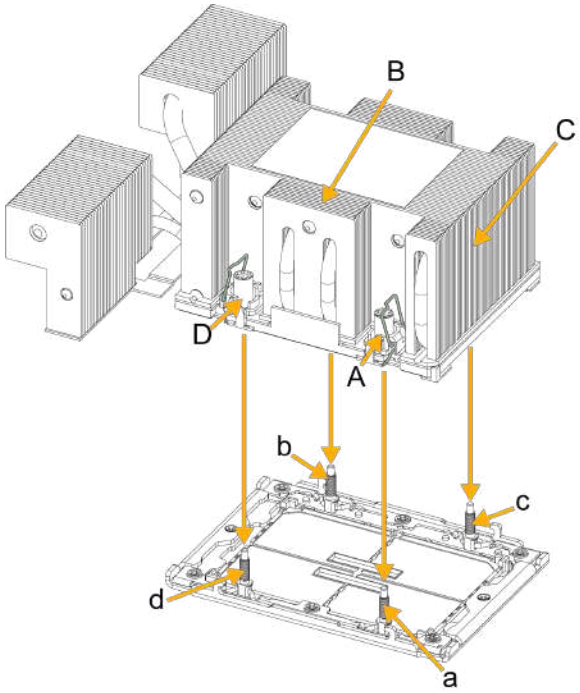


Figure 3-28. Aligning the 2U Heatsink with the Socket

3. Press all four rotating wires inwards and make sure that the heatsink is securely latched into the processor socket.

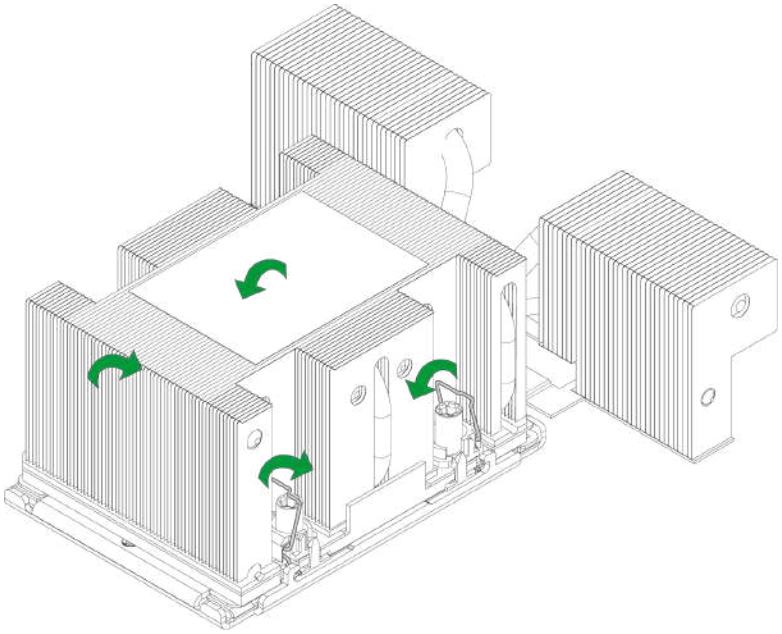


Figure 3-29. Latching the PHM

4. With a T30 bit torque driver set to a force of 8.0 lbf-in (0.904 N-m), gradually tighten the four screws to ensure even pressure. You can start with any screw, but make sure to tighten the screws in a diagonal pattern.

Important: Do not use a force greater than 8.0 lbf-in (0.904 N-m). Exceeding this force may over-torque the screw, causing damage to the processor, heatsink, and screw.

5. Examine all corners to ensure that the PHM is firmly attached to the socket.

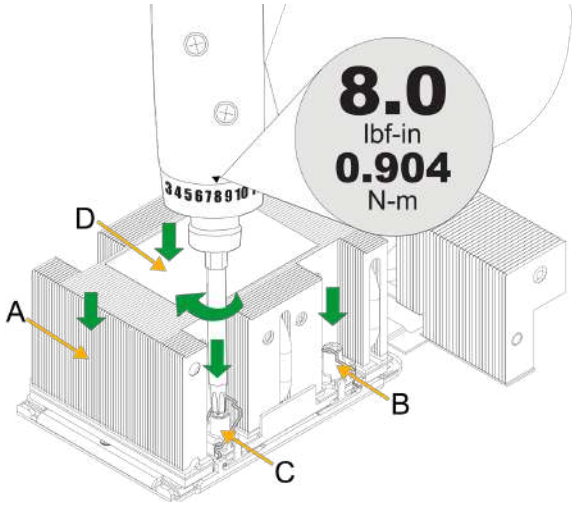


Figure 3-30. Installing the PHM with a Torque Driver

Removing the Processor Heatsink Module

Before removing the processor heatsink module (PHM) from the motherboard, shut down the system and then unplug the AC power cord from all power supplies.

Then follow the steps below:

1. Use a screwdriver to loosen the four screws. You can start with any screw, but make sure to loosen the screws in a diagonal pattern.

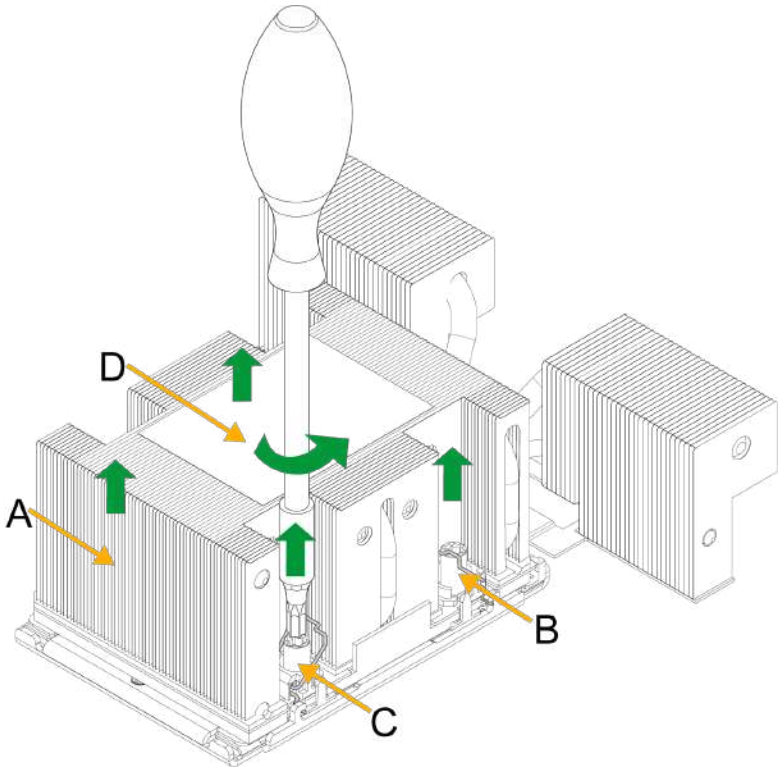


Figure 3-31. Loosening the Screws

2. Press the four rotating wires outwards to unlatch the PHM from the socket.

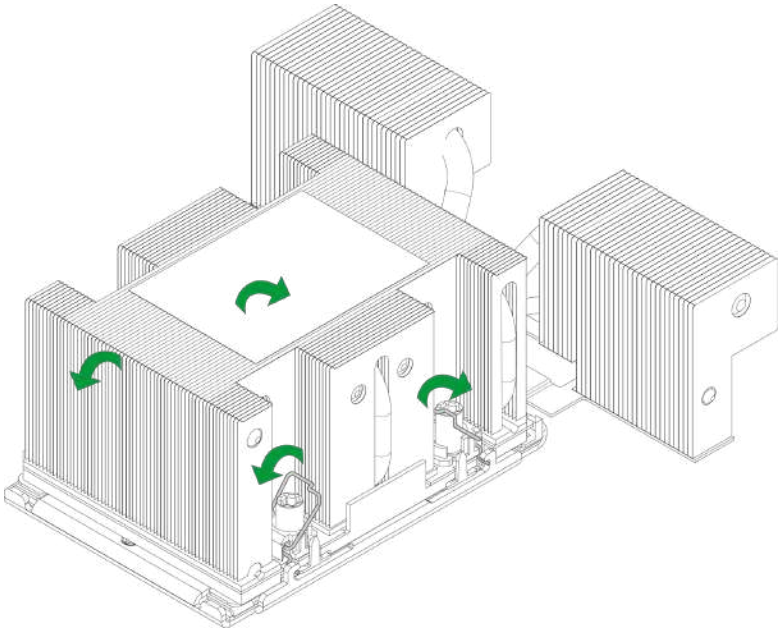


Figure 3-32. Unlatching the PHM

3. Gently lift the PHM upwards to remove it from the socket.

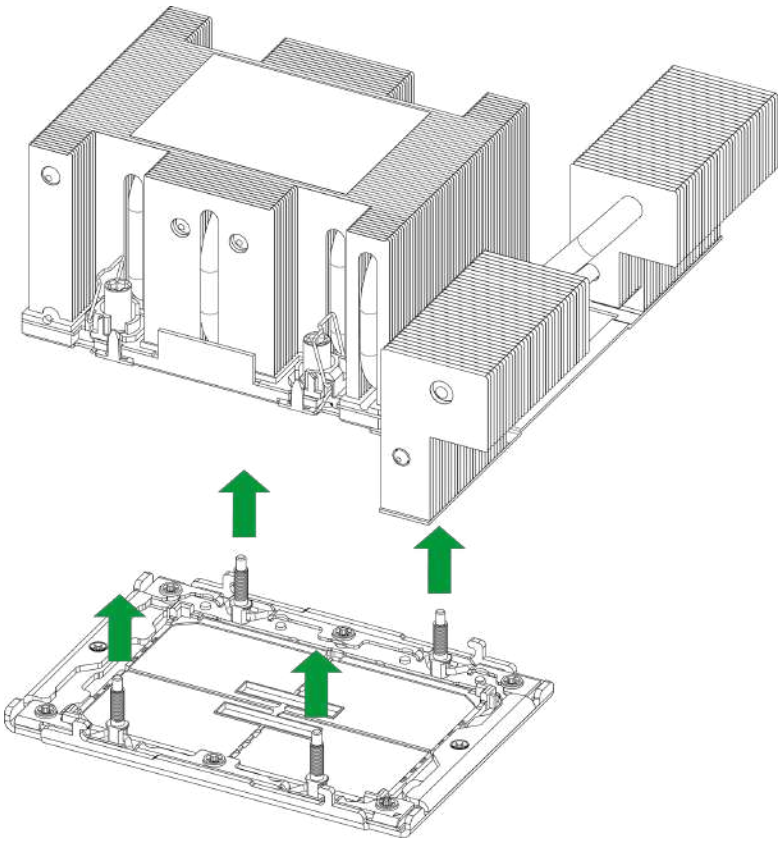


Figure 3-33. Removing the PHM from the Socket

4. To remove the processor from the heatsink, gently lift the lever from the processor carrier.

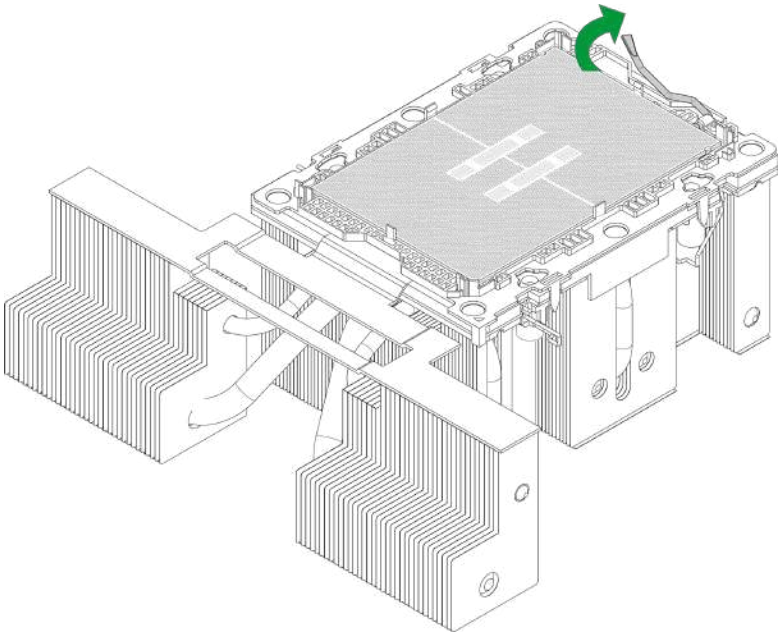


Figure 3-34. Carrier with 2U Heatsink

5. To remove the processor, move the lever to its unlocked position and gently remove the processor.

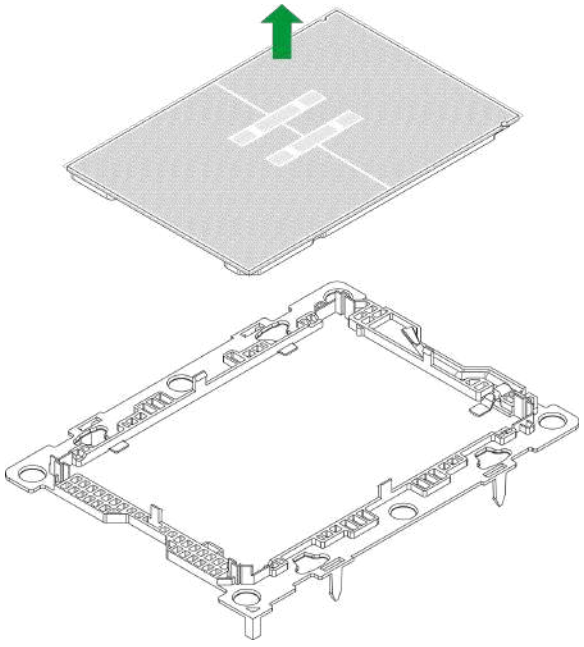


Figure 3-35. Removing the Processor

3.5 Memory Support and Installation

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

Note: Check the Supermicro website for recommended memory modules. Minimum and recommended host memory capacity can also be found on the Supermicro website.

General Guidelines for Optimizing Memory Performance

- Use DDR5 memory of the same type, size, and speed.
- DIMMs must be all DDR5 RDIMM, 3DS RDIMM, or MRDIMM.
- All DIMMs must operate at the same speed.
- Density mixing is not allowed.
- Frequency mixing is not allowed.
- Rank mixing is not allowed.

Memory Support

The MBD-X14DBG-DAP motherboard supports ECC DDR5 memory with speeds up to 6400 MT/s (1DPC), and MRDIMM DDR5 memory with speeds up to 8800 MT/s (1DPC) in 24 memory slots.

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

Intel® Xeon® 6900-Series Processors with P-Cores

<table>
<tr><th colspan="6">DDR5 Memory Support for Intel® Xeon® 6900-Series Processors with P-Cores</th></tr>
<tr><td rowspan="3">Type</td><td rowspan="3">Ranks Per DIMM, Data Width (Stack)</td><td colspan="3">DIMM Capacity (GB)</td><td>Speed (MT/s); Voltage (V); Slots per Channel (SPC) and DIMMs per Channel (DPC)</td></tr>
<tr><td colspan="3">DRAM Density</td><td>1DPC/1SPC</td></tr>
<tr><td>16 Gb</td><td>24 Gb</td><td>32 Gb</td><td>+1.1 V</td></tr>
</table>

DDR5 Memory Support for Intel® Xeon® 6900-Series Processors with P-Cores					
RDIMM	1Rx4	32 GB	48 GB	-	6400, 6000, 5600, 5200, 4800 (DDR5-6400 rated RDIMMs only)
	2Rx8	32 GB	48 GB	-	
	2Rx4	64 GB	96 GB	128 GB	
3DS RDIMM	8Rx4	256 GB	-	-	
	4Rx4	-	-	256 GB	
MRDIMM	2Rx8	32 GB	48 GB	-	8800, 8000, 7200 (MRDIMM-8800 only)
	2Rx4	64 GB	96 GB	128 GB	
	4Rx8	64 GB	96 GB	-	
	4Rx4 (2U)	128 GB	-	-	
	4Rx4 (2U)	-	-	256 GB	

Notes:

- Intel Xeon 6900-series processors with P-cores supports 1DPC configuration only
- Intel Xeon 6900-series processors with P-cores supports 1DIMM per processor socket with the following DIMM configuration only: 32 GB 2Rx8

CXL Memory Configuration Support for Intel® Xeon® 6900-Series Processors with P-Cores								
Native DDR5 Memory Per Socket				CXL Memory Per Socket				
Slot 1 DIMM Ranks	SLOT 1 DIMM Capacity (GB)	DIMM Type	DRAM Density (Gb)	CXL Memory Channels	CXL Memory Type	CXL Capacity Per Device/Module	CXL Interleave	CXL Mode
2Rx4	64	10x4	16	1+1	DDR5 x16	2ch 64 GB	Hetero x16	Hetero
2Rx4	64	10x4	16	2+2+2+2	DDR5 x8	64 GB	1x8*, 2x4, 4x2	1LM+Vol
2Rx4	64	10x4	16	1+1+1	DDR4 x8	128 GB	1x3 (BIOS)	1LM + Intel Flat Memory Mode

Notes:

1. The items with an asterisk (*) are the default settings in the BIOS
2. The Intel Xeon 6900-series processors with P-cores CXL memory configurations are 1DPC only for native DDR5
3. CXL Memory Channel: number of devices per root port, with root ports separated by "+", e.g. 2+2+2+2 = four root ports populated with two devices per root port
4. CXL Interleave: sets x ways, e.g. 2x4 = Set of two modules, interleaved four-way
5. CXL Modes:

- 1LM + Vol = DDR5 ('1LM') and (volatile) CXL memory visible to SW as separate tiers, separately interleaved
- Hetero x16 = DDR5 and (volatile) CXL memory interleaved together in one 16-way set
- Flat Memory Mode = HW manages data movement between DDR5 and CXL memory, total capacity visible to SW

Note: DIMM rank mixing is not allowed.

Intel® Xeon® 6900-Series Processors with P-Cores DDR5 Memory Population Table (2 Processors and 24 DIMMs Installed, 1DPC)	
1 Processor DIMM Counts	***Memory Population Sequence (1DPC)***
1 Processor and 1 DIMM	P1-DIMMA1
1 Processor and 8 DIMMs	P1-DIMMC1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1/P1-DIMMI1/P1-DIMMJ1/P1-DIMMK1/P1-DIMML1
1 Processor and 8 DIMMs	P1-DIMMA1/P1-DIMMB1/P1-DIMMD1/P1-DIMME1/P1-DIMMG1/P1-DIMMH1/P1-DIMMJ1/P1-DIMMK1
1 Processor and 8 DIMMs	P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMF1/P1-DIMMG1/P1-DIMMH1/P1-DIMMI1/P1-DIMML1
1 Processor and 12 DIMMs	P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1/P1-DIMMG1/P1-DIMMH1/P1-DIMMI1/P1-DIMMJ1/P1-DIMMK1/P1-DIMML1

Intel® Xeon® 6900-Series Processors with P-Cores DDR5 Memory Population Table (2 Processors and 24 DIMMs Installed, 1DPC)	
2 Processor DIMM Counts (Recommended)	***Memory Population Sequence (1DPC)***
2 Processors and 2 DIMMs	P1-DIMMA1 P2-DIMMA1
2 Processors and 16 DIMMs	P1-DIMMC1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1/P1-DIMMI1/P1-DIMMJ1/P1-DIMMK1/P1-DIMML1 P2-DIMMC1/P2-DIMMD1/P2-DIMME1/P2-DIMMF1/P2-DIMMI1/P2-DIMMJ1/P2-DIMMK1/P2-DIMML1
2 Processors and 16 DIMMs	P1-DIMMA1/P1-DIMMB1/P1-DIMMD1/P1-DIMME1/P1-DIMMG1/P1-DIMMH1/P1-DIMMJ1/P1-DIMMK1 P2-DIMMA1/P2-DIMMB1/P2-DIMMD1/P2-DIMME1/P2-DIMMG1/P2-DIMMH1/P2-DIMMJ1/P2-DIMMK1
2 Processors and 16 DIMMs	P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMF1/P1-DIMMG1/P1-DIMMH1/P1-DIMMI1/P1-DIMML1 P2-DIMMA1/P2-DIMMB1/P2-DIMMC1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1/P2-DIMMI1/P2-DIMML1
2 Processors and 24 DIMMs	P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1/P1-DIMMG1/P1-DIMMH1/P1-DIMMI1/P1-DIMMJ1/P1-DIMMK1/P1-DIMML1 P2-DIMMA1/P2-DIMMB1/P2-DIMMC1/P2-DIMMD1/P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1/P2-DIMMI1/P2-DIMMJ1/P2-DIMMK1/P2-DIMML1

DIMM Installation

Important: To avoid causing any damage to the memory module or the DIMM socket, do not use excessive force when pressing the release tabs on the ends of the DIMM socket. Handle memory modules with care. To avoid ESD-related damage to your memory modules or components, carefully follow all the instructions given in "Static-Sensitive Devices" on page 49.

1. Insert the desired number of DIMMs into the memory slots based on the recommended DIMM population table earlier in this section.
2. Push the release tabs outwards on both ends of the DIMM slot to unlock it.

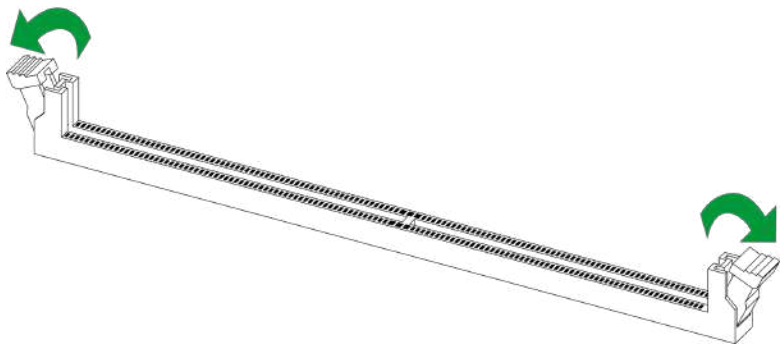


Figure 3-36. Unlocking the DIMM Slot

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

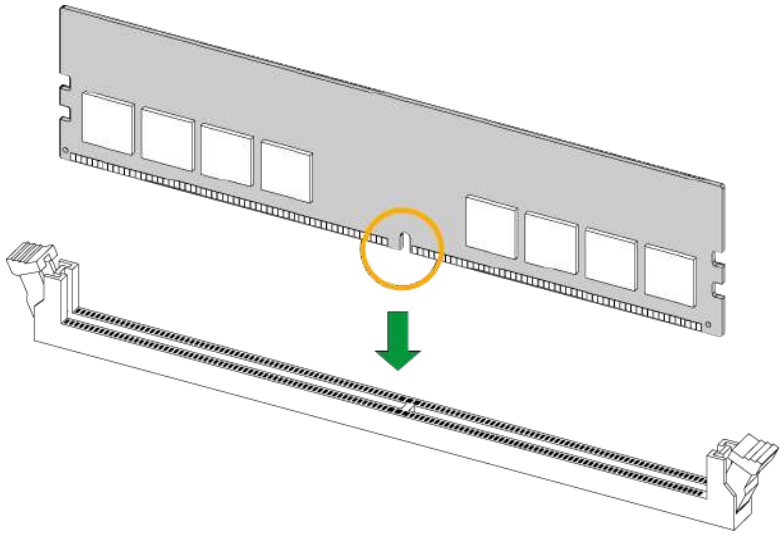


Figure 3-37. Aligning the DIMM Slot with the Receptive Point

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

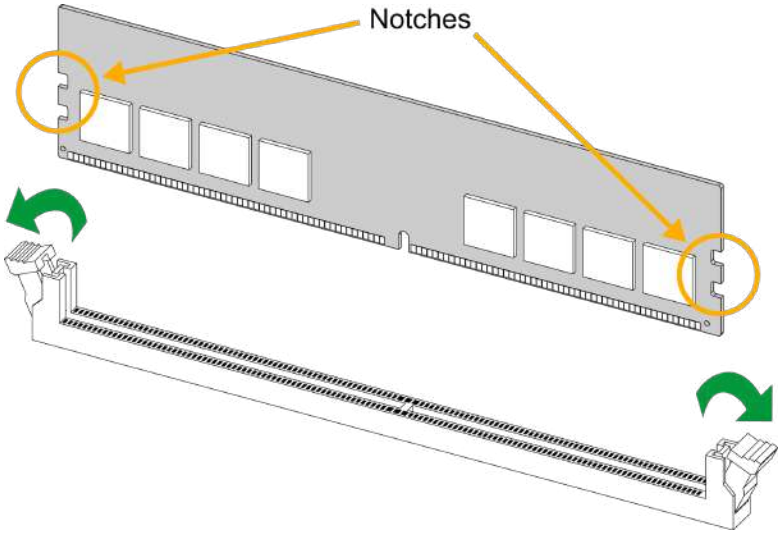


Figure 3-38. Aligning the Notches

5. Press both ends of the module straight down into the slot until the module snaps into place.
6. Press the release tabs to the lock positions to secure the DIMM into the slot.

