



OPEN Industry Standard, Flexible Architecture

GREEN Less Heat, Less Power Consumption

STABLE Robust Design, Quality Parts

Stable and
Reliable Solution

Server/Workstation
Motherboard

4U8G Series

4U10G Series

User Manual

English



Version 1.0

Published March 2022

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This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

CALIFORNIA, USA ONLY

The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.

“Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate”

ASRock Rack's Website: www.ASRockRack.com

Setting up the Server in a Restricted Access Location

- Access can only be gained by service persons or by users who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken.
- Access is through the use of a tool or lock and key, or other means of security, and is controlled by the authority responsible for the location.
- Leave enough clearance (25 inches in the front and 30 inches in the back of the rack) to allow the front door to be opened completely and to allow for sufficient airflow.
- This product is for installation merely in a Restricted Access Location.
- This product is not suitable for use with visual display work place devices according to §2 of the the German Ordinance for Work with Visual Display Units.

Replaceable Batteries

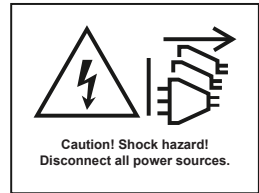
CAUTION

**RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS**

Warning

When removal of the chassis lid required for servicing:

- Turn off power and unplug any power cords/cables, and
- Reinstall the chassis lid before restoring power.



Important Safety Instructions

Pay close attention to the following safety instructions before performing any of the operation. Basic safety precautions should be followed to protect yourself from harm and the product from damage:

- Operation of the product should be carried out by suitably trained, qualified, and certified personnel only to avoid risk of injury from electrical shock or energy hazard.
- Disconnect the power cord from the wall outlet when installing or removing main system components, such as the motherboard and power supply unit.
- Place the system on a stable and flat surface.
- Use extreme caution when working with high-voltage components.
- When handling parts, use a grounded wrist strap designed to prevent static discharge.
- Keep the area around the system clean and clutter-free.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags when not in use.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.

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Chapter 1 Introduction

Thank you for purchasing 4U8G / 4U10G Series, a reliable barebone system produced under ASRock Rack's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock Rack's commitment to quality and endurance.



*Because the hardware specifications might be updated, the content of this documentation will be subject to change without notice. In case any modifications of this documentation occur, the updated version will be available on ASRock Rack's website without further notice. If you require technical support related to this product, please visit our website for specific information about the model you are using.
ASRock Rack's Website: www.ASRockRack.com*



The illustrations shown in this manual are examples only, the actual system may differ slightly .

1.1 Shipping Box Contents

| Item | Quantity | |
|--------------------------------|-------------|--------------|
| | 4U8G Series | 4U10G Series |
| 4U8G/4U10G Series Barebone | 1 | 1 |
| System Boards (MB) | 1 | 1 |
| Power Supply Unit (PSU) | 4 | 4 |
| Rear System Fans | 5 | 5 |
| Middle System Fans | 5 | 5 |
| HDD Backplane (BPB) | 1 | 1 |
| Rear Panel Board | 1 | 1 |
| Power Distribution Board (PDB) | 1 | 1 |
| Rear Fan Board | 1 | 1 |
| Middle Fan Board | 1 | 1 |
| Switch Board (SWB) | 1 | 1 |
| Accessory Box | 1 | 1 |
| Quick Installation Guide | 1 | 1 |
| Rail Assembly Kit | 1 | 1 |



If any items are missing or appear damaged, contact your authorized dealer.

1.2 Specifications

| 4U8G / 4U10G Series | |
|--------------------------|--|
| System Physical Status | |
| Form Factor | 4U Rackmount |
| Dimension (D x W x H) | 438mm x 780mm x 176.5mm (L/W/H) 438mm x 870mm x 176.5mm (L/W/H, with external fans) |
| Support MB Size | Proprietary 16.53" x 14.56" |
| Front Panel | |
| Buttons | <ul style="list-style-type: none"> • Power On/Standby button • System reset button • NMI button |
| LEDs | <ul style="list-style-type: none"> • Power LED • Hard drive activity LED • 2 x Network activity LED • System event LED |
| I/O Ports | 4 x USB 3.2 Gen1 ports |
| Drive Bay | |
| External | 12 x 3.5" SATA HDDs (6Gb/s) / 24 x 2.5" SATA HDDs (6Gb/s) (4U8G-ROME2/2T-24S only) |
| System Cooling | |
| Fan | 5 x 8038 Chassis FAN(Hot swap) (External) 5 x 8080 Chassis FAN(Hot swap) (Internal) |
| Power Supply | |
| Capacity | 4 (3+1), Redundant |
| Output Watts | 1600W CRPS PSU @ 200Vac~240Vac / |
| System Switch Board | |
| Switch IC | PEX88096 |
| GPGPU Card | |
| GPGPU Watts | Max 300w /per card |
| Support GPU | 4U8G Series: 8 x GPU cards 4U10G Series: 10 x GPU cards |

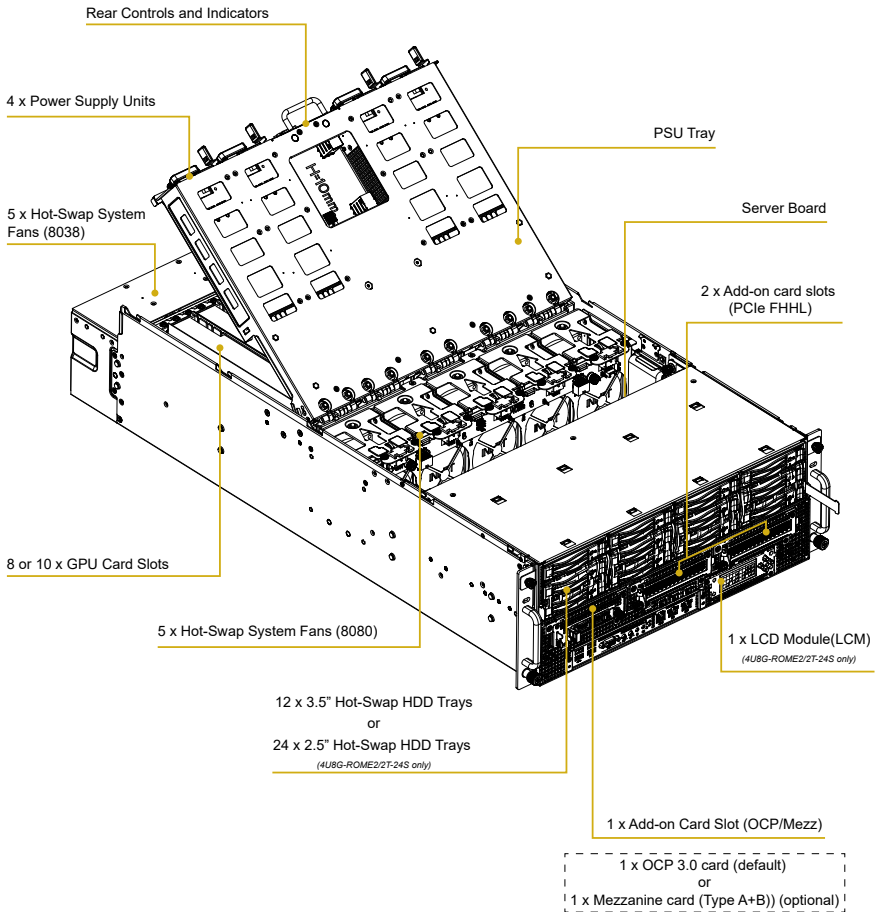


Please refer to the user manual of the motherboard you use for detailed information about motherboard components and features.