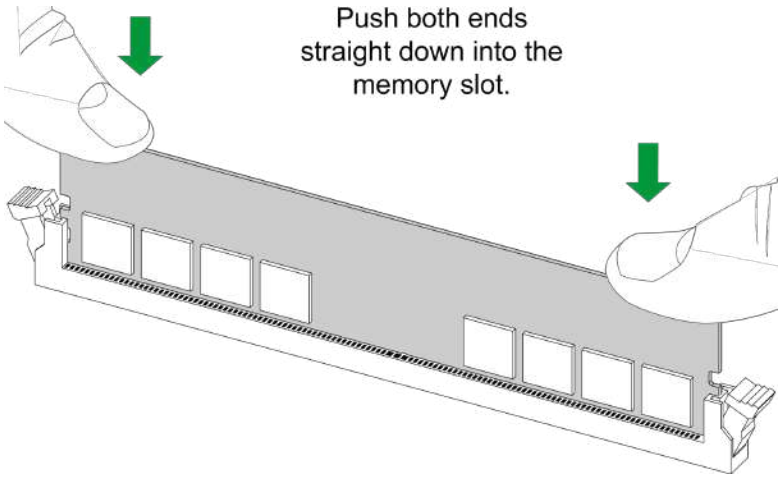


Figure 3-39. Securing the DIMM

For a detailed diagram of the MBD-X14DBG-DAP motherboard, see the layout under "Motherboard Quick Reference" on page 24.

DIMM Removal

Important: To avoid causing any damage to the memory module or the DIMM socket, do not use excessive force when pressing the release tabs on the ends of the DIMM socket. Handle memory modules with care. To avoid ESD-related damage to your memory modules or components, carefully follow all the instructions given in "Static-Sensitive Devices" on page 49.

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

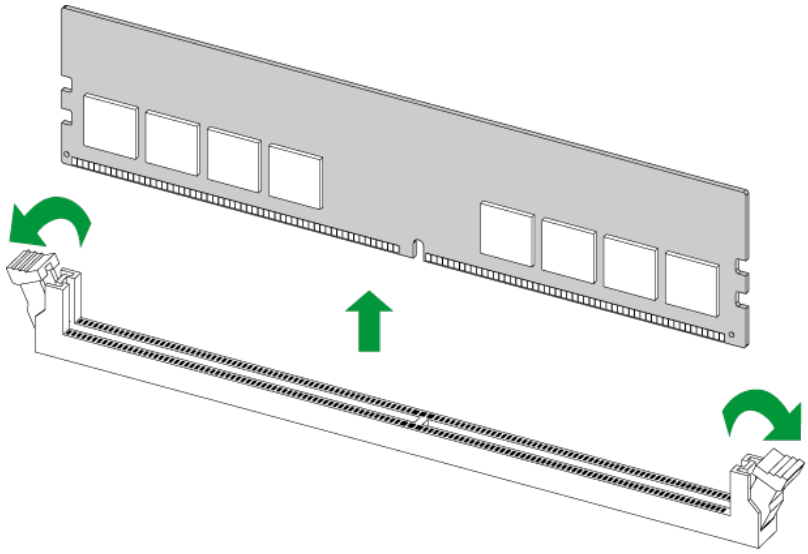


Figure 3-40. Unlocking the DIMM Slot

For a detailed diagram of the MBD-X14DBG-DAP motherboard, see the layout under "Motherboard Quick Reference" on page 24.

3.6 Motherboard Battery Removal and Installation

Battery Removal

To remove the onboard battery, follow the steps below:

1. Power off your system and unplug your power cable.
2. Place the system on a workbench.
3. Remove the top cover from the system.
4. Locate the onboard battery as shown below.
5. Using a tool such as a pen or a small screwdriver, push the battery lock outwards to unlock it. Once unlocked, the battery will pop out from the holder.
6. Remove the battery.

Proper Battery Disposal

Important: 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. Comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

Battery Installation

To install an onboard battery, follow steps 1 and 2 above and continue below:

Important: When replacing a battery, be sure to only replace it with the same type.

1. Identify the battery's polarity. The positive (+) side should be facing up.
2. Insert the battery into the battery holder and push it down until you hear a click to ensure that the battery is securely locked.

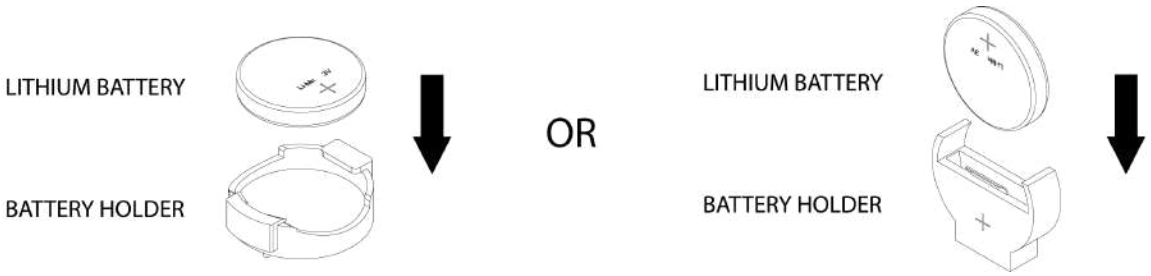


Figure 3-41. Installing a Battery

3.7 Storage Drives

The SYS-A22GA-NBRT has ten 2.5" NVMe drive bays at the front of the chassis. The drives are mounted in drive carriers that simplify their removal from the chassis. These carriers help promote proper airflow.

The SYS-A22GA-NBRT has two M.2 slots at the front of the chassis. Refer to "M.2 SSDs" on page 81 for more details.

Note: Enterprise-level storage modules are recommended for use in Supermicro servers.

Figure 3-42. Storage Drive Locations

Drive Bay Locations	
Bay	**Description**
0–9	10 hot-swap 2.5" NVMe drive bays
10–11	Two serviceable NVMe M.2 slots

Installing 2.5" NVMe SSDs into the Chassis

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

1. Remove the drive carrier from the chassis. Push the release button on the drive carrier to release and extends the drive carrier handle. Use the handle to pull the carrier out of the chassis as shown below.

   Note: If the button does not release the handle, it may be locked: using a flat-head screwdriver, rotate the screw counterclockwise 45 degrees to unlock the handle.

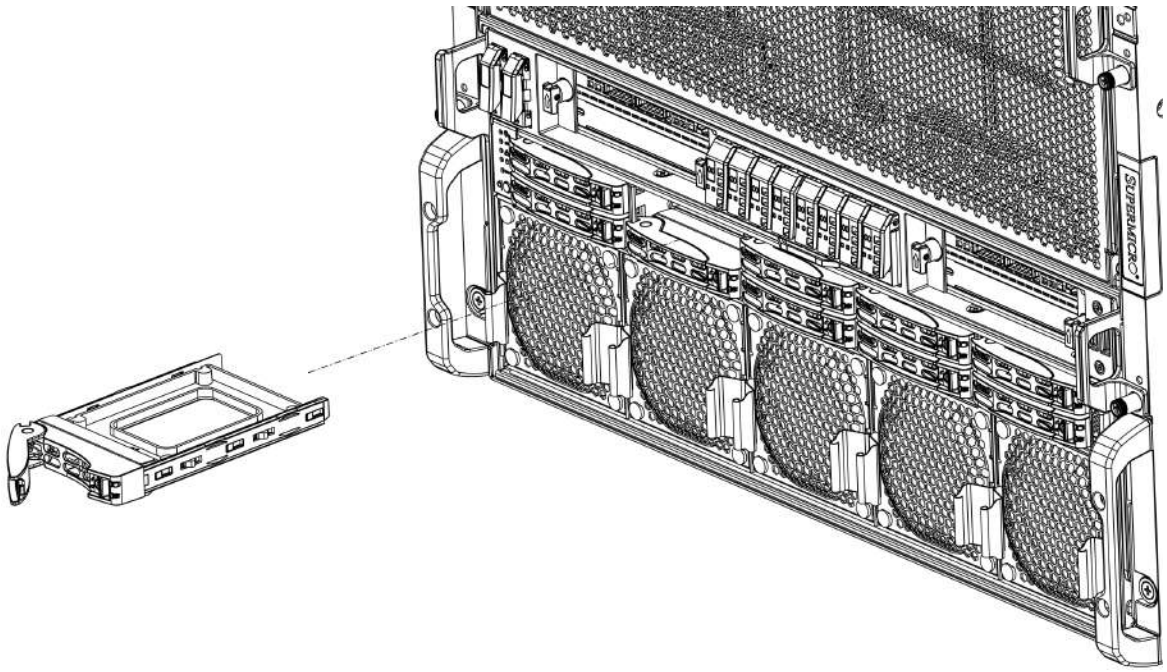


Figure 3-43. Removing a Drive Carrier

2. Insert the drive into the carrier and secure the drive to the carrier, as shown below. Orient the drive with the connector facing the bottom rear of the carrier as shown. The drive can be inserted from above the carrier and into the clips until a "click" is heard.

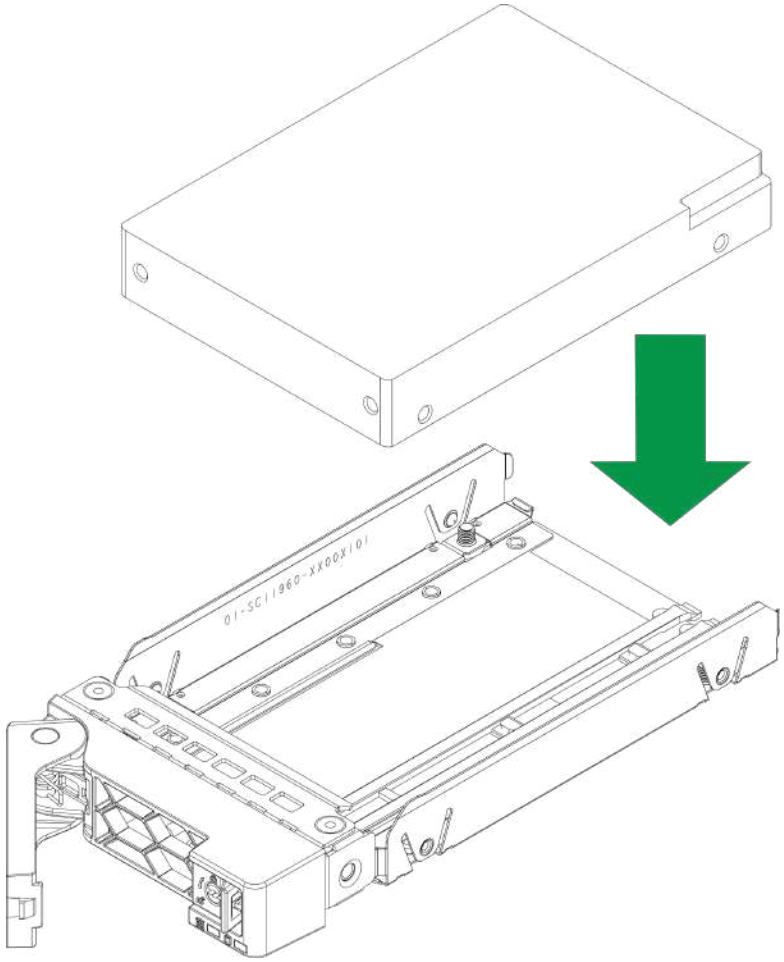


Figure 3-44. Placing a 2.5" Storage Drive into the Drive Carrier

3. Secure the storage drive on to the carrier with bottom screws, if needed.
4. Insert the carrier with the storage drive into the open drive bay.

M.2 SSDs

The SYS-A22GA-NBRT contains two slots for M.2 SSDs at the front of the chassis.

M.2 is a compact, high-performance SSD form factor used in modern devices. It supports the NVMe interface, offering fast data transfer rates and low latency. Its small size allows for flexible installation in laptops, desktops, and servers, enhancing overall storage efficiency and speed.

Installing M.2 SSDs into the Chassis

To install an M.2 SSD, insert the device into the slot of choice. Be sure that it is mounted all the way in. Refer to the illustration below.

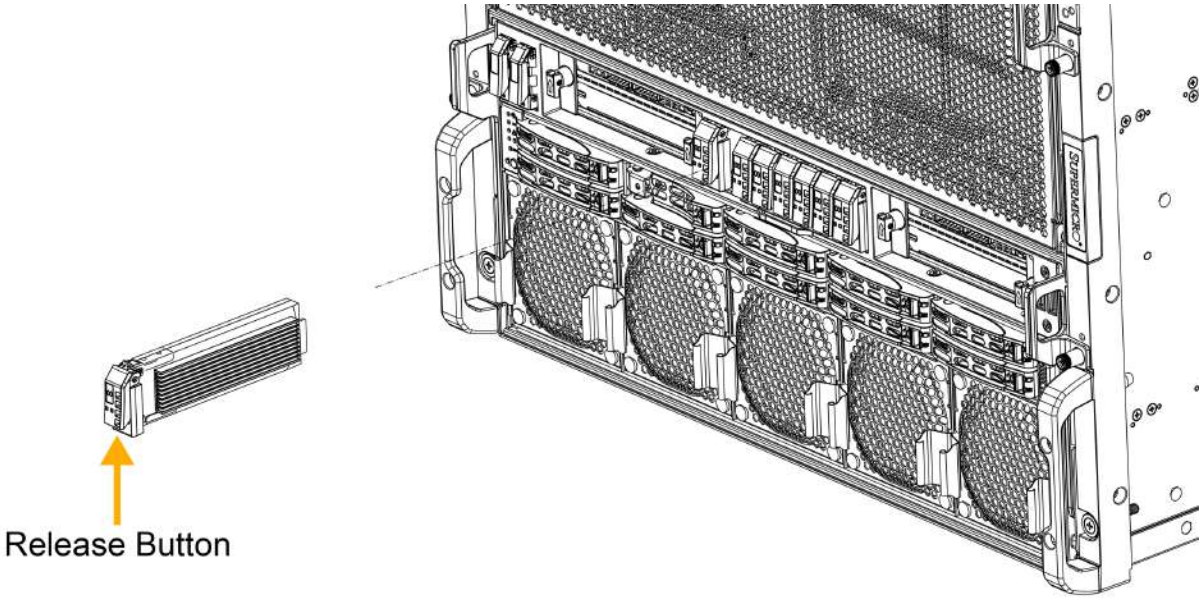


Figure 3-45. Installing an M.2 Storage Device

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.

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.

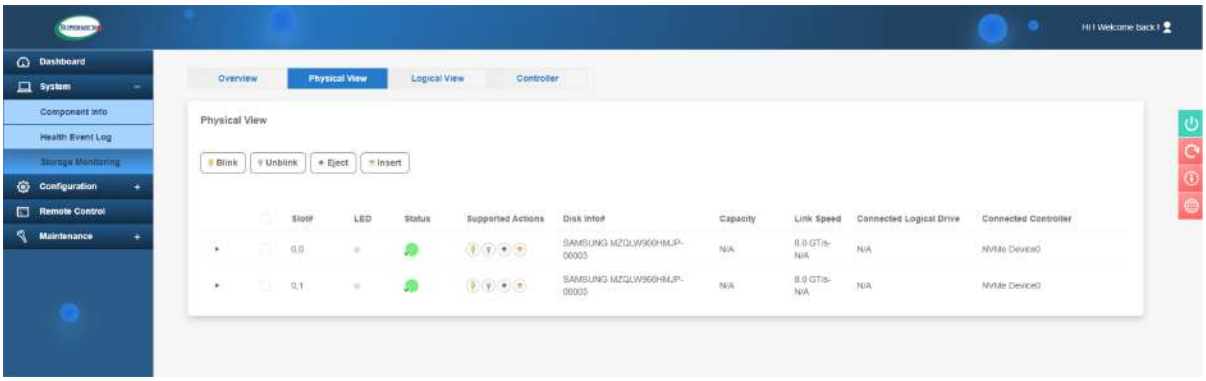


Figure 3-46. BMC Screenshot

Replacing a 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.

3.8 System Cooling

Refer to the following sections for information about the cooling capabilities of the SYS-A22GA-NBRT server.

Fans

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

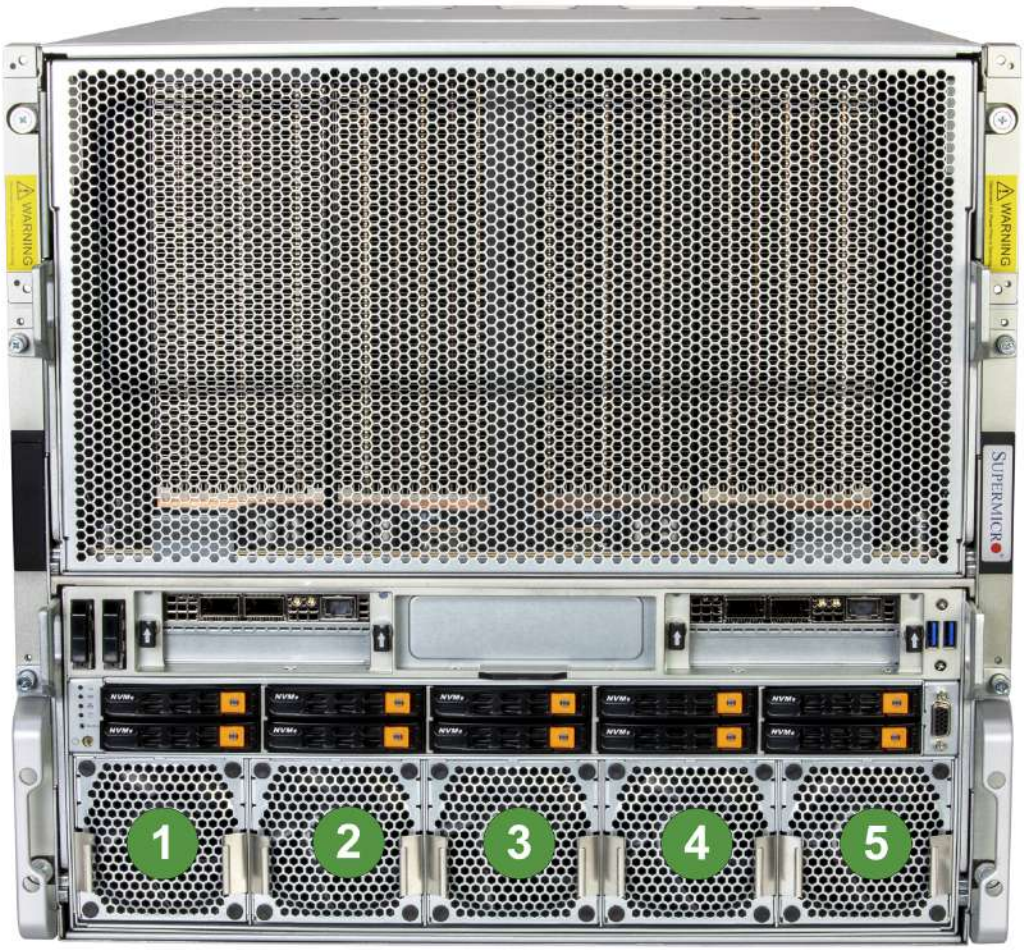


Figure 3-47. Front Fan Locations

Front Fan Locations	
Location	**Slot Description**
1–5	Five hot-swap fans

Figure 3-48. Rear Fan Locations

Rear Fan Locations	
Location	**Slot Description**
6–11	10 hot-swap fans

Replacing System Fans

There are 10 high-speed system fans on the rear of the chassis.

1. Determine which fan has failed using a remote management utility.
2. Remove the failed fan from chassis by squeezing the two release tabs together and pulling the fan out.

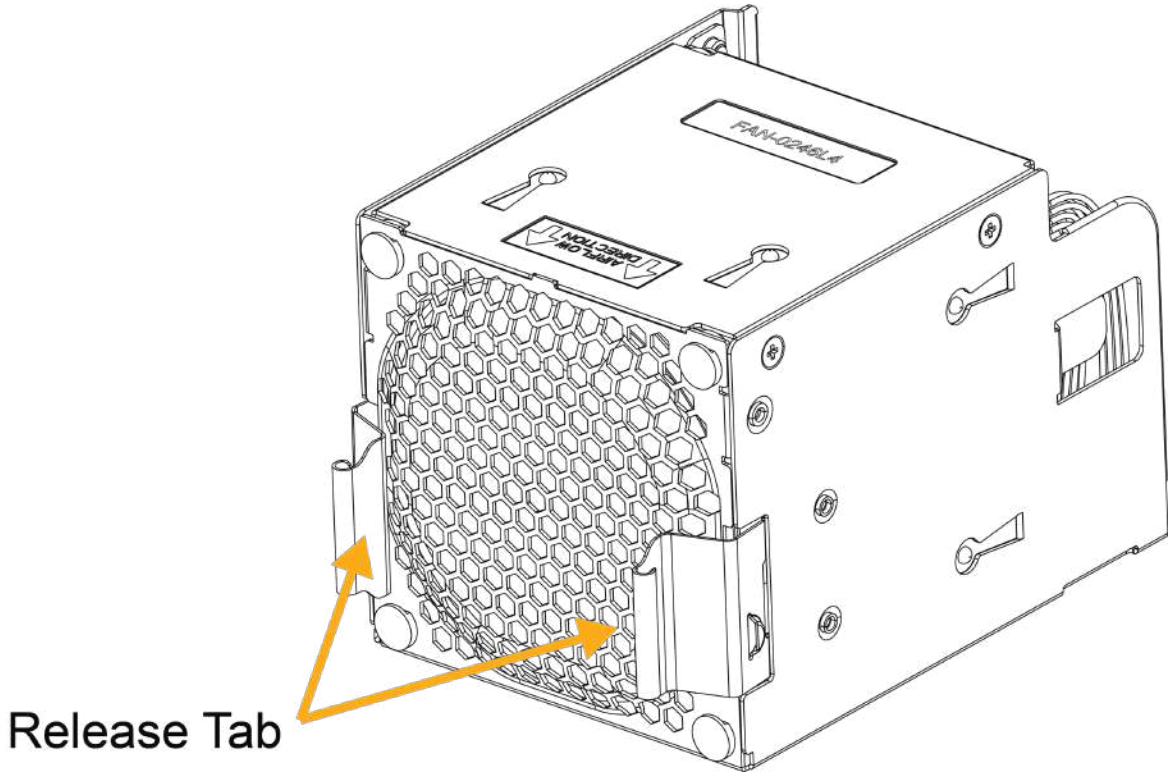


Figure 3-49. Releasing the Fan from the Chassis

3. Install a new fan into the drive tray.

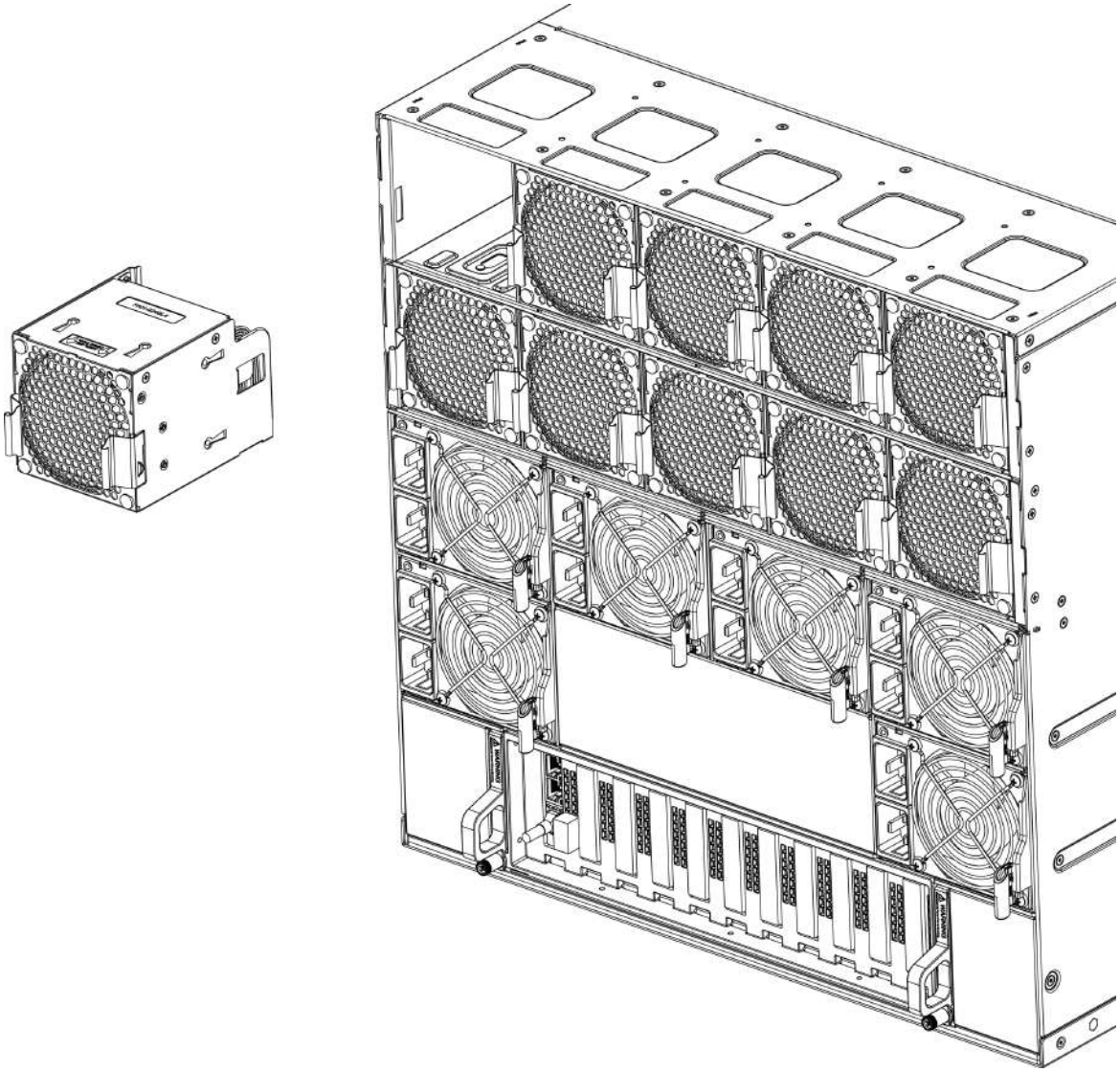


Figure 3-50. Installing a New Fan into the Chassis Rear

- Make sure there are no objects to obstruct air flow in and out of the server.
- If you are using a front bezel, make sure the bezel filter is replaced periodically.
- Do not operate the server without drives or drive trays in the drive bays.
- Use only recommended server parts.
- Make sure no wires or foreign objects obstruct air flow through the chassis. Pull all excess cabling out of the airflow path or use shorter cables.

Air Shrouds

The system requires air shrouds for each drawer to maximize airflow efficiency. The motherboard, any expansion cards, and all components must be installed in the chassis prior to installing the air shroud. Place the air shroud as pictured.

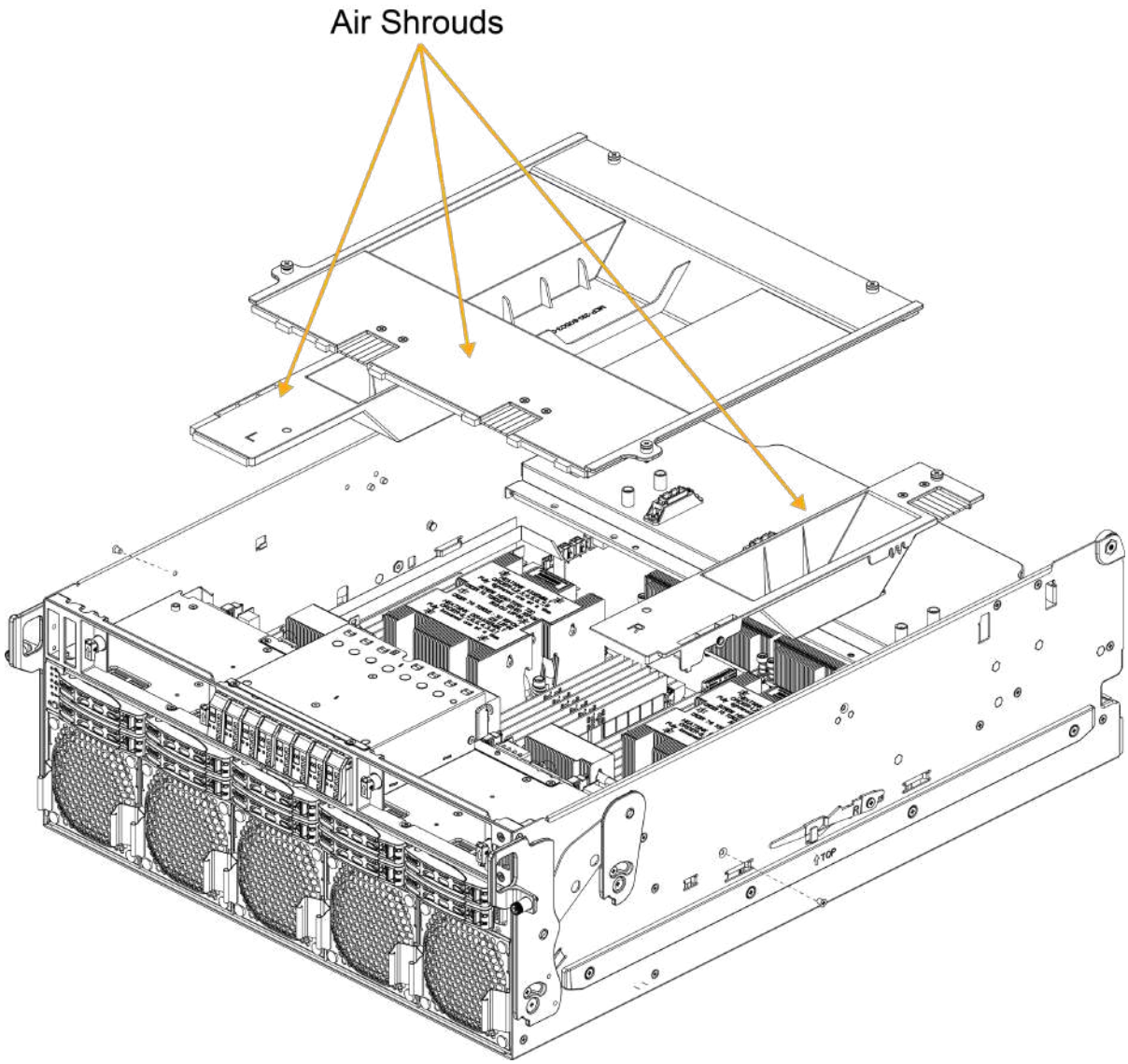


Figure 3-51. Installing the CPU Drawer Air Shroud

1. First, ensure the CPU, CPU heatsinks, and configured DIMMs are installed.
2. Align the air shroud with the motherboard.
3. Install directly onto the motherboard. Tighten the four screws on the top of the air shroud and two on the air shroud sides.

3.9 GPU

The SYS-A22GA-NBRT features an NVIDIA SXM GPU-NVHGX-B200-8180 subsystem, which is oriented in the server as shown below.

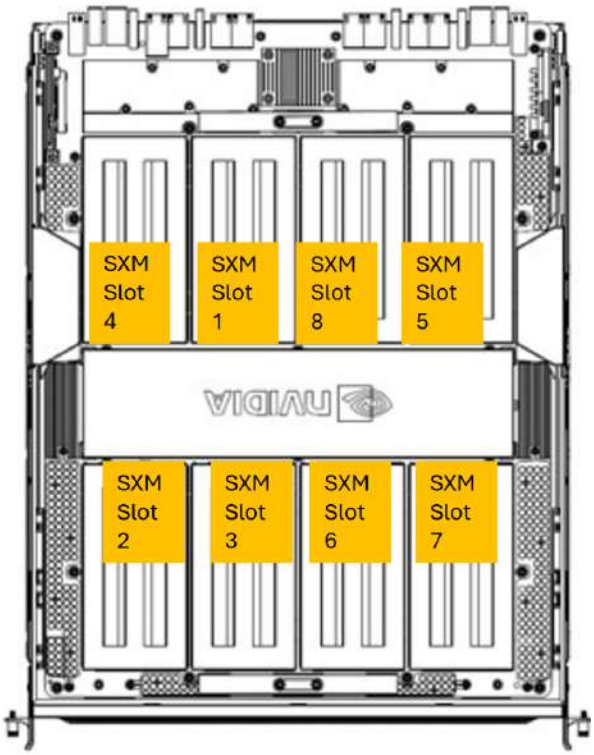


Figure 3-52. GPU SXM Slot Locations

GPU Mapping		
BMC Interface Numbering	**GPU Slot Numbering**	**OS (NVIDIA-SMI) Numbering**
GPU1	SXM8	GPU2
GPU2	SXM7	GPU0
GPU3	SXM6	GPU3
GPU4	SXM5	GPU1
GPU5	SXM4	GPU6
GPU6	SXM3	GPU4
GPU7	SXM2	GPU7
GPU8	SXM1	GPU5

3.10 Expansion Cards

Refer to the following sections for information on the expansion cards supported by the SYS-A22GA-NBRT server.

PCIe Cards

The SYS-A22GA-NBRT supports up to 10 low-profile PCIe slots in a pull-out drawer for simple installation and maintenance.

Figure 3-53. Expansion Card Locations

Expansion Card Locations	
Location	**Slot Description**
11, 12	PCIe 5.0 x16 FHHL from PLX switch (North-South)

LPIO Drawer

The LPIO drawer is located in the rear of the chassis along with the system fans and power supplies. Removing the drawer is as simple as unlocking two levers and pulling out the drawer. For information on removing the LPIO drawer see "Accessing the System" on page 43.

Installing Low-Profile PCIe Cards

There are 10 low-profile PCIe slots in the LPIO drawer.

1. Insert the PCIe card directly into a slot.
2. Secure with the provided screw.
3. Slide the LPIO drawer back into the chassis.
4. Lock using the locking levers.

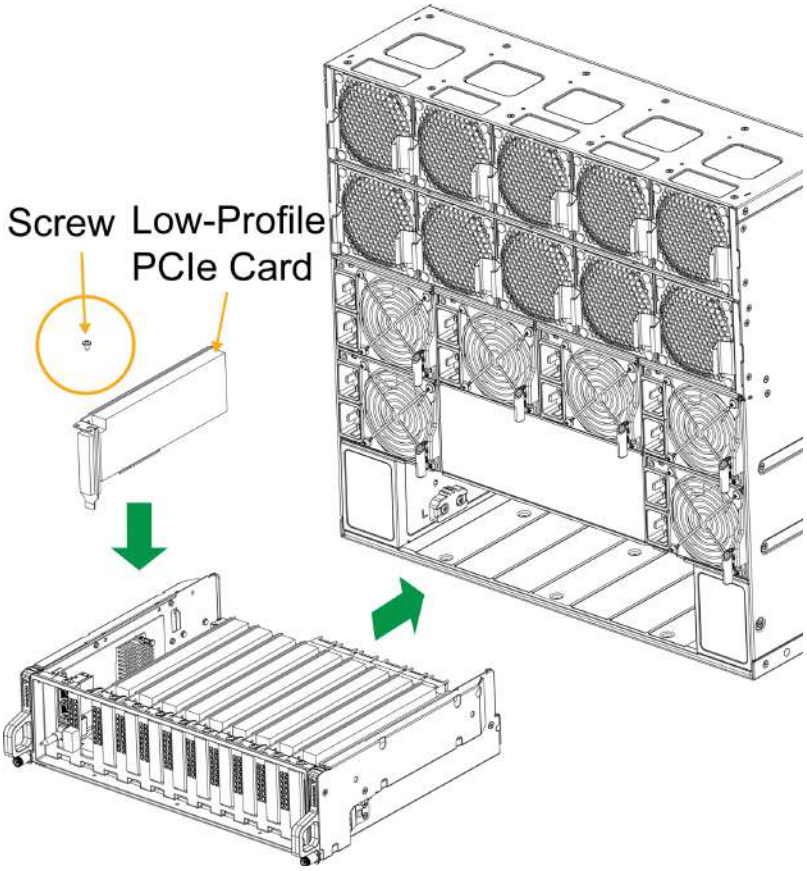


Figure 3-54. Installing Low-Profile PCIe Cards

Risers and I/O Cards

The CPU drawer has four total PCIe slots that are supported by riser cards. These slots are most often used to house I/O devices such as network interface cards and host adapters to connect to other servers.

Removing the Riser Cards

The riser cards where the PCIe cards are installed may be removed from the CPU drawer.

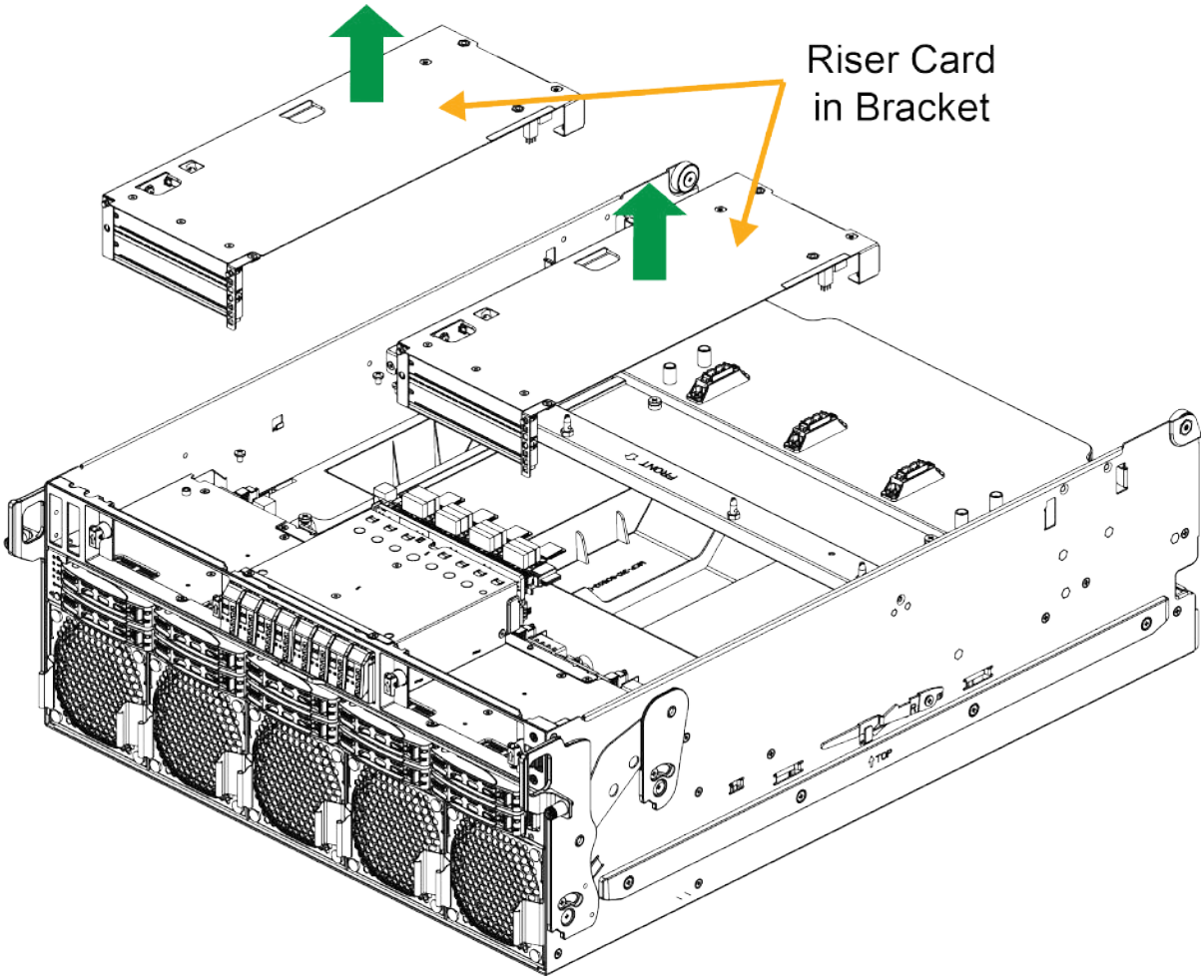


Figure 3-55. BF3 Riser Bracket with the Riser Card

Exploded View

Exploded view of the riser card in relation to the BF3 riser bracket or cage.

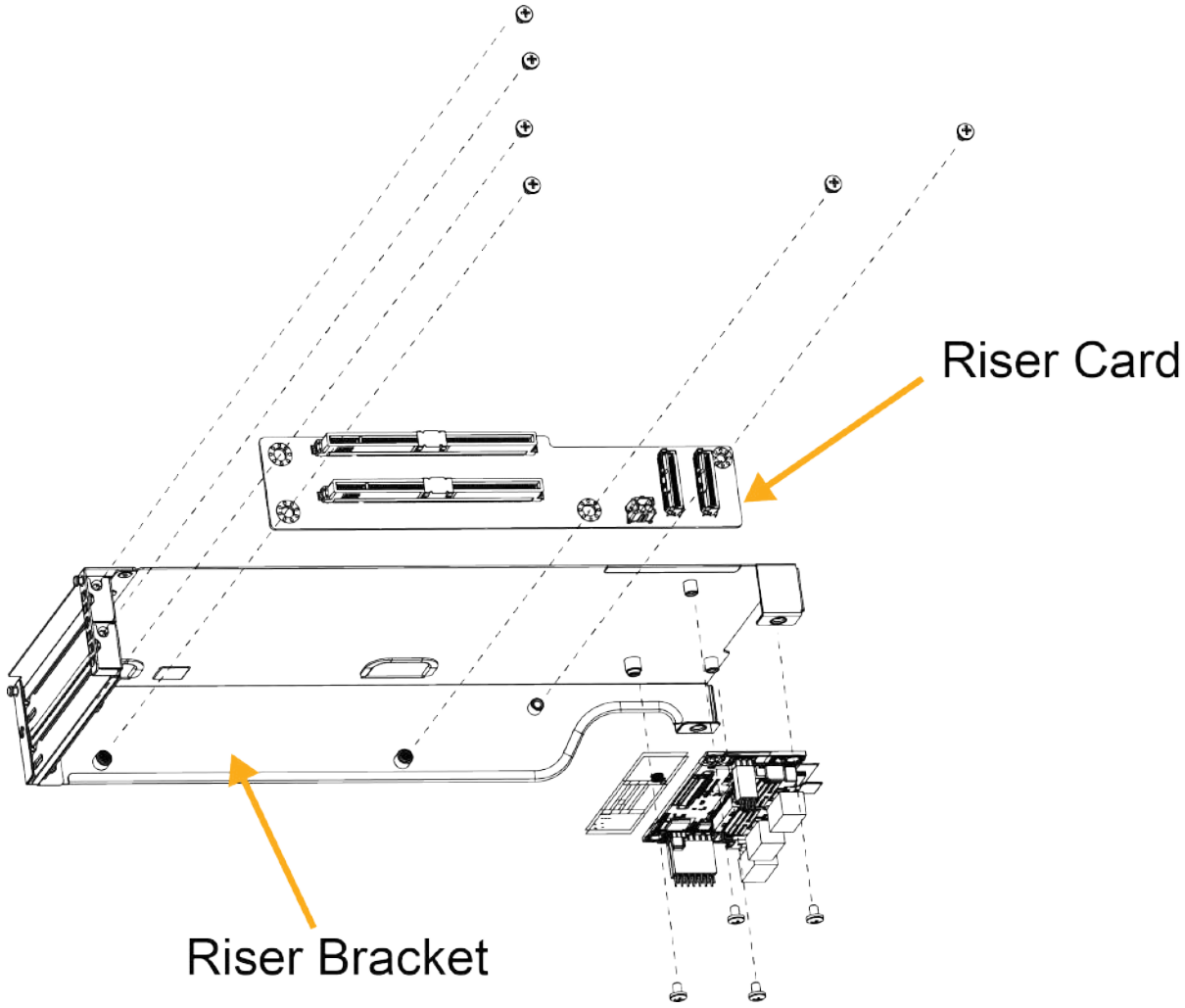


Figure 3-56. Exploded View of the Riser Card

3.11 Power Supply

The SYS-A22GA-NBRT includes six hot-plug power supply modules. These modules will automatically sense and operate at an input voltage between 100–240 V. 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.

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	On
Power supply warning events where the power supply continues to operate; high temperature; over voltage; under voltage, etc.	Off	1 Hz Blinking
AC present only 12 VSB ON (PS OFF)	1 Hz Blinking	Off
Output ON and OK	On	Off
AC cord unplugged and in redundant mode	Off	On

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.

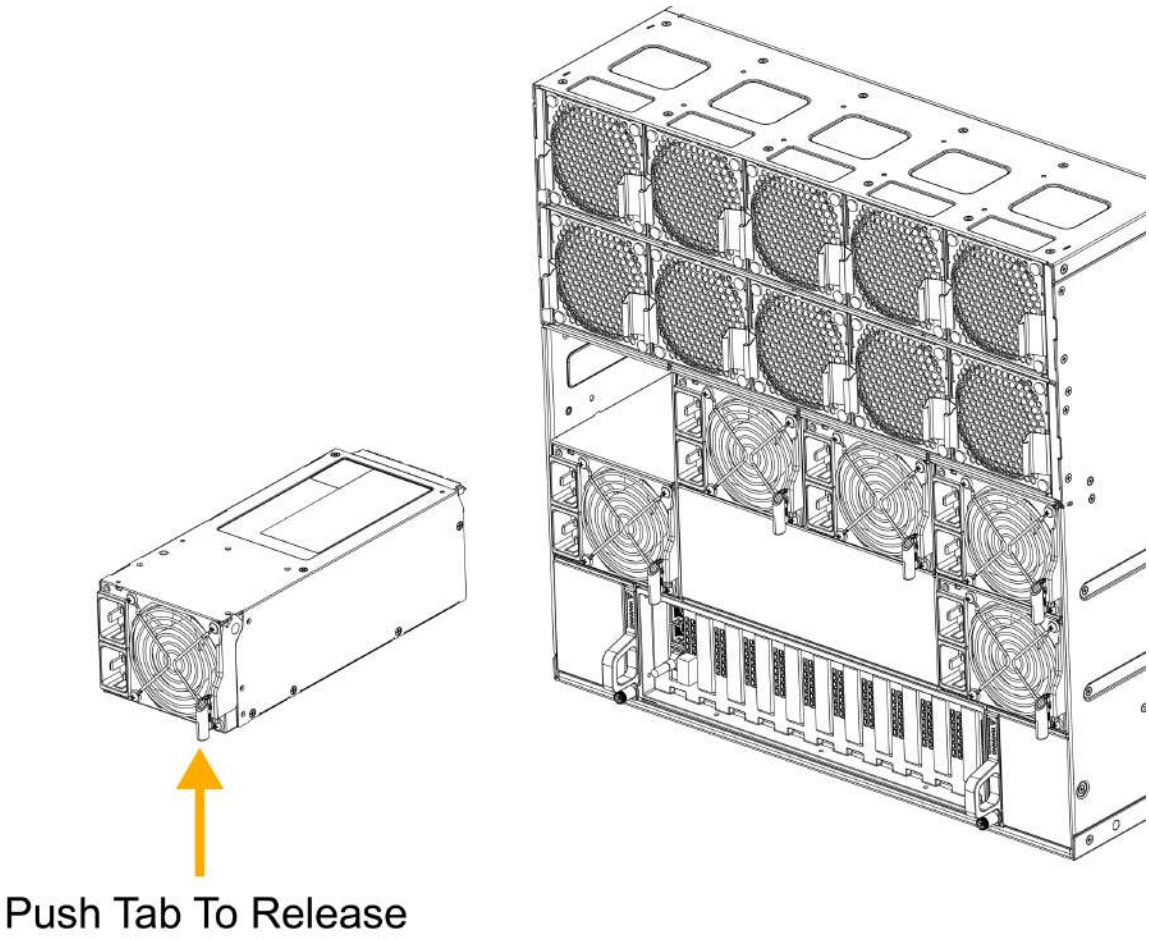


Figure 3-57. Installing a Power Supply Module

Chapter 4:

Motherboard Connections, Jumpers, and LEDs

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 the "Introduction" on page 12. More detail can be found in the MBD-X14DBG-DAP motherboard manual.

Review the "Standardized Warning Statements for AC Systems" on page 176 before installing or removing components.

4.1 Power Supply and Power Connections

For information about the power supply and power connections of the SYS-A22GA-NBRT server, refer to the following content.

Power Supply Connections

Important: To provide adequate power to your system, be sure to connect the main power supplies (JSW_PWR1/JSW_PWR2/JSW_PWR3) to the power supply. Failure to do so may void the manufacturer warranty on your power supply and motherboard.

Three main power connections, located at JSW_PWR/JSW_PWR2/JSW_PWR3 on the MBD-X14DBG-DAP motherboard, provide main power to your system. All these power connections meet the ATX SSI EPS 12 V specification and must be connected to your power supply to provide adequate power to your system.

For a detailed diagram of the MBD-X14DBG-DAP motherboard, see the layout under "Motherboard Quick Reference" on page 24.

4.2 Headers and Connections

For information about the headers on the MBD-X14DBG-DAP motherboard, refer to the following content.

CPLD Connectors

JCPLD1/JCPLD2 provide access to the motherboard complex programmable logic device (CPLD).

MCIO PCIe 5.0 x8 Connectors

Mini Cool Edge IO (MCIO) PCIe 5.0 x8 connectors are located at EJNVME1–EJNVME5 on the MBD-X14DBG-DAP motherboard.

For a detailed diagram of the MBD-X14DBG-DAP motherboard, see the layout under "Motherboard Quick Reference" on page 24.

MCIO PCIe 5.0 x16 Connectors

Mini Cool Edge IO (MCIO) PCIe 5.0 x16 connectors are located at EJBF3_1A, EJBF3_1B, EJBF3_2A, and EJBF3_2B on the MBD-X14DBG-DAP motherboard.

For a detailed diagram of the MBD-X14DBG-DAP motherboard, see the layout under "Motherboard Quick Reference" on page 24.

Fan Headers

There are seven 6-pin fan headers (FAN1–FAN5) on the MBD-X14DBG-DAP motherboard. However, fan speed control is available for all fans by Thermal Management via the IPMI 2.0 interface.

6-pin Fan Header Pin Definitions: Six Total			
Pin#	**Definition**	**Pin#**	**Definition**
1	GND	4	+12 V
2	+12 V	5	Tachometer
3	GND	6	PWM

NVMe SMBus Header

An NVMe SMBus (I²C) header is located at JNVI2C1 on the MBD-X14DBG-DAP motherboard. It is used for PCIe SMBus clock and data connections, provides hot-plug support through a dedicated SMBus interface. This feature is only available for a Supermicro complete system with a Supermicro proprietary NVMe add-on card and a proper cable installed.

For a detailed diagram of the MBD-X14DBG-DAP motherboard, see the layout under "Motherboard Quick Reference" on page 24.

NVMe SMBus Header Pin Definitions: Four Total	
Pin#	**Definition**
1	Data
2	GND
3	Clock
4	VCCIO

TPM/Port 80 Header

The JTPM1 header on the MBD-X14DBG-DAP motherboard is used to connect a Trusted Platform Module (TPM)/Port 80, which is available from Supermicro (optional). A TPM/Port 80 connector is a security device that supports encryption and authentication in storage drives. It allows the motherboard to deny access if the TPM associated with the storage drive is not installed in the system. Information on the TPM is available at the following page:

https://www.supermicro.com/manuals/other/AOM-TPM-9670V_9670H__X12_H12.pdf

For a detailed diagram of the MBD-X14DBG-DAP motherboard, see the layout under "Motherboard Quick Reference" on page 24.

Trusted Platform Module Header Pin Definitions: 10 Total			
Pin#	**Definition**	**Pin#**	**Definition**
1	+3.3 V	2	SPI_CS#
3	RESET#	4	SPI_MISO
5	SPI_CLK	6	Ground
7	SPI_MOSI	8	No Connection
9	+1.8 V Standby	10	SPI_IRQ#

External BMC I²C Header

A System Management Bus header for the BMC is located at JIPMB1 on the MBD-X14DBG-DAP motherboard. Connect the appropriate cable here to use the IPMB I²C connection on your system.

For a detailed diagram of the MBD-X14DBG-DAP motherboard, see the layout under "Motherboard Quick Reference" on page 24.

4.3 Control Panel

Refer to the following content for information about the front control panel header on the MBD-X14DBG-DAP motherboard.

Power On and BMC/BIOS Status LED Button

The Power On and BMC/BIOS Status LED button is located on pin 1 of the front control panel header located at JFP1 on the MBD-X14DBG-DAP motherboard. Momentarily contacting pin 1 of JFP1 will power on/off the system or display BMC/BIOS status.

For a detailed diagram of the MBD-X14DBG-DAP motherboard, see the layout under "Motherboard Quick Reference" on page 24.

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

UID LED

The unit identifier LED connection is located on pin 3 of JFP1 on the MBD-X14DBG-DAP motherboard.

For a detailed diagram of the MBD-X14DBG-DAP motherboard, see the layout under "Motherboard Quick Reference" on page 24.

Fail LED (Information LED for OH/FF/PF)

The Fail LED (Information LED for OH/Fan Fail/PWR Fail) connection, located on pin 4 of JFP1, provides warnings of overheating, power failure, or fan failure for the system.

For a detailed diagram of the MBD-X14DBG-DAP motherboard, see the layout under "Motherboard Quick Reference" on page 24.

Fail LED (Information LED) (OH/Fan Fail/PWR Fail) LED States	
Status	**Description**
Solid red (on)	An overheat condition has occurred.
Blinking red (1 Hz)	Fan failure: check for an inoperative fan.
Blinking red (0.25 Hz)	Power failure: check for a non-operational power supply.
Blinking red (10 Hz) (FP red LED)	CPLD recovery mode error(s).
Solid blue	UID has been activated locally. Use this function to locate a unit in the system that might be in need of service.
Blinking blue (1 Hz)	Local UID has been activated locally on. Use this function to identify a unit that might be in need of service.
BIOS/BMC blinking blue (10 Hz)	BIOS/BMC: recovery and/or update in progress.
Red Info LED blinking (10 Hz) and MB UID LED blue blinking (10 Hz)	CPLD: recovery and/or update in progress.

LAN1/LAN2 (NIC1/NIC2) LED

The Network Interface Controller (NIC) LED connection for LAN Port 1 is located on pin 6 of JFP1 on the MBD-X14DBG-DAP motherboard, and LAN Port 2 is on pin 5.

For a detailed diagram of the MBD-X14DBG-DAP motherboard, see the layout under "Motherboard Quick Reference" on page 24.

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

Standby Power LED

The LED indicator for standby power is located on pin 8 of JFP1 on the MBD-X14DBG-DAP motherboard. If this LED is on, standby power is on.

For a detailed diagram of the MBD-X14DBG-DAP motherboard, see the layout under "Motherboard Quick Reference" on page 24.

Root of Trust (RoT) Power LED

The Power LED for the Root of Trust (RoT) connection is located on pin 9 of JFP1 on the MBD-X14DBG-DAP motherboard. If this LED is on, power for the RoT chip is on.

For a detailed diagram of the MBD-X14DBG-DAP motherboard, see the layout under "Motherboard Quick Reference" on page 24.

Standby Power

A Standby Power (I²C) connection is located on pins 10–14 of JFP1 on the MBD-X14DBG-DAP motherboard to provide power to the system when it is in standby mode.

For a detailed diagram of the MBD-X14DBG-DAP motherboard, see the layout under "Motherboard Quick Reference" on page 24.

+3.3 V Standby Power

Pin Definitions: Five Total

Pin#	Definition
10	+3.3 Standby
11	Ground
12	I²C Data
13	I²C Clock
14	Ground

Power Fail LED Indicators

Power Failure LED Indicators are located on pins 15 and 19 of JFP1 on the MBD-X14DBG-DAP motherboard.

For a detailed diagram of the MBD-X14DBG-DAP motherboard, see the layout under "Motherboard Quick Reference" on page 24.

FP Power LED

Pin Definitions (JFP1)

Pin#	Definition
15	PWR Failure LED-Positive
19	PWR Failure LED-Negative

4.4 I/O Ports

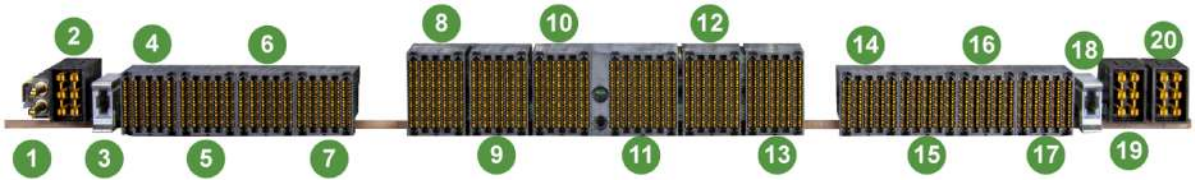


Figure 4-1. MBD-X14DBG-DAP I/O Ports

I/O Ports			
Item	**Description**	**Item**	**Description**
1	EJSW_P5	11	Internal Connection
2	Main Power Connection from Midplane to Motherboard	12	Internal Connection
3	Internal Connection	13	Internal Connection
4	Internal Connection	14	Internal Connection
5	Internal Connection	15	Internal Connection
6	Internal Connection	16	Internal Connection
7	Internal Connection	17	Internal Connection
8	Internal Connection	18	Internal Connection
9	Internal Connection	19	Main Power Connection from Midplane to Motherboard
10	Internal Connection	20	Main Power Connection from Midplane to Motherboard

4.5 Jumper Settings

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.

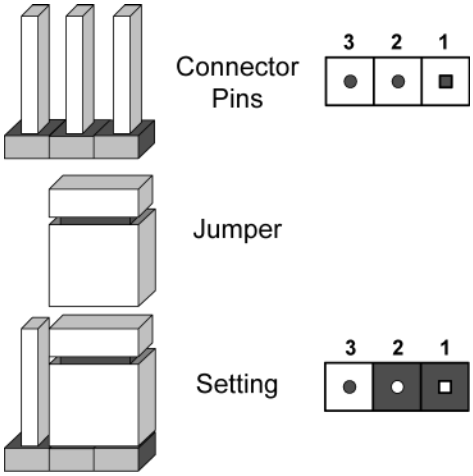


Figure 4-2. Jumping Connector Pins

4.6 LED Indicators

For information about the LED indicators on the SYS-A22GA-NBRT server, refer to the following content.

Onboard Power LED

The Onboard Power LED is located at LEDPWR1 on the MBD-X14DBG-DAP motherboard. When this LED is on, the system is on. Be sure to turn off the system and unplug the power cord before removing or installing components.

For a detailed diagram of the MBD-X14DBG-DAP motherboard, see the layout under "Motherboard Quick Reference" on page 24.

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

Chapter 5:

Software

After the SYS-A22GA-NBRT server 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 https://www.supermicro.com/support/manuals.

Installing the OS

1. Create a method to access the Microsoft Windows installation ISO file. That can be a USB flash or media drive, or the BMC KVM console.
2. Retrieve the proper drivers. 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 bootup.

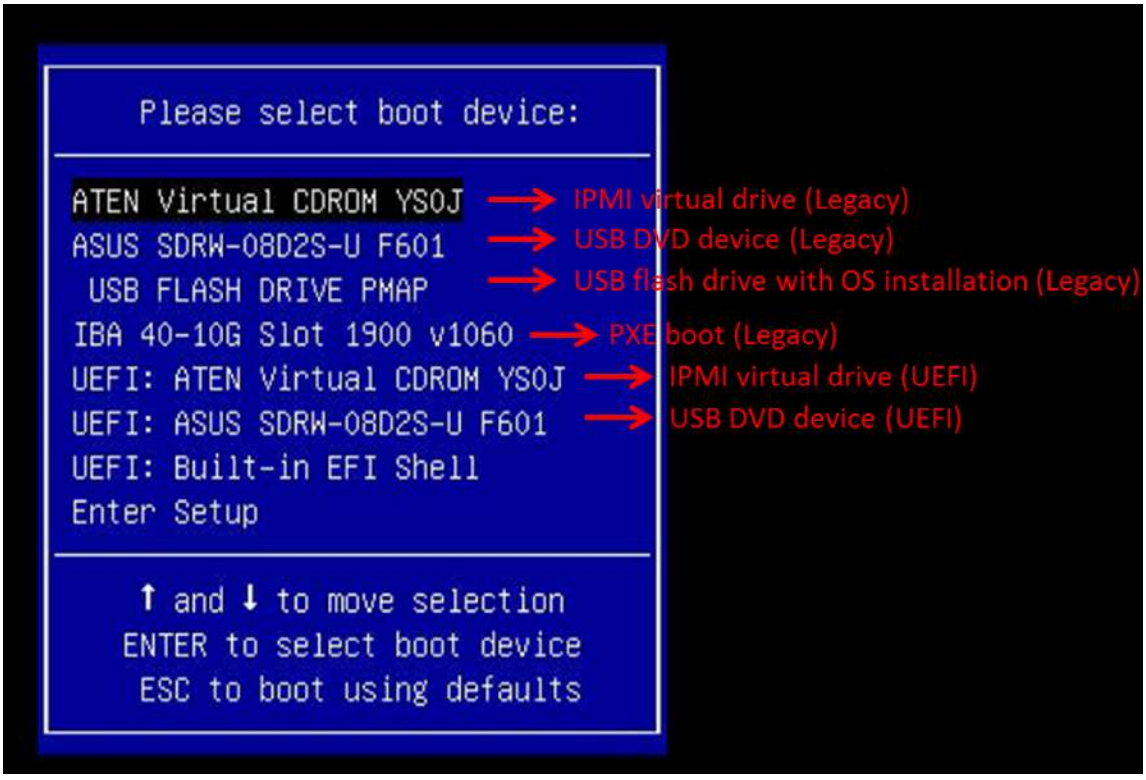


Figure 5-1. Selecting the Boot Device

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

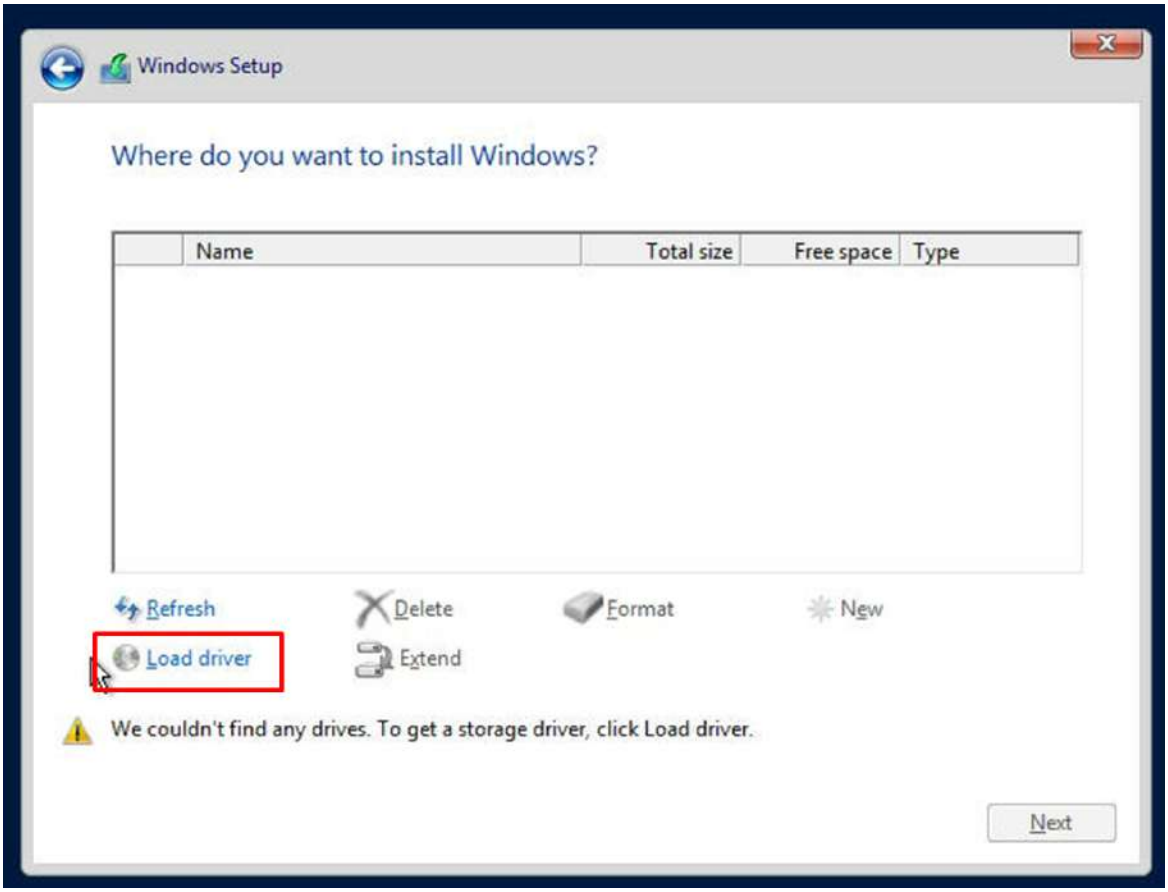


Figure 5-2. Loading the Driver Link

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

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

5.2 Driver Installation

The Supermicro website contains drivers and utilities for your system at the following page:

https://www.supermicro.com/wdl.

Some of these drivers and utilities must be installed, such as the chipset driver. After accessing the website, go into the CDR_Images (in the parent directory of the above link) and locate the ISO file for your motherboard. Download this file to a USB flash or media drive. You may also use a utility to extract the ISO file if preferred.

Another option is to go to the Supermicro website at https://www.supermicro.com. 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.

Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to 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 contents.

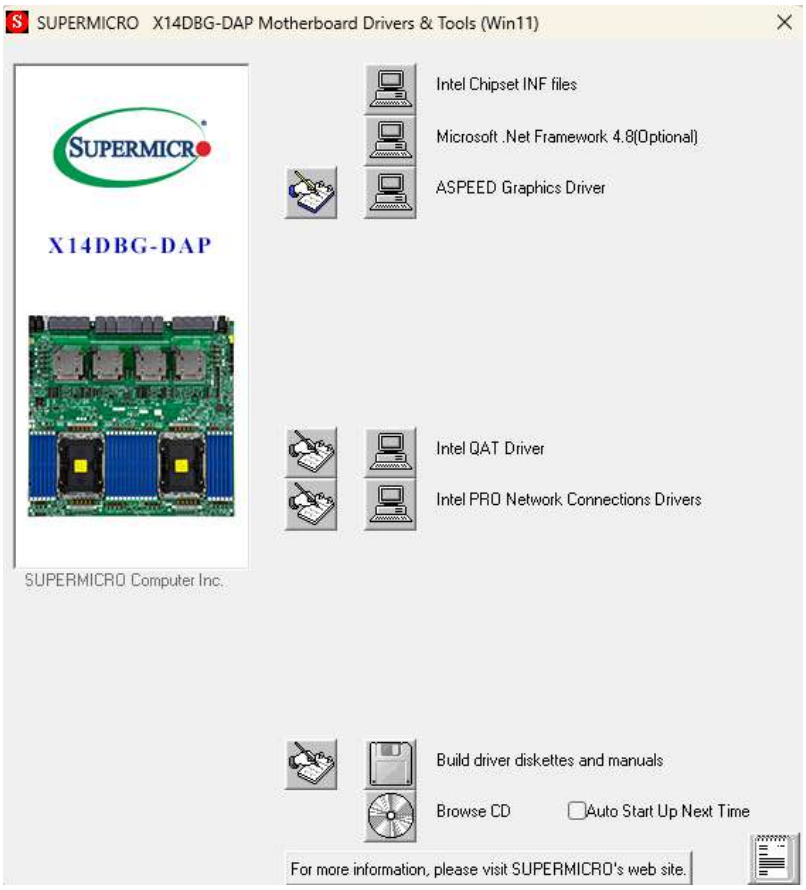


Figure 5-3. Drivers & Tools Installation Screen

5.3 BMC

The MBD-X14DBG-DAP 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 the following page:

https://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. The password can be found on a sticker on the motherboard and a sticker on the chassis, for Supermicro chassis. The sticker also displays the BMC MAC address. If necessary, the password can be reset using the Supermicro IPMICFG tool.

Figure 5-4. BMC Password Label

Chapter 6:

Optional Components

This chapter describes alternate configurations and optional system components for the SYS-A22GA-NBRT server.

6.1 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 MBD-X14DBG-DAP motherboard to deny access if the TPM associated with the hard drive is not installed in the SYS-A22GA-NBRT server.

For details and installation procedures, refer to the following page:

https://www.supermicro.com/en/products/accessories/addon/AOM-TPM-9672V.php

- AOM-TPM-9672V (TCG 2.0)

Chapter 7:

Troubleshooting and Support

The following content contains information on common issues and how to resolve them.

7.1 Online Resources

A great deal of information is available on the Supermicro website. From the top menu of the Supermicro home page at https://www.supermicro.com:

- 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-A22GA-NBRT System

SYS-A22GA-NBRT Specifications Page:

https://www.supermicro.com/en/products/system/gpu/10u/sys-a22ga-nbrt

Direct Links for General Support and Information

Tested Memory List

- Frequently Asked Questions: https://www.supermicro.com/FAQ/index.php
- TPM User Guide: https://www.supermicro.com/manuals/other/AOM-TPM-9670V_9670H__X12_H12.pdf
- BMC User Guide: https://www.supermicro.com/manuals/other/BMC_IPMI_X14_H14.pdf
- Product Resources page for validated memory details: https://www.supermicro.com/support/resources/mem.cfm
- Product Matrices page for links to tables summarizing specs for systems, motherboards, power supplies, riser cards, add-on cards, and more: https://www.supermicro.com/en/support/product-matrices
- Security Center for recent security notices: https://www.supermicro.com/en/support/security_center
- Supermicro Phone and Addresses: https://www.supermicro.com/en/about/contact

7.2 Baseboard Management Controller (BMC)

The SYS-A22GA-NBRT server supports the Baseboard Management Controller (BMC). BMC is used to provide remote access, monitoring, and management. There are several BIOS settings that are related to BMC.

For general documentation and information on BMC, visit our website at the following page:

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

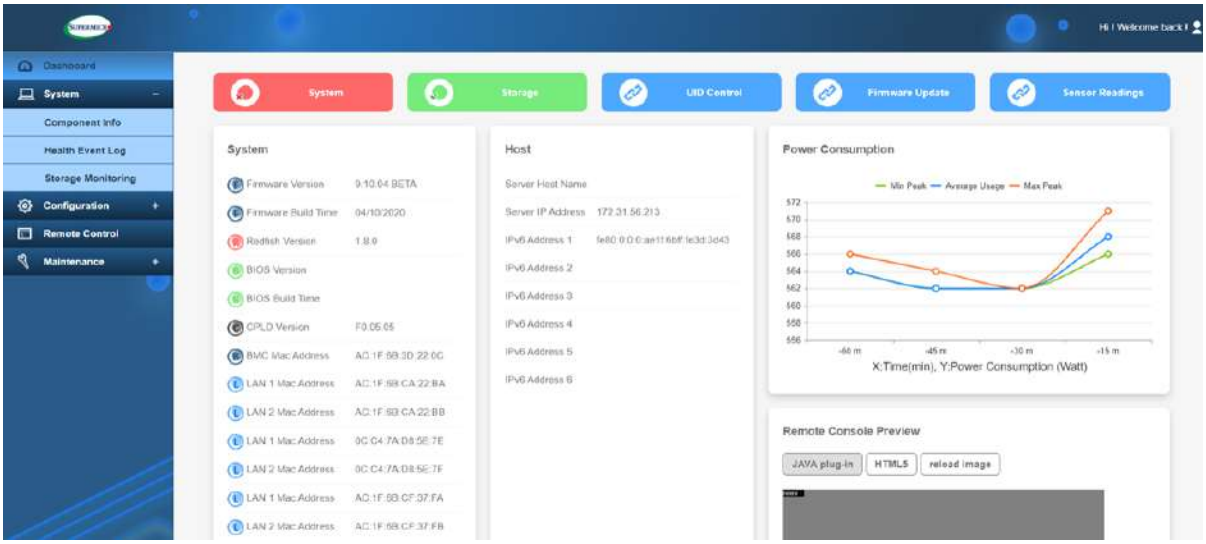


Figure 7-1. BMC Dashboard

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" on page 123 section in this chapter. Always disconnect the AC power cord before adding, changing or installing any non hot-swap hardware components. If the below steps do not fix the setup configuration problem, contact your vendor for repairs.

Before Power On

1. Make sure that there are no short circuits between the motherboard and chassis.
2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.
3. Remove all add-on cards.
4. Install the processor (making sure it is fully seated) and connect the front panel connectors to the motherboard.

No Power

1. Make sure that there are no short circuits between the motherboard and the chassis.
2. The battery on your motherboard may be old. Check to verify that it still supplies approximately 3 VDC. If it does not, replace it with a new one.

No Video

1. If the power is on, but you do not have video, remove all add-on cards and cables.
2. Remove all memory modules and turn on the system (if the alarm is on, check the specs of memory modules, reset the memory, or try a different one).

System Boot Failure

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

1. Remove all components from the motherboard, especially the DIMMs. Power on the system and check if the power-on LED and the BMC Heartbeat LED are on, and system fans are spinning.

2. Turn on the system with only one DIMM installed. If the system boots, check for bad DIMMs or slots by following the Memory Errors Troubleshooting procedure in this chapter.

Memory Errors

When suspecting faulty memory is causing the system issue, check the following:

1. Make sure that the memory modules are compatible with the system and are properly installed. See "Maintenance and Component Installation" on page 40 for installation instructions. (For memory compatibility, refer to the "Tested Memory List" link on the motherboard's product page to see a list of supported memory.)
2. Check if different speeds of DIMMs have been installed. It is strongly recommended that you use the same RAM type and speed for all DIMMs in the system.
3. Make sure that you are using the correct type of DIMMs recommended by the manufacturer.
4. Check for bad DIMMs or slots by swapping a single module among all memory slots and check the results.

Losing the System's Setup Configuration

1. Make sure that you are using a high-quality power supply. A poor-quality power supply may cause the system to lose the CMOS setup information. Refer to "Introduction" on page 12 for details on recommended power supplies.
2. The battery on your motherboard may be old. Check to verify that it still supplies approximately 3 VDC. If it does not, replace it with a new one.

If the System Becomes Unstable

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

1. Processor/BIOS support: Make sure that your processor is supported and that you have the latest BIOS installed in your system.
2. Memory support: Make sure that the memory modules are supported. Refer to the product page on our website at https://www.supermicro.com. Test the modules using memtest86 or a similar utility.

   Note: Click on the "Tested Memory List" link on the motherboard's product page to see a list of supported memory.

3. Storage Drive support: Make sure that all storage drives work properly. Replace the failed storage drives with good ones.
4. System cooling: Check the system cooling to make sure that all heatsink fans and processor/system fans, etc., work properly. Check the hardware monitoring settings in the BMC to make sure that the processor and system temperatures are within the normal range. Also, check the front panel Overheat LED and make sure that it is not on.
5. Adequate power supply: Make sure that the power supply provides adequate power to the system. Make sure that all power connectors are connected. Refer to our website for more information on the minimum power requirements.
6. Proper software support: Make sure that the correct drivers are used.

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

1. Source of installation: Make sure that the devices used for installation are working properly, including boot devices such as a CD/Media drive.
2. Cable connection: Check to make sure that all cables are connected and working properly.
3. Use the minimum configuration for troubleshooting: Remove all unnecessary components (starting with add-on cards first), and use the minimum configuration (but with the processor and a memory module installed) to identify the trouble areas. Refer to the steps listed above in this section for proper troubleshooting procedures.
4. Identify bad components by isolating them: If necessary, remove a component in question from the chassis, and test it in isolation to make sure that it works properly. Replace a bad component with a good one.
5. Check and change one component at a time instead of changing several items at the same time. This will help isolate and identify the problem.
6. To find out if a component is good, swap this component with a new one to see if the system will work properly. If so, then the old component is bad. You can also install the component in question in another system. If the new system works, the component is good and the old system has problems.

7.4 CMOS Clear

JBT1 on the MBD-X14DBG-DAP motherboard is used to clear CMOS, which will also clear any passwords. For information on clearing CMOS, refer to CMOS Clear earlier in this manual.

7.5 Motherboard Battery

For information on removing, disposing of, and replacing the motherboard battery of your system, refer to "Motherboard Battery Removal and Installation" on page 77.

7.6 Where to Get Replacement Components

If you need replacement parts for your SYS-A22GA-NBRT server, 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 on the Supermicro website:

https://www.supermicro.com

Under the "Buy" menu, click the "Where to Buy" link.

7.7 Technical Support Procedures

Before contacting Technical Support, take the following steps. Also, note that as a motherboard manufacturer, Supermicro also sells motherboards through its channels, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problems with the specific system configuration that was sold to you.

1. Refer to "Troubleshooting Procedures" on page 117 or see the FAQs on our website (https://www.supermicro.com/FAQ/index.php) before contacting Technical Support.
2. BIOS upgrades can be downloaded from our website (https://www.supermicro.com/support/resources/bios_ipmi.php).
3. If you still cannot resolve the problem, include the following information when contacting Supermicro for technical support:
   - Motherboard model and PCB revision number
   - BIOS release date/version (This can be seen on the initial display when your system first boots up.)
   - System configuration
4. An example of a Technical Support form is on our website at https://webpr3.supermicro.com/SupportPortal.
5. Distributors: For immediate assistance, have your account number ready when placing a call to our Technical Support department. For Supermicro contact information, refer to "Contacting Supermicro" on page 11.

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 the server to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and the shipping package is 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 can be requested online at the following page:

https://www.supermicro.com/RmaForm

Whenever possible, repack the server in the original Supermicro carton, using the original packaging material. If these are no longer available, be sure to pack the server securely, using packaging material to surround the server 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 alternation, misuse, abuse or improper maintenance of products.

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

7.8 Feedback

Supermicro values your feedback as we strive to improve our customer experience in all facets of our business. Email us at Techwriterteam@supermicro.com to provide feedback on our manuals.

Chapter 8:

UEFI BIOS

The following content contains information on BIOS configuration with the SYS-A22GA-NBRT server.

8.1 Introduction

This chapter describes the AMIBIOS™ Setup utility for the motherboard. The BIOS is stored on a chip and can be easily upgraded using the UEFI script (flash.nsh), the BMC WebUI, or the SuperServer Automation Assistant (SAA) utility.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Refer to the Manual Download area of our website for any changes to BIOS that may not be reflected in this manual.

Updating BIOS

It is recommended that you do not upgrade your BIOS if you are not experiencing any problems with your system. Updated BIOS files are located on our website at the following page:

https://www.supermicro.com/support/resources/bios_ipmi.php

Check our BIOS warning message and the information on how to update your BIOS on our website. Select your motherboard model and download the BIOS file to your computer. Also, check the current BIOS revision to make sure that it is newer than your BIOS before downloading.

Important: Do not shut down or reset the system while updating the BIOS to prevent possible system boot failure! Read the motherboard README file carefully before you perform the BIOS update.

To update the BIOS under the UEFI Shell, unzip the BIOS file onto a bootable USB device and then boot into the built-in UEFI Shell. For motherboards with BMC support, type "flash.nsh <BIOS filename><BMC Username><BMC Password>" to start the BIOS update. The flash.nsh script will invoke the SAA (EFI) tool automatically to perform the BIOS update, beginning with uploading the BIOS image to BMC. After uploading the BIOS image, the system will reboot to continue the process. The BMC will take over and continue the BIOS update in the background. The process will take 3–5 minutes. Refer to the README file for more information.

Starting the Setup Utility

To enter the BIOS Setup utility, press the <Delete> key while the system is booting-up. In most cases, the <Delete> key is used to invoke the BIOS Setup screen. There are a few cases when other hot keys are used, such as <F1>, <F2>, etc. Each main BIOS menu option is described in this manual.

The Main BIOS screen has two main frames. The left frame displays all the options that can be configured. “Grayed-out” options cannot be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When a BIOS submenu or item is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (Note that BIOS has default text messages built in. We retain the option to include, omit, or change any of these text messages.) Settings printed in Bold are the default values.

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

The BIOS Setup utility uses a key-based navigation system called hot keys. Most of these hot keys (<F1>, <F2>, <F3>, <F4>, <F5>, <F6>, <Enter>, <ESC>, the arrow keys, etc.) can be used at any time during the setup navigation process.

8.2 Main Setup

The Main setup screen appears when the AMI BIOS Setup utility is first entered. To return to the Main setup screen, select the Main tab at the top of the screen. The Main BIOS setup screen is shown below.

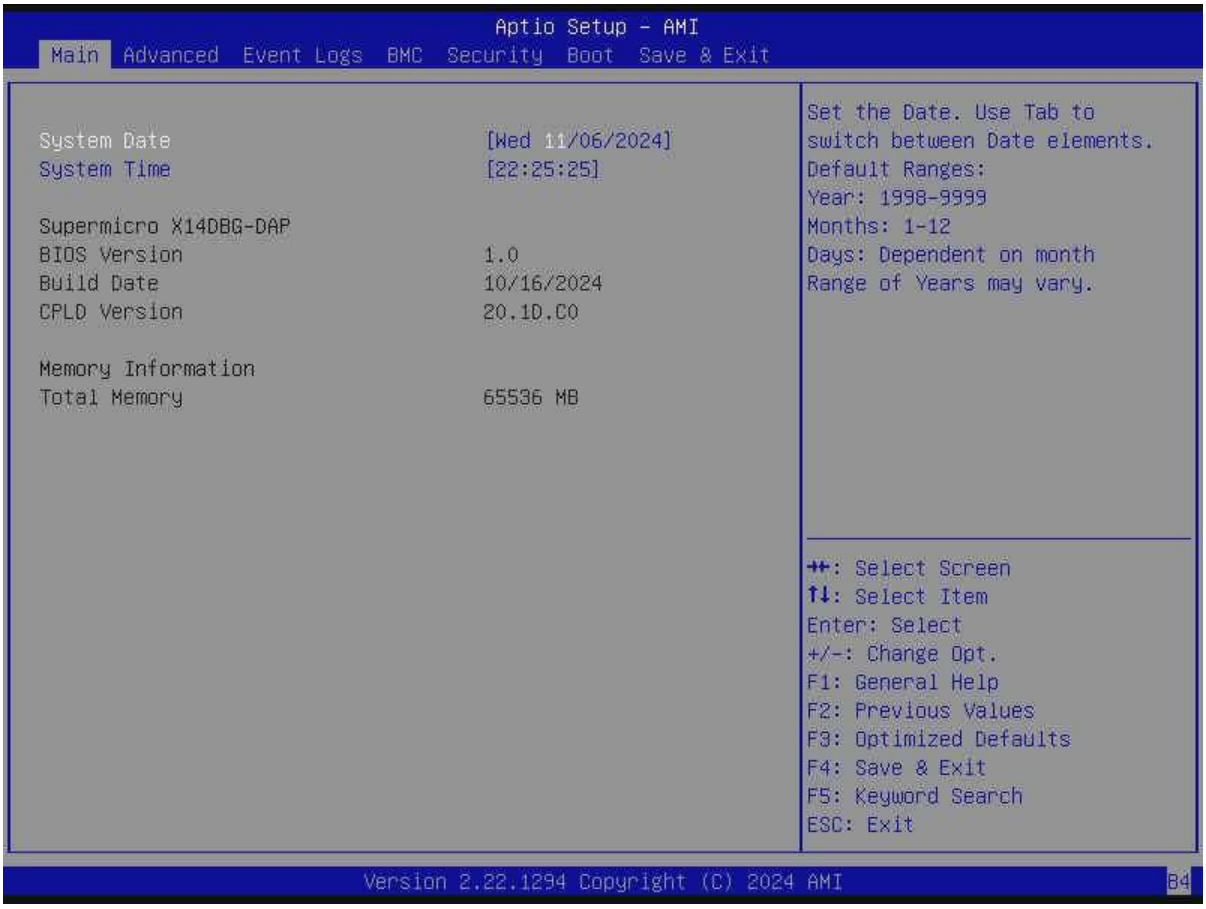


Figure 8-1. Main Setup Page

System Date/System Time

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

Note: The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.

Supermicro MBD-X14DBG-DAP

BIOS Version

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

Build Date

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

CPLD Version

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

Memory Information

Total Memory

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

8.3 Advanced Setup Configurations

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

Important: Use caution when changing the Advanced settings. An incorrect value, an improper DRAM frequency, or a wrong BIOS timing setting may cause the system to malfunction. When this occurs, revert the settings to the default manufacturing settings.

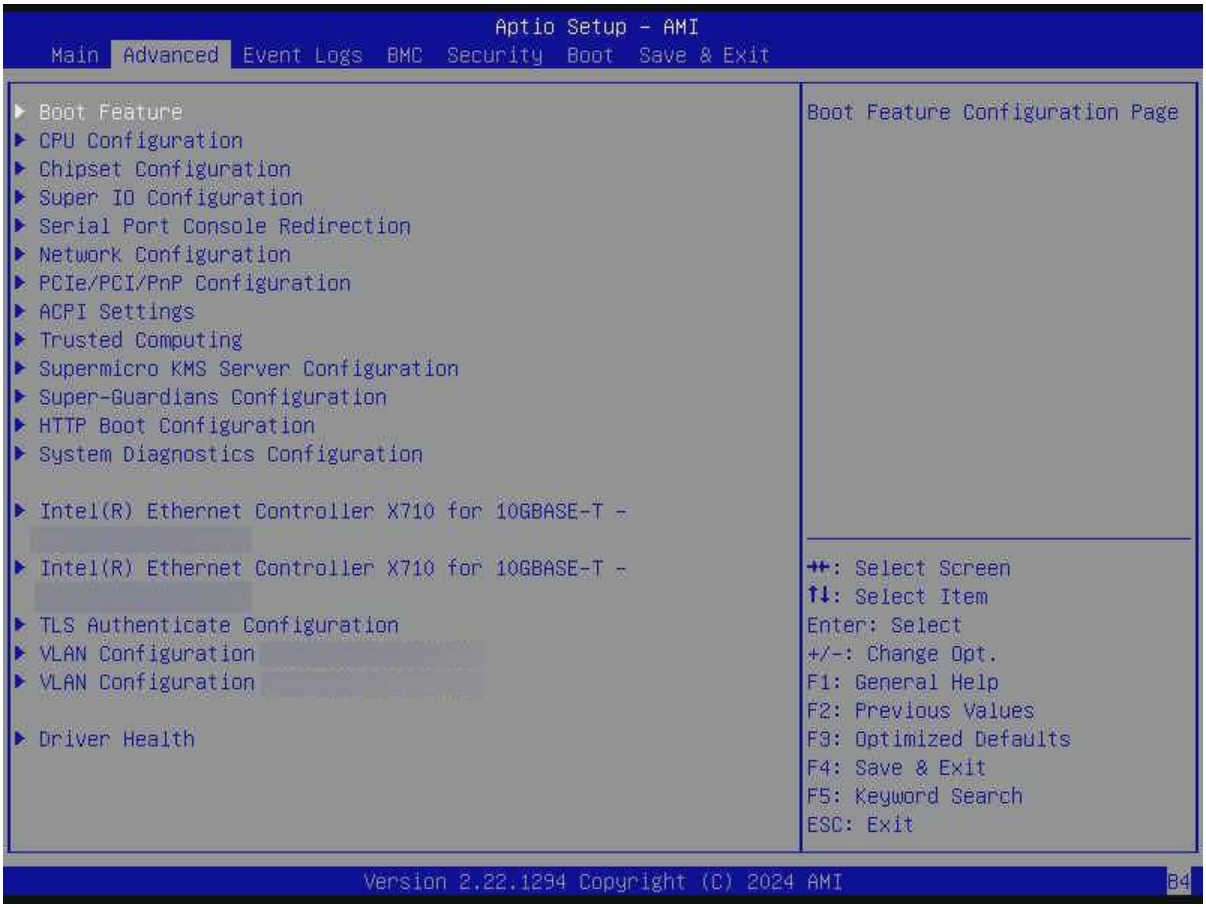


Figure 8-2. Advanced Setup Page

Boot Feature Menu

►Boot Feature

Quiet Boot

Use this feature to select the screen between displaying the Power-on Self Test (POST) messages or the OEM logo upon bootup. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options

are Disabled and **Enabled**.

Note: BIOS POST messages are always displayed regardless of the setting of this feature.

Bootup NumLock State

Use this feature to set the power on state for the <Num Lock> key. The options are **On** and Off.

Wait For "F1" If Error

Select Enabled to force the system to wait until the <F1> key is pressed if an error occurs. The options are **Disabled** and Enabled.

Re-try Boot

If this feature is set to Enabled, the system BIOS will automatically reboot the system from an Extensible Firmware Interface (EFI) boot device after an initial boot failure. The options are **Disabled**, Legacy Boot, and EFI Boot.

Power Configuration

Watch Dog Function

Select Enabled to allow the Watchdog timer to reboot the system when it is inactive for more than five minutes. The options are **Disabled** and Enabled.

Watch Dog Action (Available when "Watch Dog Function" is set to Enabled)

Use this feature to configure the Watchdog timeout setting. The options are **Reset** and NMI.

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Stay Off for the system power to remain off after a power loss. Select Power On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last power state before a power loss. The options are Stay Off, Power On, and **Last State**.

Power Button Function

This feature controls how the system shuts down when the power button is pressed. Select 4 Seconds Override to power off the system after pressing and holding the power button for four seconds or longer. Select Instant Off to instantly power off the system as soon as you press the power button. The options are **Instant Off** and 4 Seconds Override.

CPU Configuration Menu

►CPU Configuration

Important: Setting the wrong values for the features included in the following sections may cause the system to malfunction.

The following processor information is displayed:

- Processor BSP Revision
- Processor Socket
- Processor ID
- Processor Frequency
- Processor Max Ratio
- Processor Min Ratio
- Microcode Revision
- L1 Cache RAM (Per Core)
- L2 Cache RAM (Per Core)
- L3 Cache RAM (Per Package)
- Processor 0 Version

Hyper-Threading [ALL]

Select Enabled to use Intel Hyper-Threading Technology to enhance CPU performance. The options are Disabled and **Enabled**. This feature is CPU-dependent.

Hardware Prefetcher

If this feature is set to Enabled, the hardware prefetcher will prefetch data from the main system memory to Level 2 cache to help expedite the data transaction to enhance memory performance. The options are **Enabled** and Disabled.

Note: This feature is NOT available when "Workload Profile" is set to HPC, I/O, or Virtualization.

Adjacent Cache Prefetch

Select Enabled for the CPU to prefetch both cache lines for 128 bytes as comprised. Select Disabled for the CPU to prefetch both cache lines for 64 bytes. The options are **Enabled** and Disabled.

Note: This feature is NOT available when "Workload Profile" is set to HPC, I/O, or Virtualization.

DCU Streamer Prefetcher

If this feature is set to Enabled, the Data Cache Unit (DCU) streamer prefetcher will prefetch data streams from the cache memory to the DCU to speed up data accessing and processing to enhance CPU performance. The options are Enabled, Disabled, and **Auto**.

Note: This feature is NOT available when "Workload Profile" is set to HPC, I/O, or Virtualization.

DCU IP Prefetcher

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

Note: This feature is NOT available when "Workload Profile" is set to HPC, I/O, or Virtualization.

LLC Prefetch

If this feature is set to Enabled, LLC (hardware cache) prefetching on all threads will be supported. The options are **Disabled** and Enabled. This feature is CPU-dependent.

Note: This feature is NOT available when "Workload Profile" is set to HPC, I/O, or Virtualization.

Homeless Prefetch

Select Enabled for Homeless Prefetch support on all threads, which is an Effective Prefetch Strategy (EPS) used to enhance memory performance by reducing communication overhead, network latency, and the wait time needed for barrier synchronization in memory prefetching commonly associated with the home-based software Distributed Shared Memory (DSM) system. The options are Disabled, Enabled, and **Auto**. Please note that the option of Auto is program-specific. This feature is CPU-dependent.

AMP Prefetch

Select Enabled to use a machine learning algorithm to predict the best L2 prefetcher configuration for the currently running workload. This feature can improve the performance of various general-purpose workloads. The options are Disabled and **Enabled**. This feature is CPU-dependent.

APIC Physical Mode

Use this feature to enable the APIC physical destination mode. The options are **Disabled** and Enabled. (APIC is the abbreviation for Extended Advanced Programmable Interrupt Controller.)

TXT Support

Select Enabled to enable Intel Trusted Execution Technology (TXT) support to enhance system integrity and data security. The options are **Disabled** and Enabled. This feature is CPU-dependent.

Note: If this feature is set to Enabled, be sure to disable Device Function On-Hide (EV DFX) support when it is present in the BIOS for the system to work properly.

Intel Virtualization Technology

Select Enabled to enable the Intel Vanderpool Technology for Virtualization platform support, which allows multiple operating systems to run simultaneously on the same computer to maximize system resources for performance enhancement. The options are Disabled and **Enabled**. Changes take effect after you save settings and reboot the system.

Notes:

- This feature is NOT available when "TXT Support" is set to Enabled.
- This feature is NOT available when "Workload Profile" is set to Virtualization.

Enable SMX

Select Enabled to support Safer Mode Extensions (SMX), which provides a programming interface for system software to establish a controlled environment to support the trusted platform configured by the end user and to verify a virtual machine monitor before it is allowed to run. The options are **Disabled** and Enabled.

Note: This feature is available when "TXT Support" is set to Disabled.

PPIN Control

Select Unlock/Enabled to use the Protected Processor Inventory Number (PPIN) in the system. The PPIN is a unique number set for tracking a given Intel Xeon server processor. The options are Lock/Disabled and **Unlock/Enabled**.

AES-NI

Select Enabled to use the Intel Advanced Encryption Standard (AES) New Instructions (NI) to ensure data security. The options are Disabled and **Enabled**.

Chipset Configuration Menu

►Chipset Configuration

Important: Setting the wrong values in this section may cause the system to malfunction.

Uncore Configuration Menu

►Uncore Configuration

The following information is displayed.

- Number of CPU
- Current UPI Link Speed
- Current UPI Link Frequency
- Global MMIO Low Base / Limit
- Global MMIO High Base / Limit
- PCIe Configuration Base / Size

Degrade Precedence

Use this feature to select the degrading precedence option for Ultra Path Interconnect (UPI) connections. Select Topology Precedence to degrade UPI features if system options are in conflict. Select Feature Precedence to degrade UPI topology if system options are in conflict. The options are **Topology Precedence** and Feature Precedence.

Link L0p Enable

Select Enabled for the system BIOS to enable Link L0p support, which allows the CPU to reduce the UPI links from full width to half width in the event when the CPU's workload is low in an attempt to save power. This feature is available for the system that uses Intel processors with UPI technology support. The options are **Disabled**, Enabled, and Auto.

Note: You can change the performance settings for non-standard applications by using this parameter. It is recommended that the default settings be used for standard applications.

Link L1 Enable

Select Enabled for the BIOS to activate Link L1 support, which will power down the UPI links to save power when the system is idle. This feature is available for the system that uses Intel processors with UPI technology support. The options are **Disabled**, Enabled, and Auto.

Note: Link L1 is an excellent feature for an idle system. L1 is used during Package C-States when its latency is hidden by other components during a wakeup.

KTI Prefetch

Keizer Technology Interconnect (KTI) is also known as the Intel Ultra Path Interconnect (UPI) technology. Select Enabled for the KTI prefetcher to preload the L1 cache with data deemed relevant, which allows the memory read to start earlier on a DDR bus in an effort to reduce

latency. Select Auto for the KTI prefetcher to automatically preload the L1 cache with relevant data whenever it is needed. The options are Disabled, Enabled, and **Auto**.

IO Directory Cache (IODC)

This feature allows the IODC to generate snoops instead of generating memory lockups for remote IIO (InvItoM) and/or WCiLF (Cores). Select Auto for the IODC to generate snoops (instead of memory lockups) for WCiLF (Cores). The options are Disabled, **Auto**, Enable for Remote InvItoM Hybrid Push, Enable for Remote InvItoM AllocFlow, Enable for Remote InvItoM Hybrid AllocNonAlloc, and Enable for Remote InvItoM and Remote WCiLF.

SNC

Sub NUMA Clustering (SNC) is a feature that breaks up the Last Level Cache (LLC) into clusters based on address range. Each cluster is connected to a subset of the memory controller. Enable this feature to improve average latency and reduce memory access congestion for higher performance. The options are Disabled, Enabled, and **Auto**. This feature is CPU-dependent.

Note: This feature is NOT available when "Workload Profile" is set to I/O, Virtualization, or Telco FlexRAN.

XPT Prefetch

XPT Prefetch is a feature that speculatively makes a copy to the memory controller of a read request being sent to the LLC. If the read request maps to the local memory address and the recent memory reads are likely to miss the LLC, a speculative read is sent to the local memory controller. The options are Disabled, Enabled, and **Auto**.

Stale AtoS

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

LLC Dead Line Alloc

Select Enabled to optimally fill the dead lines in the LLC. The options are Disabled, **Enabled**, and Auto.

SLF Enable

Use this feature to send B2P command for Pcode SLF Enable programming. This is enabled by default for supported CPU type. The options are **Auto**, Disabled, and Enabled.

Memory Configuration Menu

►Memory Configuration

This submenu is used to configure the Integrated Memory Controller (IMC) settings.

Enforce DDR Memory Frequency POR

Select Enforce POR to enforce Plan of Record (POR) restrictions for DDR memory frequency and voltage programming. The options are **Enforce POR**, Enforce Stretch Goals, and Disabled.

Host Memory Frequency

Use this feature to set the maximum memory frequency for onboard memory modules. The options are **Auto**, 4800, 5200, 5600, 6000, 6400, and 7200. Note that the available options are CPU-dependent.

Global Scrambling

Select Enabled to enable data scrambling to enhance system performance and data integrity. The options are Disabled and **Enabled**.

Memory Topology Menu

►Memory Topology

This submenu displays the information of onboard memory modules as detected by the BIOS, for example:

P1-DIMMA1: 5600MT/s Hynix SRx8 16GB RDIMM

Memory Map Menu

►Memory Map

Intel(R) Flat Memory Mode Support

Enable this feature to allow hardware-managed data movement between DDR5 and CXL memory, making total memory capacity visible to your system. The options are **Disabled** and Enabled.

DDR CXL Heterogeneous Interleave Support

Select Enabled to support heterogeneous interleaving for physical DDR5 and CXL memory. The options are **Disabled** and Enabled.

Memory RAS Configuration Menu

►Memory RAS Configuration

Use this submenu to configure the memory mirroring, Reliability Availability Serviceability (RAS) settings.

Mirror Mode

Use this feature to configure the mirror mode settings for all 1LM/2LM memory modules in the system to create a duplicate copy of data stored in the memory to increase memory security. It will reduce the memory capacity into half. The options are **Disabled** and Full Mirror Mode.

Note: This feature is available when "UEFI ARM Mirror" is set to Disabled.

UEFI ARM Mirror

If this feature is set to Enabled, mirror mode configuration settings for UEFI-based Address Range memory will be enabled upon system boot. This will create a duplicate copy of data stored in the memory to increase memory security, but it will reduce the memory capacity into half. The options are **Disabled** and Enabled. The Address Range Mirroring (ARM) feature supports partial memory mirroring. This feature is CPU-dependent.

Note: This feature is available when "Mirror Mode" is set to Disabled.

Mirror TAD0

Use this feature to enable the mirror mode on the entire memory for Target Address Decoder 0 (TAD0). The options are **Disabled** and Enabled. This feature is CPU-dependent.

Note: This feature is available when "Mirror Mode" is set to Disabled.

ARM Mirror Percentage (Available when "UEFI ARM Mirror" is set to Enabled)

Use this feature to set the percentage of memory space to be used for UEFI ARM mirroring for memory security enhancement. The default setting is **2500**.

Correctable Error Threshold

Use this feature to specify the threshold value for correctable memory-error logging, which sets a limit on the maximum number of events that can be logged in the memory error log at a given time. The default setting is **512**.

Note: This feature is available when "Memory PFA Support" is set to Disabled.

Leaky Bucket Low Bit

Use this feature to set the Low Bit value for the Leaky Bucket algorithm, which is used to check the data transmissions between CPU sockets and the memory controller. The default setting is **12**.

Leaky Bucket High Bit

Use this feature to set the High Bit value for the Leaky Bucket algorithm, which is used to check the data transmissions between CPU sockets and the memory controller. The default setting is **13**.

ADDDC Sparing (Available when populating 1Rx4, 2Rx4, and 4Rx4 DIMMs and when "Memory PFA Support" is set to Disabled)

Select Enabled for Adaptive Double Device Data Correction (ADDDC) support, which will not only provide memory error checking and correction but will also prevent the system from issuing a performance penalty before a device fails. Note that virtual lockstep mode will only start to work for ADDDC after a faulty DRAM module is spared. The options are Disabled and **Enabled**.

DDR PPR Type

Post Package Repair (PPR) is a new feature available for the DDR4/DDR5 technology. PPR provides additional spare capacity within a DDR4/DDR5 DRAM module that is used to replace faulty cell areas detected during system boot. PPR offers two types of memory repairs. Soft Post Package Repair (sPPR) provides a quick, temporary fix on a raw element in a bank group of a DDR4/DDR5 DRAM device, while hard Post Package Repair (hPPR) will take a longer time to provide a permanent repair on a raw element. The options are PPR Disabled, **Hard PPR**, and Soft PPR.

Note: This feature is available when "Memory PFA Support" is set to Disabled.

Enhanced PPR

Use this feature to set advanced memory test. Select Enabled to always execute for every boot. The options are **Disabled**, Enabled, and Persistent.

Memory PFA Support (Available when the DCMS key is activated)

Select Enabled to enable memory Predictive Failure Analysis (PFA) support. PFA can be used to avoid uncorrectable faults on the same memory page. The options are **Disabled** and Enabled.

Security Configuration Menu

►Security Configuration

Memory Encryption (TME) [Outputs]

The following information is displayed.

- MSE activation state
- MK-TME activation state
- CI activation state
- Cryptographic Algorithm configured

Memory Encryption (TME) [Inputs]

Memory Encryption (TME)

Select Enabled for Intel Total Memory Encryption (TME) support to enhance memory data security. The options are **Disabled** and Enabled.

Total Memory Encryption Multi-Tenant (TME-MT)

Use this feature to support tenant-provided (SW-provided) keys. The options are **Disabled** and Enabled.

Memory Integrity

Use this feature to enable TME-MT memory integrity protection for memory transactions. The options are **Disabled** and Enabled.

The following information is displayed.

- KEY stock amount
- TME-MT key ID bits

TME Encryption Algorithm

Use this feature to set the TME encryption algorithm. The options are AES-XTS-128 and **AES-XTS-256**.

Trust Domain Extensions (TDX) [Outputs]

The following information is displayed.

- TDX activation state

Trust Domain Extensions (TDX) [Inputs]

Trust Domain Extensions (TDX) (Available when your motherboard supports Intel TDX)

Use this feature to enable Intel Trust Domain Extensions (TDX) technology support to enhance control of data security. The options are **Disabled** and Enabled.

Note: To support TDX features, DIMM population must be symmetric across integrated Memory Controllers (IMCs) and at least DIMMs per socket. For each memory controller, populating the first slots (Px-DIMMX1 or DIMMX1 depending on the motherboard design) in all channels is required. Refer to memory population below for your motherboard.

TDX Secure Arbitration Mode Loader (SEAM Loader) (Available when your motherboard supports Intel TDX and when "Trust Domain Extensions (TDX)" is set to Enabled)

The SEAM Loader (SEAMLDR) is used to load and update Intel TDX modules into the SEAM memory range by verifying the digital signature. The options are **Disabled** and Enabled.

TME-MT/TDX Key Split (Available when "Trust Domain Extensions (TDX)" is set to Enabled)

Use this feature to set the number of bits for TDX. The other bits will be used by TME-MT. The default setting is **1**.

The following information is displayed when "Trust Domain Extensions (TDX)" is set to Enabled.

- TME-MT Keys:
- TDX Keys:

Processor Reserved Memory [Capabilities]

The following information is displayed.

- PRMRR Min Size per domain
- PRMRR Max Size per domain

Processor Reserved Memory [Outputs]

The following information is displayed.

- PRMRR Size per domain
- PRM Size per socket
- PRM Size per system

Software Guard Extensions (SGX) [Outputs]

The following information is displayed when your motherboard supports SGX.

- SGX activation state
- SGX error code [HEX]

Software Guard Extensions (SGX) [Inputs]

The following features are available when your motherboard supports SGX.

Note: To support SGX features, DIMM population must be symmetric across Integrated Memory Controllers (IMCs) and at least DIMMs per socket. For each memory controller, populating the first slots (Px-DIMMX1 or DIMMX1 depending on the motherboard design) in all channels is required. Refer to memory population below for your motherboard.

SGX Factory Reset

Use this feature to perform an SGX factory reset to delete all registration data and force an Initial Platform Establishment flow. Reboot the system for the changes to take effect. The options are **Disabled** and Enabled.

SW Guard Extensions (SGX)

Use this feature to enable Intel Software Guard Extensions (SGX) support. Intel SGX is a set of extensions that increases the security of application code and data by using enclaves in memory to protect sensitive information. The options are **Disabled** and Enabled.

SGX Package Info In-Band Access

Setting this feature to Enabled is required before the BIOS provides software with the key blobs, which are generated for each CPU package. The options are **Disabled** and Enabled.

SGX PRMRR Size Requested (Available when "SW Guard Extensions (SGX)" is set to Enabled)

Use this feature to set the Processor Reserved Memory Range Register (PRMRR) size. The options are **Auto**, 128M, 256M, 512M, 1G, 2G, 4G, 8G, 16G, 32G, 64G, 128G, 256G, and 512G. Note that the available options are based on your motherboard features, memory size, and memory map.

SGX QoS (Available when "SW Guard Extensions (SGX)" is set to Enabled)

Use this feature to enable Intel SGX Quality of Service (QoS) support. QoS can enhance network performance by prioritizing network traffic. The options are Disabled and **Enabled**.

Select Owner EPOCH Input Type (Available when "SW Guard Extensions (SGX)" is set to Enabled)

Owner EPOCH is used as a parameter to add personal entropy into the key derivation process. A correct Owner EPOCH is required to have access to personal data previously sealed by other platform users. There are two Owner EPOCH modes. One is New Random Owner EPOCH, and the other is manually entered by the user. Each EPOCH is 64-bit. The options are **SGX Owner EPOCH deactivated**, Change to New Random Owner EPOCHs, and Manual User Defined Owner EPOCHs.

Note: Changing the Owner EPOCH value will lose the data in enclaves.

Software Guard Extensions Epoch 0

Use this feature to enter the EPOCH value. The default setting is **0**.

Note: This feature is available when "SW Guard Extensions (SGX)" is set to Enabled. This feature is NOT available when "Select Owner EPOCH Input Type" is set to SGX Owner EPOCH deactivated.

Software Guard Extensions Epoch 1

Use this feature to enter the EPOCH value. The default setting is **0**.

Note: This feature is available when "SW Guard Extensions (SGX)" is set to Enabled. This feature is NOT available when "Select Owner EPOCH Input Type" is set to SGX Owner EPOCH deactivated.

SGXLEPUBKEYHASHx Write Enable (Available when "SW Guard Extensions (SGX)" is set to Enabled)

Use this feature to enable writes to SGXLEPUBKEYHASH[3..0] from OS/SW. The options are Disabled and **Enabled**. Only those CPUs that support the Intel SGX Flexible Launch Control (FLC) feature have SGXLEPUBKEYHASH, which contains the hash of the public key for the SGX Launch Enclave (LE) to be signed with.

SGXLEPUBKEYHASH0 (Available when both "SW Guard Extensions (SGX)" and "SGXLEPUBKEYHASHx Write Enable" are set to Enabled)

Use this feature to enter the bytes 0–7 of SGX Launch Enclave Public Key Hash.

SGXLEPUBKEYHASH1 (Available when both "SW Guard Extensions (SGX)" and "SGXLEPUBKEYHASHx Write Enable" are set to Enabled)

Use this feature to enter the bytes 8–15 of SGX Launch Enclave Public Key Hash.

SGXLEPUBKEYHASH2 (Available when both "SW Guard Extensions (SGX)" and "SGXLEPUBKEYHASHx Write Enable" are set to Enabled)

Use this feature to enter the bytes 16–23 of SGX Launch Enclave Public Key Hash.

SGXLEPUBKEYHASH3 (Available when both "SW Guard Extensions (SGX)" and "SGXLEPUBKEYHASHx Write Enable" are set to Enabled)

Use this feature to enter the bytes 24–31 of SGX Launch Enclave Public Key Hash.

SGX Auto MP Registration (Available when "SW Guard Extensions (SGX)" is set to Enabled)

Use this feature to enable/disable SGX Auto Multi-Package Registration Agent (MPA) running automatically at boot time. The options are **Disabled** and Enabled.

IIO Configuration Menu

►IIO Configuration

PCIe ASPM Support (Global)

Use this feature to disable the Active State Power Management (ASPM) support for all PCIe root ports. The options are **Disabled** and Auto.

PCIe PLL SSC

Select Enabled for PCIe Spread Spectrum Clocking (SSC) support, which allows the BIOS to monitor and attempt to reduce the level of electromagnetic interference caused by the components whenever needed. The options are **Disabled** and Enabled.

CPU1 Configuration Menu

►CPU1 Configuration

►PCI Express 0 / PCI Express 1 / PCI Express 2 / PCI Express 3 / PCI Express 4 / PCI Express 5

Note: The number of PCIe slots and the slot naming can differ depending on the PCIe devices connected to your motherboard.

Bifurcation

This feature is CPU-dependent. Use this feature to configure the PCIe Bifurcation setting for the PCIe port you specified. The options are **Auto**, x4x4x4x4, x4x4x8, x8x4x4, x8x8, and x16.

►PCI Express 5 Port A/Port C/Port E/Port G

Note: The number of PCIe slots and the slot naming can differ depending on the PCIe devices connected to your motherboard.

Requested Link Speed

Use this feature to configure the link speed of the PCIe port you specified. The options are **Auto**, Gen 1 (2.5 GT/s), Gen 2 (5 GT/s), Gen 3 (8 GT/s), Gen 4 (16 GT/s), and Gen 5 (32 GT/s).

The following information is displayed.

- Max Link Width
- Current Link Width
- Current Link Speed

Data Link Feature Exchange

Use this feature to enable data link feature negotiation in the Data Link Feature Capabilities (DLFCAP) register. The options are Disabled and **Enabled**.

PCIe Port Max Payload Size

Use this feature to configure the maximum payload size supported in Direct Media Interface (DMI) device capabilities register for the device installed in the PCIe port. The options are 128B, 256B, 512B, and **Auto**.

MCTP

Enable this feature, Management Component Transport Protocol (MCTP), to support communications between devices in a platform management subsystem. MCTP's underlying device buses include SMBus/I^2C, serial links, PCIe, and USB. The options are Disabled and **Enabled**.

Intel VT for Directed I/O (VT-d) Menu

►Intel VT for Directed I/O (VT-d)

Note: This submenu is NOT available when "Workload Profile" is set to Virtualization.

Pre-boot DMA Protection

Select Enabled to establish DMA protection during pre-boot processing by setting DMA_CTRL_PLATFORM_OPT_IN_FLAG in the DMAR ACPI table. The options are **Enabled** and Disabled. (DMA is the abbreviation for Direct Memory Access. DMAR is the abbreviation for DMA Remapping Reporting.)

PCIe ACSCTL

Select Enabled to program ACS control to Chipset PCIe Root Port bridges. Select Disabled to program ACS control to all PCIe Root Port bridges. The options are Enabled and **Disabled**.

PCIe Leaky Bucket Configuration Menu

►PCIe Leaky Bucket Configuration

Gen2 Link Degradation

Use this feature to enable PCIe Gen2 link degradation. Applies only when operating at PCIe Gen2 speeds. The options are Disabled and **Enabled**.

Gen3 Link Degradation

Use this feature to enable PCIe Gen3 link degradation. Applies only when operating at PCIe Gen3 speeds. The options are Disabled and **Enabled**.

Gen4 Link Degradation

Use this feature to enable PCIe Gen4 link degradation. Applies only when operating at PCIe Gen4 speeds. The options are Disabled and **Enabled**.

Gen5 Link Degradation

Use this feature to enable PCIe Gen5 link degradation. The options are Disabled and **Enabled**.

Super IO Configuration Menu

►Super IO Configuration

The following information is displayed.

- Super IO Chip

Note: This submenu is available when your system supports this feature.

Serial Port 1 Configuration Menu

►Serial Port 1 Configuration

Serial Port 1

Select Enabled to enable serial port 1. The options are Disabled and **Enabled**.

Device Settings (Available when "Serial Port 1" above is set to Enabled)

This feature displays the base I/O port address and the Interrupt Request address of serial port 1.

Change Settings (Available when "Serial Port 1" above is set to Enabled)

Use this feature to specify the base I/O port address and the Interrupt Request address of serial port 1. Select Auto for the BIOS to automatically assign the base I/O and IRQ address to serial port 1. The options are **Auto**, (IO=3F8h; IRQ=4;), (IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12;), (IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12;), (IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;), and (IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;).

Serial Port 2 Configuration Menu

►Serial Port 2 Configuration

Note: It can be "Serial Port 2 Configuration" or "SOL Configuration" based on your system support.

Serial Port 2/SOL ("Serial Port 2" or "SOL" based on your system support)

Select Enabled to enable serial port 2 (or SOL). The options are Disabled and **Enabled**.

Device Settings (Available when "Serial Port 2/SOL" above is set to Enabled)

This feature displays the base I/O port address and the Interrupt Request address of serial port 2 (or SOL).

Change Settings (Available when "Serial Port 2/SOL" above is set to Enabled)

Use this feature to specify the base I/O port address and the Interrupt Request address of serial port 2 (or SOL). Select Auto for the BIOS to automatically assign the base I/O and IRQ address to serial port 2 (or SOL).

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

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

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

Serial Port Console Redirection Menu

►Serial Port Console Redirection

COM1 (Available when your system supports the serial port of COM1)

Console Redirection

Select Enabled to enable COM port 1 for Console Redirection, which allows a client machine to be connected to a host machine at a remote site for networking. The options are **Disabled** and Enabled.

Note: This feature will be set to Enabled if there is no BMC support.

SOL/COM2

Note: This feature is available when your system supports serial port of SOL and/or COM2. The "SOL/COM2" here indicates a shared serial port, and SOL is used as the default.

Console Redirection

Select Enabled to use the SOL/COM2 port for Console Redirection. The options are Disabled and **Enabled**.

►Console Redirection Settings

Note: This submenu is available when "Console Redirection" for COM1 or SOL/COM2 is set to Enabled.

Terminal Type

Use this feature to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII character set. Select VT100+ to add color and function key support. Select ANSI to use the extended ASCII character set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are VT100, **VT100+**, VT-UTF8, and ANSI.

Bits Per Second

Use this feature to set the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 38400, 57600, and **115200** (bits per second).

Data Bits

Use this feature to set the data transmission size for Console Redirection. The options are 7 and **8** (bits).

Parity

A parity bit can be sent along with regular data bits to detect data transmission errors. Select Even if the parity bit is set to 0 and the number of 1s in data bits is even. Select Odd if the parity bit is set to 0 and the number of 1s in data bits is odd. Select None if you do not want to send a parity bit with your data bits in transmission. Select Mark to add a mark as a parity bit to be sent along with the data bits. Select Space to add a space as a parity bit to be sent with your data bits. The options are **None**, Even, Odd, Mark, and Space.

Stop Bits

A stop bit indicates the end of a serial data packet. Select 1 (stop bit) for standard serial data communication. Select 2 (stop bits) if slower devices are used. The options are **1** and 2.

Flow Control

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

VT-UTF8 Combo Key Support

Select Enabled to enable VT-UTF8 Combination Key support for ANSI/VT100 terminals. The options are Disabled and **Enabled**.

Recorder Mode

Select Enabled to capture the data displayed on a terminal and send it as text messages to a remote server. The options are **Disabled** and Enabled.

Resolution 100x31

Select Enabled for extended-terminal resolution support. The options are Disabled and **Enabled**.

Putty KeyPad

Use this feature to select function key and keypad settings on Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, LINUX, XTERMR6, SCO, ESCN, and VT400.

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

Use the features below to configure Console Redirection settings to support Out-of-Band Serial Port management.

Console Redirection EMS

Select Enabled to use the SOL port for Console Redirection. The options are **Disabled** and Enabled.

►Console Redirection Settings

Note: This submenu is available when "Console Redirection EMS" is set to Enabled.

Out-of-Band Mgmt Port

The feature selects a serial port in a client server to be used by the Microsoft Windows Emergency Management Services (EMS) to communicate with a remote host server. The options are **COM1** and SOL/COM2. Please note that the option of SOL/COM2 indicates a shared serial port. SOL is available with BMC support.

Terminal Type EMS

Use this feature to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII character set. Select VT100+ to add color and function key support.

Select ANSI to use the extended ASCII character set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are VT100, VT100+, **VT-UTF8**, and ANSI.

Bits Per Second EMS

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

Flow Control EMS

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

The following information is displayed.

- **Data Bits EMS**
- **Parity EMS**
- **Stop Bits EMS**

Network Stack Configuration Menu

►Network Stack Configuration

Network Stack

Select Enabled to enable Preboot Execution Environment (PXE) or Unified Extensible Firmware Interface (UEFI) for network stack support. The options are Disabled and **Enabled**.

IPv4 PXE Support (Available when "Network Stack" is set to Enabled)

Select Enabled to enable IPv4 PXE boot support. If this feature is disabled, it will not create the IPv4 PXE boot option. The options are Disabled and **Enabled**.

IPv4 HTTP Support (Available when "Network Stack" is set to Enabled)

Select Enabled to enable IPv4 HTTP boot support. If this feature is disabled, it will not create the IPv4 HTTP boot option. The options are **Disabled** and Enabled.

IPv6 PXE Support (Available when "Network Stack" is set to Enabled)

Select Enabled to enable IPv6 PXE boot support. If this feature is disabled, it will not create the IPv6 PXE boot option. The options are Disabled and **Enabled**.

IPv6 HTTP Support (Available when "Network Stack" is set to Enabled)

Select Enabled to enable IPv6 HTTP boot support. If this feature is disabled, it will not create the IPv6 HTTP boot option. The options are **Disabled** and Enabled.

PXE Boot Wait Time (Available when "Network Stack" is set to Enabled)

Use this feature to set the wait time (in seconds) upon which the system BIOS will wait for you to press the <ESC> key to abort PXE boot instead of proceeding with PXE boot by connecting to a network server immediately. Press the <+> or <-> key on your keyboard to change the value. The default setting is **0**.

Media Detect Count (Available when "Network Stack" is set to Enabled)

Use this feature to set the wait time (in seconds) for the BIOS ROM to detect the presence of a LAN media either via the Internet connection or via a LAN port. Press the <+> or <-> key on your keyboard to change the value. The default setting is **1**.

PCIe/PCI/PnP Configuration Menu

►PCIe/PCI/PnP Configuration

The following information is displayed.

- PCI Bus Driver Version

PCI Devices Common Settings:

Above 4G Decoding

Select Enabled to decode a PCI device that supports 64-bit in the space above 4G Address. The options are Disabled and **Enabled**.

Re-Size BAR Support

Use this feature to enable the Resizable BAR support. Resizable BAR is a PCIe interface technology that allows the CPU to access the entire frame buffer. With this technology, your system will be able to handle multiple CPU to GPU transfers simultaneously rather than queuing, which can improve the frame rate performance. The options are **Disabled** and Enabled.

MMCFG Base

This feature determines how the lowest Memory Mapped Configuration (MMCFG) base is assigned to onboard PCI devices. The options are 1G, 1.5G, 1.75G, 2G, 2.25G, 3G, and **Auto**. The options of 2G and 2.25G are not available when the MMCFG size is 2G. The option of 3G is not available when the MMCFG size is 1G or 2G.

MMCFG Size

Use this feature to set the MMCFG size. The options are 64M, 128M, 256M, 512M, 1G, 2G, and **Auto**. Note that the MMCFG size is based on the memory populated.

MMIO High Base

Use this feature to select the base memory size according to memory-address mapping for the I/O hub. The options are 248T, 120T, 88T, 60T, 30T, 56T, 40T, 32T, 24T, 16T, 4T, 2T, 1T, 512G, 3584T, and **Auto**. The options of 248T, 120T, 88T, 60T, 30T, and 3584T are CPU-dependent.

MMIO High Granularity Size

Use this feature to select the high memory size according to memory-address mapping for the I/O hub. The options are 1G, 4G, 16G, 32G, 64G, 256G, and **1024G**. This feature is motherboard-dependent.

SR-IOV Support (Unavailable when "Workload Profile" is set to Virtualization)

Select Enabled for Single-Root IO Virtualization support. The options are Disabled and **Enabled**.

Bus Master Enable

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

ARI Support

Select Enabled for Alternative Routing-ID Interpretation (ARI) support. The options are Disabled and **Enabled**.

NVMe Firmware Source

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

VGA Priority

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

Onboard Video Option ROM

Select EFI to boot the computer using the Extensible Firmware Interface (EFI) device installed on the onboard video port. The options are Disabled and **EFI**.

Onboard LAN1 Option ROM

Select EFI to boot the computer using the EFI device installed on LAN port 1. The options are Disabled and **EFI**.

Note: This feature is available when your motherboard supports onboard LAN ports.

Onboard LAN2 Option ROM

Use this feature to boot the computer using the EFI device installed on LAN port 2. Select Disabled to disable this feature. The default setting is **Disabled**.

Note: This feature is available when your motherboard supports onboard LAN ports and when "Onboard LAN1 Option ROM" is set to Disabled.

ACPI Settings Menu

►ACPI Settings

NUMA

Use this feature to enable Non-Uniform Memory Access (NUMA) support to minimize memory access latencies. The options are Disabled and **Enabled**. This feature is CPU-dependent.

Virtual NUMA

Enable this feature to optimize the memory-access performance for VMware virtual machines. The options are **Disabled** and Enabled.

Note: This feature is NOT available when "Workload Profile" is set to Telco NFVI, Telco NFVI-FP, or Telco FlexRAN.

UMA-Based Clustering

Use this feature to select UMA-Based Clustering. The options are **Disabled (All2All)** and Hemisphere (2-clusters).

WHEA Support

Select Enabled to support the Windows Hardware Error Architecture (WHEA) platform and provide a common infrastructure for the system to handle hardware errors within the Windows OS environment to reduce system crashes and to enhance system recovery and health monitoring. The options are Disabled and **Enabled**.

Number of Virtual NUMA Nodes (Available when "Virtual NUMA" is set to Enabled)

This feature displays the number of virtual NUMA nodes. A NUMA architecture divides hardware resources (including processors, memory, and I/O buses) into groups, called NUMA nodes. This feature indicates the available number of virtual NUMA nodes that can be assigned to the virtual machine. By default, this setting is automatically adjusted to match the physical NUMA topology.

High Precision Event Timer

Use this feature to enable High Precision Event Timer. The options are **Disabled** and Enabled.

Trusted Computing Menu

►Trusted Computing

When the TPM 2.0 (either onboard or external) is detected by your system, the following information is displayed.

- TPM 2.0 Device Found
- Firmware Version:
- Vendor:

Note: This submenu is available when the TPM 2.0 (either onboard or external) is detected by the BIOS.

Security Device Support

Select Enabled to enable BIOS support for onboard security devices, which are not displayed in the OS. If this feature is set to Enabled, TCG EFI protocol and INT1A interface will not be available. The options are Disabled and **Enabled**.

When "Security Device Support" is set to Enabled and the TPM 2.0 (either onboard or external) is detected by the BIOS, the following information is displayed.

- Active PCR banks
- Available PCR banks

Note: The following features are available when the TPM 2.0 (either onboard or external) is detected by the BIOS.

SHA-1 PCR Bank (Available when "Security Device Support" is set to Enabled)

Select Enabled to enable SHA-1 PCR Bank support to enhance system integrity and data security. The options are Disabled and **Enabled**.

SHA256 PCR Bank (Available when "Security Device Support" is set to Enabled)

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

SHA384 PCR Bank (Available when "Security Device Support" is set to Enabled)

Select Enabled to enable SHA384 PCR Bank support to enhance system integrity and data security. The options are **Disabled** and Enabled.

Pending Operation (Available when "Security Device Support" is set to Enabled)

Use this feature to schedule a TPM-related operation to be performed by the security TPM (either onboard or external) at the next system boot to enhance system data integrity. The options are **None** and TPM Clear.

Note: If this feature is used, your system will reboot to carry out a pending TPM operation.

Platform Hierarchy (Available when "Security Device Support" is set to Enabled)

Select Enabled for TPM Platform Hierarchy support, which allows the manufacturer to utilize the cryptographic algorithm to define a constant key or a fixed set of keys to be used for initial system boot. These early boot codes are shipped with the platform and are included in the list of "public keys." During system boot, the platform firmware uses the trusted public keys to verify a digital signature in an attempt to manage and control the security of the platform firmware used in a host system via the TPM (either onboard or external). The options are Disabled and **Enabled**.

Storage Hierarchy (Available when "Security Device Support" is set to Enabled)

Select Enabled for TPM Storage Hierarchy support that is intended to be used for non-privacy-sensitive operations by a platform owner such as an IT professional or the end user. Storage Hierarchy has an owner policy and an authorization value, both of which can be set and are held constant (-rarely changed) through reboots. This hierarchy can be cleared or changed independently of the other hierarchies. The options are Disabled and **Enabled**.

Endorsement Hierarchy (Available when "Security Device Support" is set to Enabled)

Select Enabled for Endorsement Hierarchy support, which contains separate controls to address the user's privacy concerns because the primary keys in the hierarchy are certified by the TPM key or by a manufacturer with restrictions on how an authentic TPM (either onboard or external) that is attached to an authentic platform can be accessed and used. A primary key can be encrypted and certified with a certificate created by using TPM2_ActivateCredential, which allows the user to independently enable "flag, policy, and authorization values" without involving other hierarchies. A user with privacy concerns can disable the endorsement hierarchy while still using the storage hierarchy for TPM applications, permitting the platform software to use the TPM. The options are Disabled and **Enabled**.

PH Randomization

Select Enabled for Platform Hierarchy (PH) Randomization support, which is used only during the platform developmental stage. This feature cannot be enabled in the production platforms. The options are **Disabled** and Enabled.

Supermicro BIOS-Based TPM Provision Support

Set this feature to Enabled to unlock the TPM. Save settings and exit the BIOS Setup utility. The Non-volatile (NV) indexes can be deleted after the system reboot. The options are **Disabled** and Enabled.

Supermicro KMS Server Configuration Menu

►Supermicro KMS Server Configuration

Note: Be sure to configure all the features in the submenu of Supermicro KMS Server Configuration and the feature of "KMS Security Policy" in the submenu of Super-Guardians Configuration so that your system can communicate with the KMS server.

Supermicro KMS Server IP address

Use this feature to set the Supermicro Key Management Service (KMS) server IPv4 address in dotted-decimal notation.

Second Supermicro KMS Server IP address

Use this feature to set the second Supermicro KMS server IPv4 address in dotted-decimal notation.

Supermicro KMS TCP Port number

Use this feature to set the TCP port number used in the Supermicro KMS server. The valid range is 100–9999. The default setting is **5696**. Do not change the default setting unless a different TCP port number has been specified and used in the Supermicro KMS server.

KMS Time Out

Use this feature to enter the KMS server connecting time-out (in seconds). The default setting is **5** (seconds).

TimeZone

Use this feature to set the correct time zone. The default setting is **0** (not specified).

Client UserName

Press <Enter> to set the client identity (UserName). The length is 0–63 characters.

Client Password

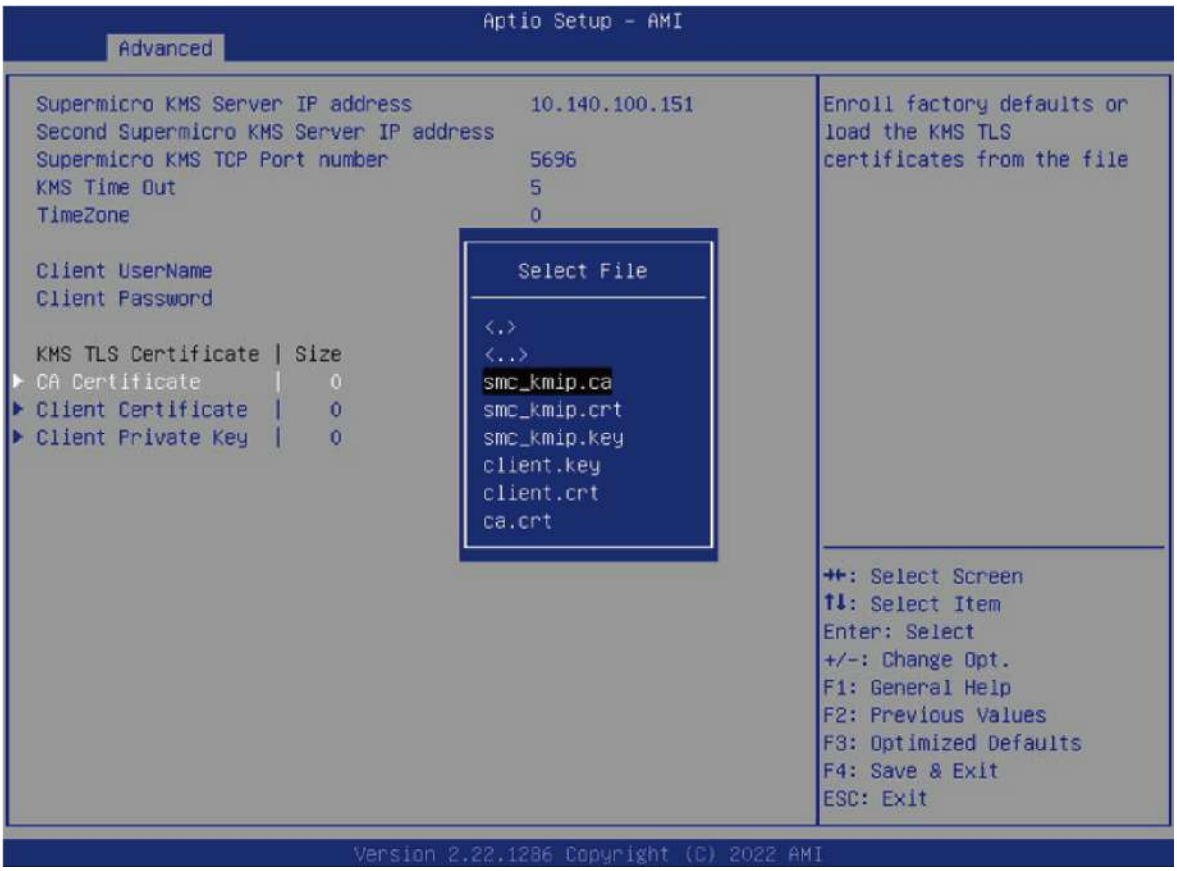
Press <Enter> to set the client identity (Password). The length is 0–31 characters.

►CA Certificate

►Client Certificate

►Client Private Key

Use the three features above to enroll factory defaults or load the KMS Transport Layer Security (TLS) certificates, which are generated by the KMS server, from the file stored in the USB flash drive as shown below.



Private Key Password (Available when "Client Private Key" above has been set)

Use this feature to change the private key password.

Super-Guardians Configuration Menu

►Super-Guardians Configuration

Super-Guardians Protection Policy

Use this feature to enable the Super-Guardians Protection Policy. The options are **Storage**, System, and System and Storage. Set this feature to Storage to protect and have secure access to the Trusted Computing Group (TCG) NVMe devices with the Authentication-Key (AK). Set this feature to System to protect and have secure access to your system/motherboard with the AK. Set this feature to System and Storage to protect and have secure access to your system/motherboard/storage devices with the AK.

KMS Security Policy (Available when "TPM Security Policy" and "USB Security Policy" are set to Disabled)

Set this feature to Enabled to enable the KMS Security Policy. When this feature has not previously been set to Enabled, the options are **Disabled** and Enabled. Changes take effect after you save settings and reboot the system.

When this feature has previously been set to Enabled, the options are **Enabled**, Reset, and Key Rotation. Set this feature to Key Rotation to obtain an existing AK from the KMS server and create a new AK. To disable the KMS Security Policy, set this feature to Reset. When this feature is set to Reset, the system and TCG NVMe devices chosen in "Super-Guardians Protection Policy" will be in the unprotected mode.

Notes:

- Be sure that the KMS server is ready before configuring this feature.
- Use the professional KMS server solutions (e.g., Thales Server) or the Supermicro PyKMIP Software Package to establish the KMS server.

KMS Server Retry Count (Available when "TPM Security Policy" and "USB Security Policy" are set to Disabled)

Use this feature to specify how many times the system will attempt reconnecting to the KMS server. The valid range is 0–10. Press the <+> or <-> key on your keyboard to change the value. The default setting is **5**. If the value is 0, the system will retry infinitely.

TPM Security Policy (Available when "KMS Security Policy" and "USB Security Policy" are set to Disabled)

Set this feature to Enabled to enable the TPM Security Policy. When this feature has not previously been set to Enabled, the options are **Disabled** and Enabled. Changes take effect after you save settings and reboot the system.

When this feature has previously been set to Enabled, the options are **Enabled** and Reset. To disable the TPM Security Policy, set this feature to Reset. When this feature is set to Reset, the system and TCG NVMe devices chosen in "Super-Guardians Protection Policy" will be in the unprotected mode.

Load Authentication-Key (Available when "KMS Security Policy," "TPM Security Policy," and "USB Security Policy" are set to Disabled)

The options are **Disabled** and Enabled. Set this feature to Enabled. Changes take effect after you save settings and reboot the system. While booting, the BIOS will automatically load the Authentication-Key (filename: TPMAuth.bin) from the USB flash drive. Afterwards, the default setting will be set to Disabled by the BIOS.

Notes:

- Be sure to connect a USB flash drive with the Authentication-Key (filename: TPMAuth.bin) to your system before the system reboot.
- Be sure to save the Authentication-Key (filename: TPMAuth.bin) to the USB flash drive and keep a backup. Load the Authentication-Key (filename: TPMAuth.bin) after the TPM (either onboard or external) is detected by your system. Otherwise, the TPM function can not work properly.

Save Authentication-Key (Available when "TPM Security Policy" is set to Enabled)

The options are **Disabled** and Enabled. Set this feature to Enabled. Changes take effect after you save settings and reboot the system. While booting, the BIOS will automatically save the Authentication-Key (filename: TPMAuth.bin) to the USB flash drive. Afterwards, the default setting will be set to Disabled by the BIOS.

Note: Be sure to connect a USB flash drive to your system before the system reboot.

USB Security Policy (Available when "KMS Security Policy" and "TPM Security Policy" are set to Disabled)

Use this feature to enable the USB Security Policy. The options are **Disabled** and Enabled. Set this feature to Enabled. Changes take effect after you save settings and reboot the system. Connect a USB flash drive to your system before the system reboot. While booting, the BIOS will automatically create the USB Authentication-Key (filename: USBAuth.bin) and save it to the USB flash drive.

When this feature has been previously set to Enabled, the options are **Enabled** and Reset. To disable the USB Security Policy, set this feature to Reset. When this feature is set to Reset, the system and TCG NVMe devices chosen in "Super-Guardians Protection Policy" will be in the unprotected mode.

Note: Be sure to connect a USB flash drive to your system before configuring this feature. Save the USB Authentication-Key (filename: USBAuth.bin) to the USB flash drive and keep a backup.

HTTP Boot Configuration Menu

►HTTP Boot Configuration

HTTP Boot Policy

Use this feature to set the HTTP boot policy. The options are Apply to all LANs, **Apply to each LAN**, and Boot Priority #1 instantly.

HTTPS Boot Checks Hostname

Important: Disabling "HTTPS Boot Checks Hostname" is a violation of RFC 6125 and may expose you to Man-in-the-Middle Attacks. Supermicro is not responsible for any and all security risks incurred by you disabling this feature.

Enable this feature for HTTPS boot to check the hostname of the TLS certificates to see if it matches the host name provided by the remote server. The options are **Enabled** and Disabled (WARNING: Security Risk!!).

Priority of HTTP Boot

Instance of Priority 1: (Available when your motherboard supports this feature)

This feature sets the rank target port. The default setting is **1**.

Select IPv4 or IPv6

This feature specifies which connection the target LAN port should boot from. The options are **IPv4** and IPv6.

Boot Description

Use this feature to enter a boot description, which cannot be longer than 75 characters. Please be sure to enter a boot description; otherwise, the boot option for the URI cannot be created.

Boot URI

Enter a Boot Uniform Research Identifier (URI) with 128 characters or shorter. This Boot URI determines how IPv4 Boot Option and IPv6 Boot Option will be created.

Instance of Priority 2: (Available when your motherboard supports this feature)

This feature sets the rank target port. The default setting is **0**.

Select IPv4 or IPv6 (Unavailable when "Instance of Priority 2:" above is set to 0)

This feature specifies which connection the target LAN port should boot from. The options are **IPv4** and IPv6.

Boot Description (Unavailable when "Instance of Priority 2:" above is set to 0)

Use this feature to enter a boot description, which cannot be longer than 75 characters. Please be sure to enter a boot description; otherwise, the boot option for the URI cannot be created.

Boot URI (Unavailable when "Instance of Priority 2:" above is set to 0)

Enter a Boot URI with 128 characters or shorter. This Boot URI determines how IPv4 Boot Option and IPv6 Boot Option will be created.

System Diagnostics Configuration Menu

►System Diagnostics Configuration

Launch System Diagnostics

Set this feature to Launch Once to launch system diagnostics on next system boot. The options are **Disabled** and Launch Once.

Note: Pressing <F7> during system bootup can also launch system diagnostics.

Intel(R) Ethernet Controller Menu

►Intel(R) Ethernet Controller (Ethernet controller) - (MAC address)

Notes:

- The Ethernet controller and MAC address shown above are based on your system features.
- This submenu is available when "Onboard LAN1 Option ROM" is set to EFI.

►NIC Configuration

Link Speed

Use this feature to set the connection speed of a selected LAN port. The options are **Auto Negotiated**, 10 Mbps Half, 10 Mbps Full, 100 Mbps Half, and 100 Mbps Full.

Wake On LAN

Set this feature to support system wake-up via the selected LAN port. If this feature is set to Enabled, the LAN port selected will be enabled when the system is powered on. The options are Disabled and **Enabled**.

LLDP Agent

Use this feature to enable or disable Link Layer Discovery Protocol (LLDP) agent support on a long-term basis. The LLDP, a vendor-neutral link layer protocol, is used by a network device to identify itself and announce its capability to the neighboring devices in a network environment for networking. When disabling the LLDP agent in the firmware, the function of Data Center Bridging (DCB) will also be disabled. The options are Disabled and **Enabled**.

Blink LEDs

Use this feature to identify the physical network port by blinking the associated LEDs. The default setting is **0** (up to 15 seconds).

The following information is displayed.

- UEFI Driver
- Adapter PBA
- Device Name
- Chip Type
- PCI Device ID
- PCI Address
- Link Status
- MAC Address
- Virtual MAC Address

TLS Authenticate Configuration Menu

►TLS Authenticate Configuration

Use this submenu to configure Transport Layer Security (TLS) settings.

►Server CA Configuration

Use this feature to configure the client certificate that is to be used by the server.

►Enroll Certification

Use this feature to enroll the certificate in the system.

►Enroll Certification Using File

Use this feature to enroll the security certificate in the system by using a file.

►Commit Changes and Exit

Use this feature to save all changes and exit TLS settings.

►Discard Changes and Exit

Use this feature to discard all changes and exit TLS settings.

►Delete Certification

Use this feature to delete the certificate if a certificate has been enrolled in the system.

►Client Certification Configuration

Vlan Configuration

►►Enter Configuration Menu

Create New VLAN

VLAN ID

Highlight this feature and enter a value between 0 and 4094 for the VLAN ID.

Priority

Highlight this feature and enter a value between 0 and 7 for the VLAN priority.

Add VLAN

Use this feature to create a new VLAN based on the information in VLAN ID and Priority.

Configured VLAN List

This feature displayed VLANs that were created with the Add VLAN feature.

Remove VLAN

Use this feature to remove selected VLANs from the Configured VLAN List.

Driver Health Menu

►Driver Health

This feature displays the health information of the drivers installed in your system, including LAN controllers, as detected by the BIOS. Select one and press <Enter> to see the details.

Note: This section is provided for reference only, for the driver health status will differ depending on the drivers installed in your system. It's also based on your system configuration and the environment that your system is operating in.

8.4 Event Logs

Use this menu to configure Event Logs settings.

Note: After making any changes in this section, please be sure to reboot the system for the changes to take effect.

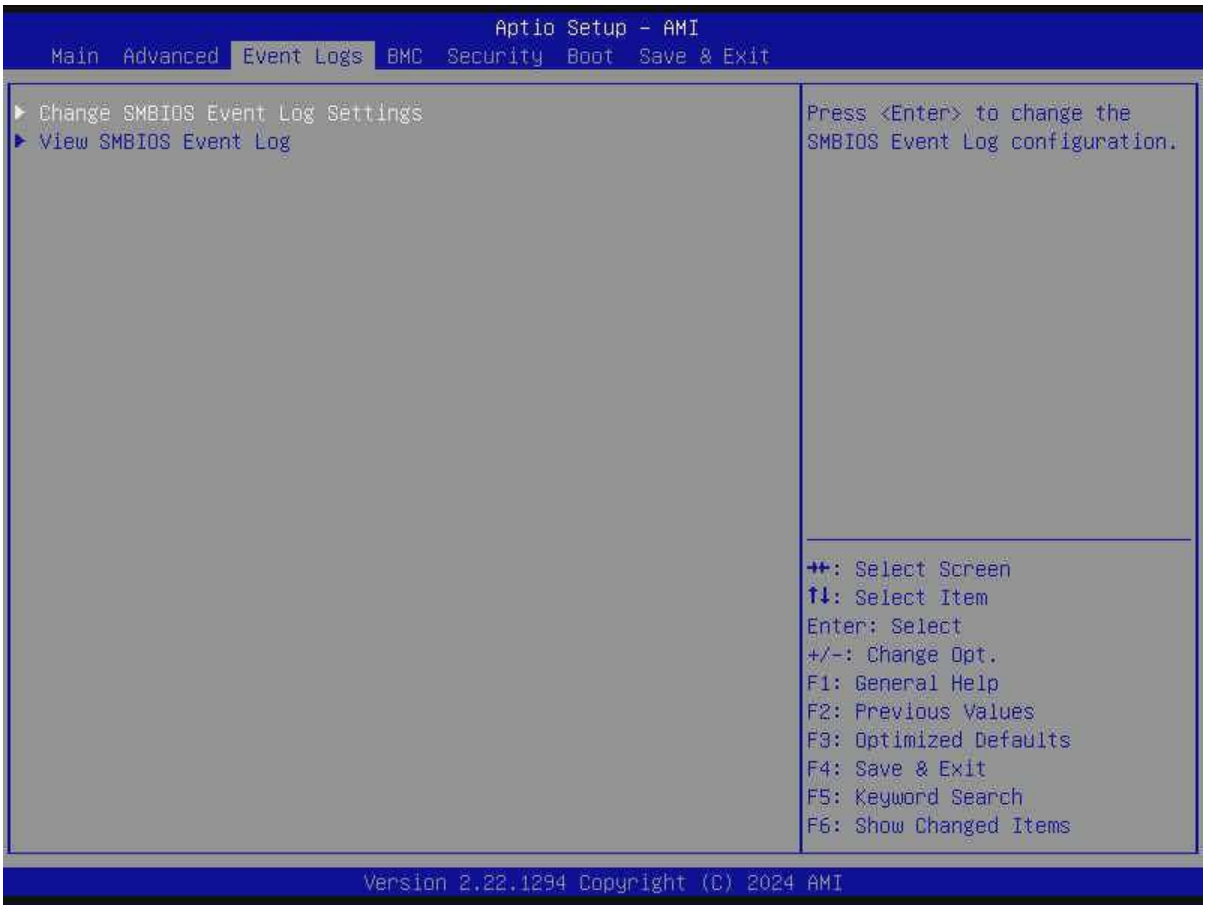


Figure 8-3. Event Log Page

►Change SMBIOS Event Log Settings

Note: Reboot the system for the changes in this section to take effect.

Enabling/Disabling Options

SMBIOS Event Log

Select Enabled to enable System Management BIOS (SMBIOS) Event Logging during system boot. The options are Disabled and **Enabled**.

Erasing Settings

Erase Event Log (Available when "SMBIOS Event Log" is set to Enabled)

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

When Log is Full (Available when "SMBIOS Event Log" is set to Enabled)

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

SMBIOS Event Log Standard Settings

Log System Boot Event (Available when "SMBIOS Event Log" is set to Enabled)

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

MECI (Available when "SMBIOS Event Log" is set to Enabled)

Enter the increment value for the multiple event counter. Enter a number between 1 and 255. The default setting is **1**. (MECI is the abbreviation for Multiple Event Count Increment.)

METW (Available when "SMBIOS Event Log" is set to Enabled)

Use this feature to determine how long (in minutes) should the multiple event counter wait before generating a new event log. Enter a number between 0 and 99. The default value is **60**. (METW is the abbreviation for Multiple Event Count Time Window.)

►View SMBIOS Event Log

Use this feature to view the events in the system event log. Select this feature and press <Enter> to view the status of an event in the log. The following information is displayed: DATE / TIME / ERROR CODE / SEVERITY.

8.5 BMC

Use this menu to configure Baseboard Management Console (BMC) settings.

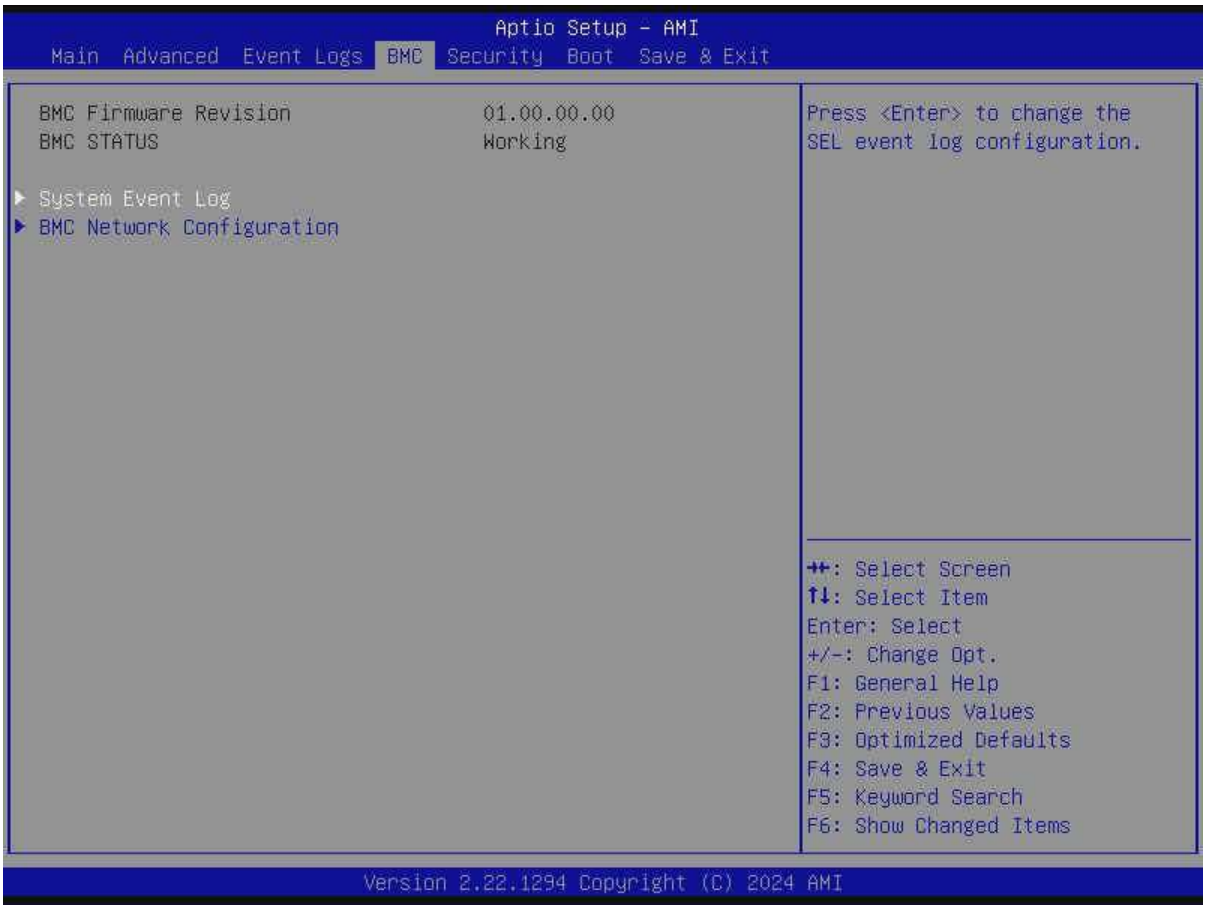


Figure 8-4. BMC Setting Page

BMC Firmware Revision

This feature indicates the BMC firmware revision used in this system.

BMC STATUS

This feature indicates the status of the BMC firmware installed in this system.

8.6 Security

Use this menu to configure the following security settings for the system.

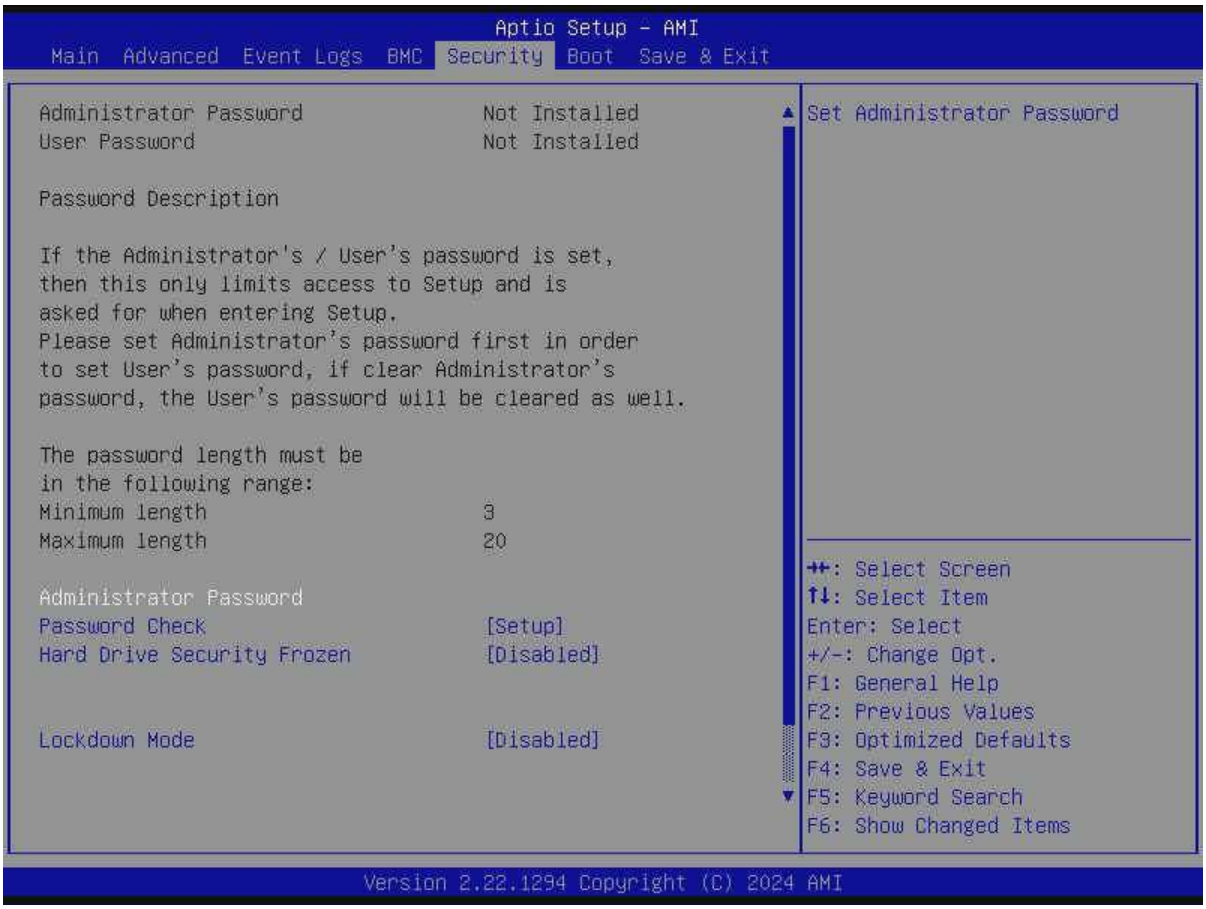


Figure 8-5. Security Setting Page

Disable Block Sid and Freeze Lock (Available when your storage devices support TCG)

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

The following information is displayed:

- Administrator Password
- User Password
- Password Description

Administrator Password

This feature indicates if an administrator password has been installed. Use this feature to set the administrator password, which is required to enter the BIOS Setup utility. The length of the password can be between three and 20 characters long.

User Password (Available when "Administrator Password" has been set)

This feature indicates if a user password has been installed. Use this feature to set the user password which is required to enter the BIOS Setup utility. The length of the password can be between three and 20 characters long.

Password Check

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

Hard Drive Security Frozen

Select Enabled to freeze the Lock Security feature for HDD to protect key data in hard drives from being altered. The options are **Disabled** and Enabled.

Lockdown Mode (Available when the DCMS key is activated)

Select Enabled to support the Lockdown Mode, which prevents the existing data or keys stored in the system from being altered or changed in an effort to preserve system integrity and security. The options are **Disabled** and Enabled.

8.7 Boot

Use this menu to configure Boot settings.

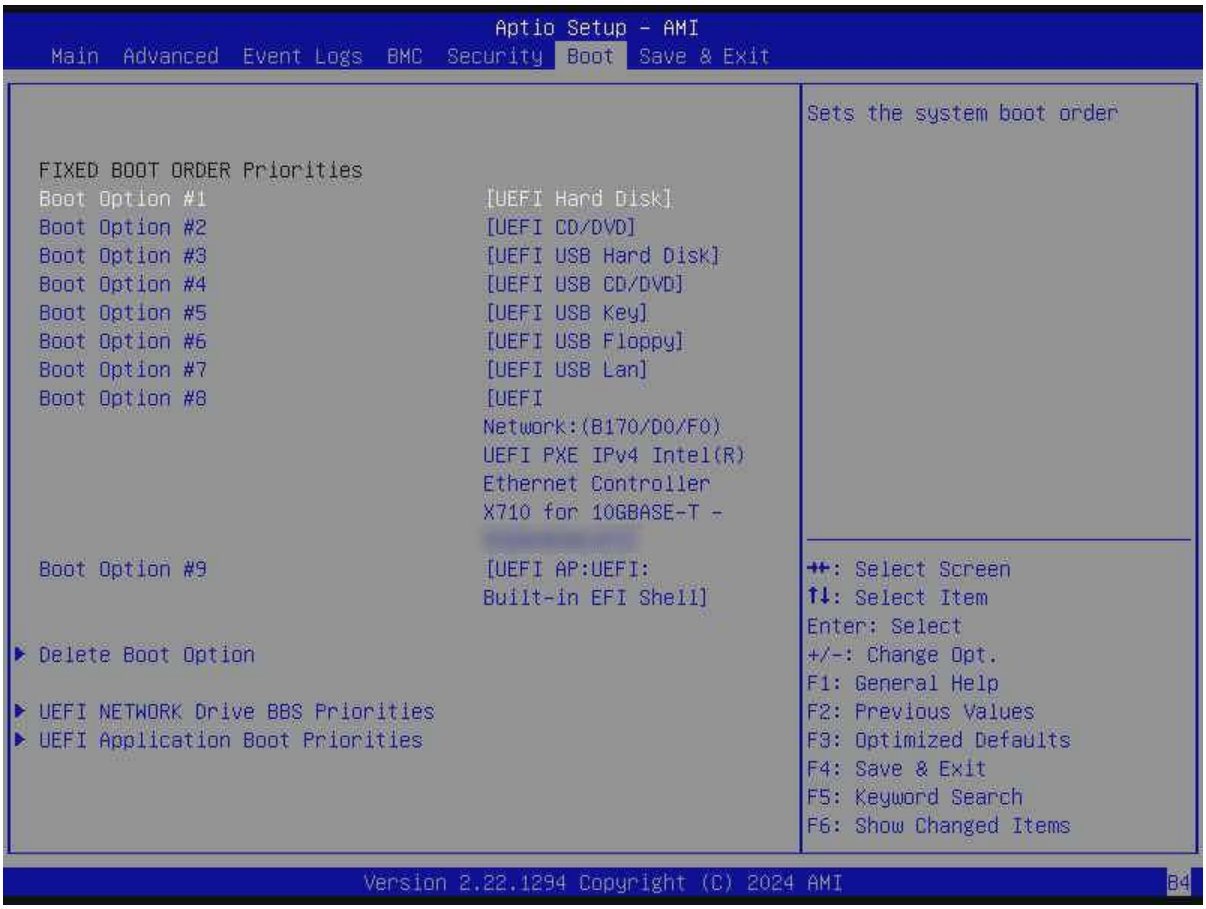


Figure 8-6. Boot Setting Page

FIXED BOOT ORDER Priorities

Use this feature to prioritize the order of a bootable device from which the system will boot. Press <Enter> on each item sequentially to select the device.

- Boot Option #1 – Boot Option #9

►Add New Boot Option

Use this feature to add a new boot option to the boot priority features for system boot.

Note: This submenu is available when any storage device is detected by the BIOS.

Add boot option

Use this feature to specify the name for the new boot option.

Path for boot option

Use this feature to enter the path for the new boot option in the format fsx:\path\filename.efi.

Boot option File Path

Use this feature to specify the file path for the new boot option.

Create

After setting the name and the file path for the boot option, press <Enter> to create the new boot option in the boot priority list.

►Delete Boot Option

Use this feature to select a boot device to delete from the boot priority list.

Delete Boot Option

Use this feature to remove an EFI boot option from the boot priority list.

►UEFI NETWORK Drive BBS Priorities

Use this feature to set the system boot order of detected devices.

►UEFI Application Boot Priorities

Use this feature to set the system boot order of detected devices.

►UEFI USB Key Drive BBS Priorities

Use this feature to set the system boot order of detected devices.

►UEFI Hard Disk Drive BBS Priorities

Use this feature to set the system boot order of detected devices.

8.8 Save & Exit

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

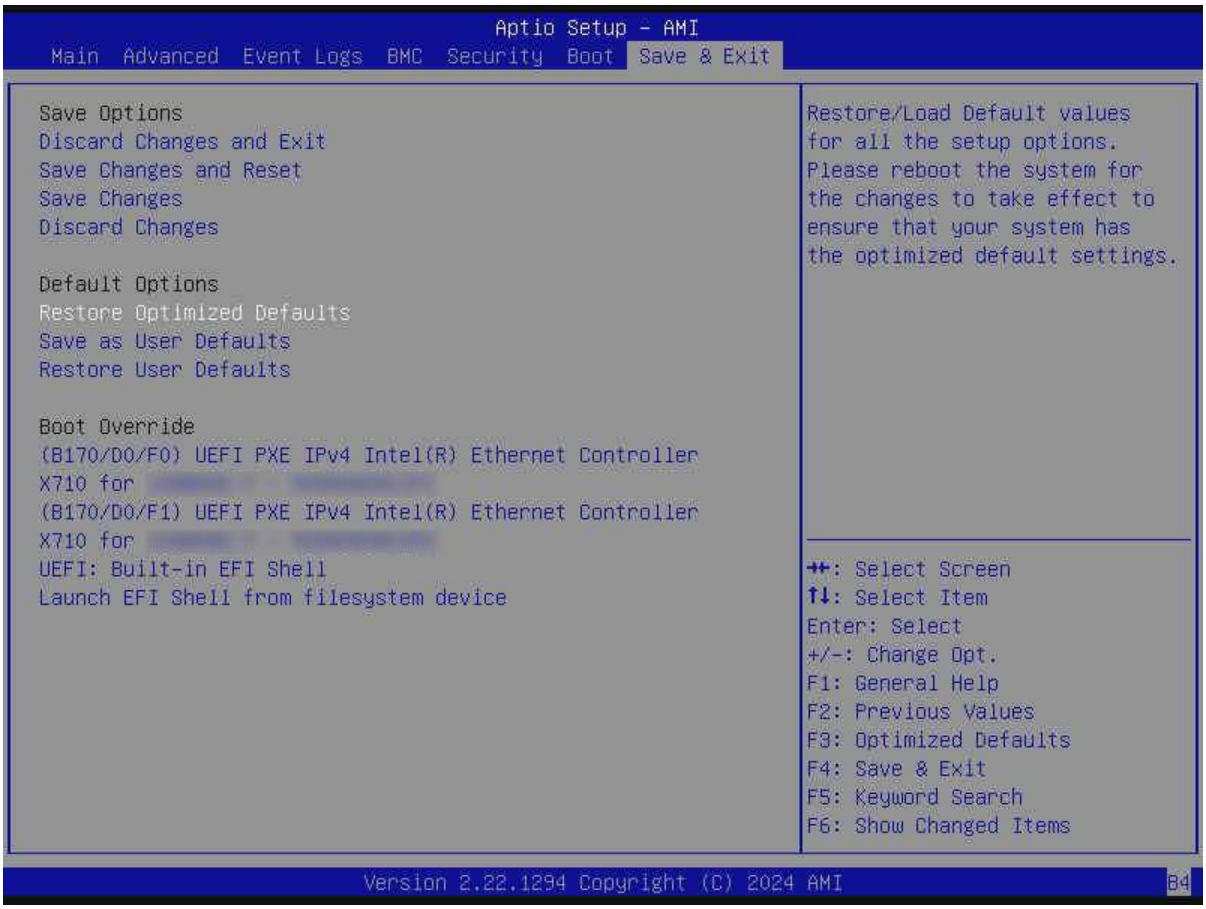


Figure 8-7. Save & Exit Page

Save Options

Discard Changes and Exit

Use this feature to exit from the BIOS Setup utility without making any permanent changes to the system configuration and reboot the computer.

Save Changes and Reset

On completing the system configuration changes, use this feature to exit the BIOS Setup utility and reboot the computer for the new system configuration parameters to take effect.

Save Changes

On completing the system configuration changes, use this feature to save all changes made. This will not reset (reboot) the system.

Discard Changes

Select this feature and press <Enter> to discard all changes made and return to the BIOS Setup utility.

Default Options

Restore Optimized Defaults

Select this feature and press <Enter> to load manufacturer optimized default settings, which are intended for maximum system performance but not for maximum stability.

Note: Reboot the system for the changes to take effect to ensure that the system has the optimized default settings.

Save as User Defaults

Select this feature and press <Enter> to save all changes as the default values specified to the BIOS Setup utility for future use.

Restore User Defaults

Select this feature and press <Enter> to retrieve user-defined default settings that have been saved previously.

Boot Override

Note: Use this section to override the Boot priorities sequence in the Boot menu, and immediately boot the system with a device specified here instead of the one specified in the boot list. This is a one-time boot override.

Launch EFI Shell from filesystem device

Use this feature to launch the EFI shell application (Shell.efi) from one of the available filesystem devices. A filesystem is a virtual, logical, or physical system for organizing, managing, and accessing the files and directories on devices such as SSDs, HDDs, or other storage devices.

Appendix A:

Standardized Warning Statements for AC Systems

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 section in its entirety before installing or configuring components in the Supermicro SYS-A22GA-NBRT server.

These warnings may also be found on our website at the following page:

https://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.

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。

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 الز هز عٌ خطز !تحذ زٌ.

قبل أى تعول على أي هعذات،كي على علن بالوخاطز ال اجٌوة عي الذوائز

الكهزبائ ةٍ

وكي على درا ةٌ بالووارسات النقائ ةٍ لو عٌ وقنع أي حادث

استخذم رقن الب إى الو صٌنص ف هًا ةٌ كل تحذ زٌ للعثر تزجوتها

안전을 위한 주의사항

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.

警告!

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.

אַזהָרָה!

יש לקרוא את הוראות התקנה לפני חיבור המערכת למקור מתח.

تحذير!

اقر إرشادات التركيب قبل توصيل النظام إلى مصدر للطاقة

경고!

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.

警告!

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 250 V、20 A。

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 250 V、20 A。

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.

אזהרה!

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

המכשיר המגן מפני הקצר החשמלי הוא לא יותר מ-250 V, 20 A

تحذير!

هذا المنتج يعتمد على معداث الحمايت مه الدوائر القصيرة التي تم تثبيتها في

المبنى

تأكد من أن تقييم الجهاز الوقائي ليس أكثر من : 20 A, 250 V

경고!

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

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 (except for hot-swap components).

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!

יש לנתק את המערכת מכל מקורות החשמל ויש להסיר את כבל החשמלי מהספק

לפני גישה לחלק הפנימי של המארז לצורך התקנת או הסרת רכיבים.

تحذير!

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

انطاقت قبم

انصسل إنى انمناطق انداخهيت نههيكم نتثبيج أو إزانت مكنناث 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 authorized personnel and qualified service persons should be allowed to install, replace, or service this equipment.

警告!

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!

Nur autorisiertes Personal und qualifizierte Servicetechniker dürfen dieses Gerät installieren, austauschen oder warten.

¡Advertencia!

Sólo el personal autorizado y el personal de servicio calificado deben poder instalar, reemplazar o dar servicio a este equipo.

Attention!

Seul le personnel autorisé et le personnel de maintenance qualifié doivent être autorisés à installer, remplacer ou entretenir cet équipement.

אזהרה!

יש לאפשר רק צוות מורשה ואנשי שירות מוסמכים להתקין, להחליף או לטפל בציוד זה.

تحذير!

ينبغي السماح فقط للموظفين المعتمدين وأفراد الخدمة المؤهلين بتركيب هذا الجهاز أو استبداله أو صيانته.

경고!

승인된 직원과 자격을 갖춘 서비스 담당자만이 이 장비를 설치, 교체 또는 서비스할 수 있습니다.

Waarschuwing!

Alleen geautoriseerd personeel en gekwalificeerd onderhoudspersoneel mag deze apparatuur installeren, vervangen of onderhouden.

Rack Stability Hazard

Warning! Stability hazard. The rack may tip over causing serious personal injury. Before extending the rack to the installation position, read the installation instructions. Do not put any load on the slide-rail mounted equipment in the installation position. Do not leave the slide-rail mounted equipment in the installation position.

警告!

安定性に危険があります。ラックが転倒して、重大な人身事故を引き起こす可能性があります。ラックを設置位置まで伸ばす前に、設置手順をお読みください。設置位置にあるスライドレールに取り付けられた機器に負荷をかけないでください。スライドレールに取り付けられた機器を設置位置に放置しないでください。

警告!

稳定性危险。机架可能会翻倒、造成严重的人身伤害。在将机架延伸到安装位置之前、请阅读安装说明。请勿在安装位置对滑轨安装的设备施加任何负载。请勿将滑轨安装的设备留在安装位置。

警告!

穩定性危險。機架可能會翻倒、造成嚴重的人身傷害。將機架延伸至安裝位置前、請先閱讀安裝說明。請勿在安裝位置的滑軌安裝設備上放置任何負載。請勿將滑軌安裝設備留在安裝位置。

Warnung!

Gefahr der Instabilität. Das Rack kann umkippen und schwere Verletzungen verursachen. Lesen Sie die Installationsanweisungen, bevor Sie das Rack in die Einbauposition ausfahren. Belasten Sie die auf den Gleitschienen montierten Geräte nicht in der Einbauposition. Lassen Sie die auf den Gleitschienen montierten Geräte nicht in der Einbauposition.

¡Advertencia!

Peligro de inestabilidad. El rack podría volcarse y causar lesiones personales graves. Antes de extender el rack a la posición de instalación, lea las instrucciones de instalación. No coloque ninguna carga sobre el equipo montado sobre rieles deslizantes en la posición de instalación. No deje el equipo montado sobre rieles deslizantes en la posición de instalación.

Attention!

Danger d’instabilité. Le rack peut basculer et provoquer des blessures corporelles graves. Avant d’étendre le rack en position d’installation, lire les instructions d’installation. Ne pas charger l’équipement monté sur rail de glissière en position d’installation. Ne pas laisser l’équipement monté sur rail de glissière en position d’installation.

אזהרה!

סכנת חוסר יציבות

המתלה עלול להתהפך ולגרום לפציעה חמורה

לפני הארכת המתלה למצב ההתקנה, קרא את הוראות ההתקנה

אין להעמיס כל עומס על הציוד המותקן על מסילת ההחלקה במצב ההתקנה

אל תשאיר את הציוד המותקן על מסילת ההחלקה במצב ההתקנה

تحذير!

خطر عدم الاستقرار.

قد ينقلب الرف مسبباً إصابات جسدية خطيرة.

قبل تمديد الرف إلى موضع التركيب، اقرأ تعليمات التركيب.

لا تضع أي حمولة على الجهاز المثبت على سكة الانزلاق في موضع التركيب.

لا تترك الجهاز المثبت على سكة الانزلاق في موضع التركيب.

경고!

안정성 위험. 랙이 넘어져 심각한 개인 부상을 입을 수 있습니다. 랙을 설치 위치까지 확장하기 전에 설치 지침을 읽으십시오. 설치 위치에서 슬라이드 레일 장착 장비에 하중을 가하지 마십시오. 슬라이드 레일 장착 장비를 설치 위치에 두지 마십시오.

Waarschuwing!

Gevaar voor instabiliteit. Het rek kan kantelen en ernstig persoonlijk letsel veroorzaken. Lees de installatie-instructies voordat u het rek uitschuift naar de installatiepositie. Plaats geen last op de op de glijrail gemonteerde apparatuur in de installatiepositie. Laat de op de glijrail gemonteerde apparatuur niet in de installatiepositie staan.

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).

警告!

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.

אזהרה!

יש להתקין את היחידה באזורים שיש בהם הגבלת גישה. הגישה ניתנת בעזרת

'כלי אבטחה בלבד (מפתח, מנעול וכד.)

تحذير!

اتخصيص هذه انحذة نترك بُها ف مناطق محظورة تم .

مَكن انصل إن منطقت محظورة فقط من خلال استخذاو أداة خاصت،

أو أ وس هُت أخري نلاأمما 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 risk of explosion if the battery is replaced by an incorrect type. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

警告!

バッテリーを間違ったタイプに交換すると爆発の危険があります。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!

如果更换的电池类型不正确。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!

如果更換的電池類型不正確。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!

Es besteht Explosionsgefahr, wenn die Batterie durch einen falschen Typ ersetzt wird. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.

¡ADVERTENCIA!

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

ATTENTION!

Il existe un risque d'explosion si la batterie est remplacée par un type incorrect. 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.

אזהרה!

קיימת סכנת פיצוץ אם הסוללה תוחלף בסוג שגוי. יש להחליף

את הסוללה בסוג התואם מחברת יצרן מומלצת.

סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

تحذير!

.هناك خطر الانفجار إذا تم استبدال البطارية بنوع غير صحيح

اسحبذال البطارية

فقط بنفس النبع أو ما يعادلها مما أوصث به الشرمة المصنعة

جخلص من البطاريات المسحعملة وفقا لحعليمات الشرمة الصانعة

경고!

배터리를 잘못된 종류로 교체하면 폭발의 위험이 있습니다. 기존 배터리와 동일하거나 제조사에서 권장하는 동등한 종류의 배터리로만 교체해야 합니다. 제조사의 안내에 따라 사용된 배터리를 처리하여 주십시오.

WAARSCHUWING!

Er bestaat explosiegevaar als de batterij wordt vervangen door een verkeerd type. 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.

警告!

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.

אזהרה!

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

את היחידה.

تحذير!

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.

警告!

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.

אזהרה!

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

העבודה.

تحذير!

هناك خطز مه التيار الكهزبائي أوالطاقة المىجىدة على اللىحة

عندما يكىن 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.

警告!

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.

אזהרה!

התקנת הציוד חייבת להיות תואמת לחוקי החשמל המקומיים והארציים.

تحذير!

تركيب المعدات الكهربائية يجب أن يمتثل للقناويه المحلية والبطنية 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.

警告!

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.

אזהרה!

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

تحذير!

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

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.

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

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 והמאווררים עדיין עובדים. יש להרחיק למרחק בטוח את

האצבעות וכלי עבודה שונים מהפתחים בתוך המאוורר

تحذير!

تحذير! أجزاء متحركة خطرة. ابتعد عن شفرات المروحة المتحركة.من الممكن أن

المراوح لا تزال تدور عند إزالة كتلة المروحة من الهيكل يجب إبقاء الأصابع

ومفكات البراغي وغيرها من الأشياء بعيدا عن الفتحات في كتلة المروحة.

경고!

움직이는 위험한 부품. 회전하는 송풍 날개에 접근하지 마세요. 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.

警告!

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.

אזהרה!

ךרוצל ומאתוה וא ושכרנ רשא AC ימאתמו יקיפס ,ילבכב שמתשהל שי ,רצומה תא יניקתמ רשאכ לכב שומיש . עקתהו לבכה לש הנוכנ הדימ ללוכ ,תוימוקמה תוחיטבה תושירדל ומאתוה רשאו ,הנקתהה למשחה ירישכמב שומישה יקוחל םאתהב .ילמשח רצק וא הלקתל סורגל לולע ,רחא גוסמ םאתמ וא לבכ לש דוק סהילע עיפומ רשאכ) CSA- ב וא UL - ב יכמסומה ילבכב שמתשהל רוסיא ייק ,תוחיטבה יקוחו דבלב Supermicro י"ע םאתוה רשא רצומב קר אלא ,רחא ילמשח רצומ לכ רובע UL/CSA).

تحذير!

تالباكلا ءارشب مق وأ ةددحملا وأ ةرفوتملا تاليصوتلا مادختساب مق ،جتنملا بيكرت دنع

كلذ يف امب ةيلحملا ةمالسلا تابلطتمو نيناوقب مازتلالا عم ددرتملا رايتلا تالوحمو ةيئابر هكلا

قيرح وأ لطع يف ببستي دق برخأ تالوحمو تالباك يأ مادختسا .ميلسلا سباقلاو لصوملا مجح.

CSA وأ UL لبق نم ةدمتعملا تالباكلا مادختسا تادعملاو ةيئابر هكلا تز هجألل ةمالسلا نوناق رظحي

Supermicro لبق نم ةددحملاو ةينعملا تاجتنملا ريغ برخأ تادعم يأ عم (UL/CSA) ةمالع لمحت يتلاو.

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.

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 Intel® Xeon® 6900-series processors with P-cores (Socket BR LGA 7529), with six UPIs (24 GT/s maximum per UPI link) and a thermal design power of up to 500 W
Chipset
System on Chip
BIOS
AMI 64 MB SPI Flash
Memory
24 DIMM slots that support ECC DDR5 memory with speeds of up to 6400 MT/s (1DPC), or MR DIMM DDR5 memory with speeds of up to 8800 MT/s (1DPC or 1 slot per channel). Memory speed/capacity support depends on the processors used in the system.
GPU
NVIDIA SXM: HGX B200 8-GPU
Storage Drives
10 front hot-swap 2.5" PCIe 5.0 x4 NVMe drive bays Two M.2 PCIe 4.0 x4 NVMe slots (M-key 2280/22110)
PCI Expansion Slots
Two PCIe 5.0 x16 FHHL slots 10 PCIe 5.0 x16 LP slots **Note:** Slot 1 is for PCIe 5.0 x16 (with 8x bandwidth). Slots 2–9 are for east-west backend NICs.
Input/Output
Two USB 3.0 ports (front) One VGA port (front) Dual BMC RJ45 ports (rear) One dedicated IPMI port (rear) One TPM header
Motherboard
MBD-X14DBG-DAP; proprietary, (WxL) 17" x 16.165" (43.18 x 41.06 cm)
Chassis
CSE-GP1001TS; (WxHxD) 1.76" x 17.2" x 33.2" (449 x 438.8 x 843.28 mm)
System Cooling
19 counter-rotating 80 x 80 x 38-mm fan(s)

Power Supply
Six 5250 W redundant (3 + 3) power supplies
Operating Environment
Operating Temperature: 10°C ~ 35°C (50°F ~ 95°F)
Non-operating Temperature: -40°C to 70°C (-40°F to 158°F)
Operating Relative Humidity: 8% to 90% (non-condensing)
Non-operating Relative Humidity: 5% to 95% (non-condensing)
Regulatory Compliance
FCC, ICES, CE, VCCI, RCM, UKCA, NRTL, CB
Certified Safety Models
GP1001-H52X14

Applied Directives, Standards

Directives:

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

CISPR 32

CISPR 35

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

Environment:

Delegated Directive (EU) 2015/863

Directive 2011/65/EU (RoHS)

REACH Regulation EC 1907/2006

WEEE Directive 2012/19/EU

California Proposition 65

Product Safety:

2014/35/EU (LVD Directive)

UL/CSA 62368-1 (USA and Canada)

Electrical Equipment (Safety) Regulations 2016

IEC/BS/EN 62368-1

Perchlorate Warning

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