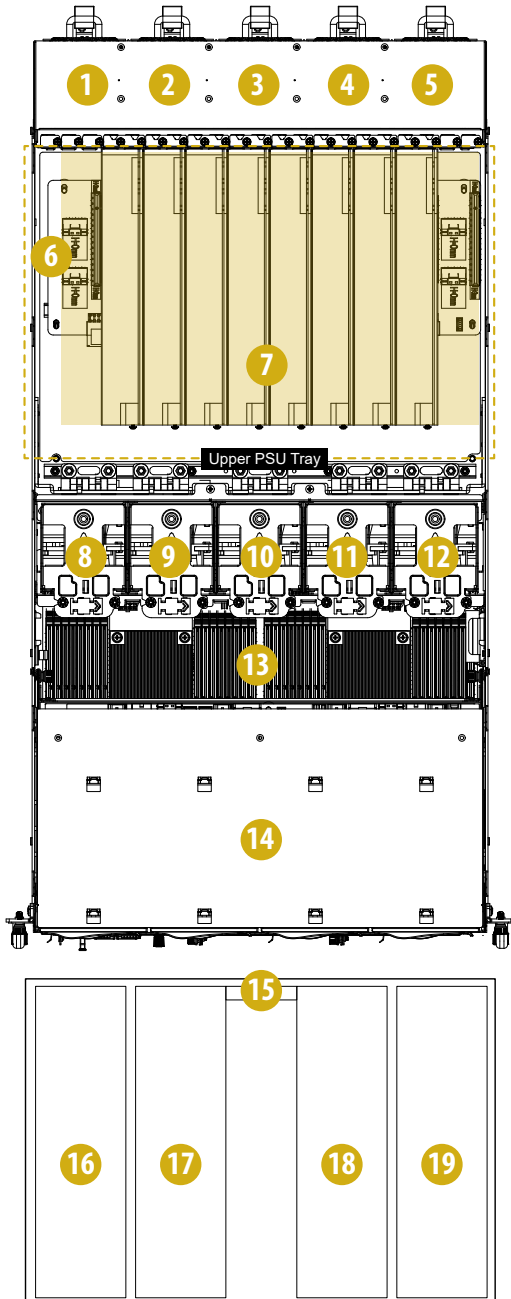
Chapter 2 Server System Overview

This chapter provides diagrams showing the location of important components of the server system.

2.1 System Components



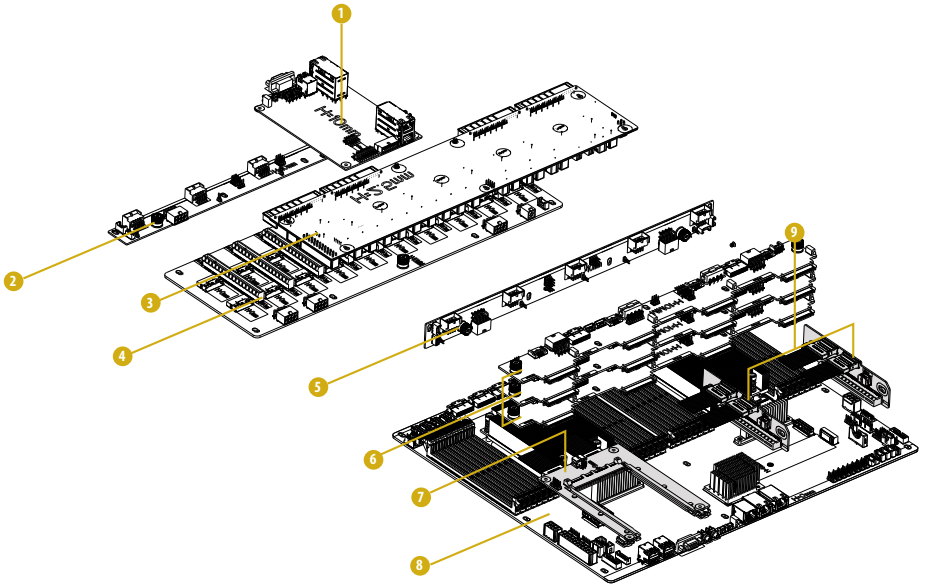
2.2 Internal Features



Upper PSU Tray

| No. | From |
|-----|---|
| 1 | Rear System Fan 1 |
| 2 | Rear System Fan 2 |
| 3 | Rear System Fan 3 |
| 4 | Rear System Fan 4 |
| 5 | Rear System Fan 5 |
| 6 | Switch Board (SWB) |
| 7 | 4U8G Series: 8 x GPU Card Slot 4U10G Series: 10 x GPU Card Slot |
| 8 | System Fan 1 |
| 9 | System Fan 2 |
| 10 | System Fan 3 |
| 11 | System Fan 4 |
| 12 | System Fan 5 |
| 13 | Serverboard |
| 14 | 12 x 3.5" Hot-swap HDD trays or 24 x 2.5" Hot-swap HDD trays (<i>4U8G-ROME2/2T-24S only</i>) |
| 15 | Rear Control Panel (on the PSU tray) |
| 16 | Power Supply 4 (on the PSU tray) |
| 17 | Power Supply 3 (on the PSU tray) |
| 18 | Power Supply 2 (on the PSU tray) |
| 19 | Power Supply 1 (on the PSU tray) |

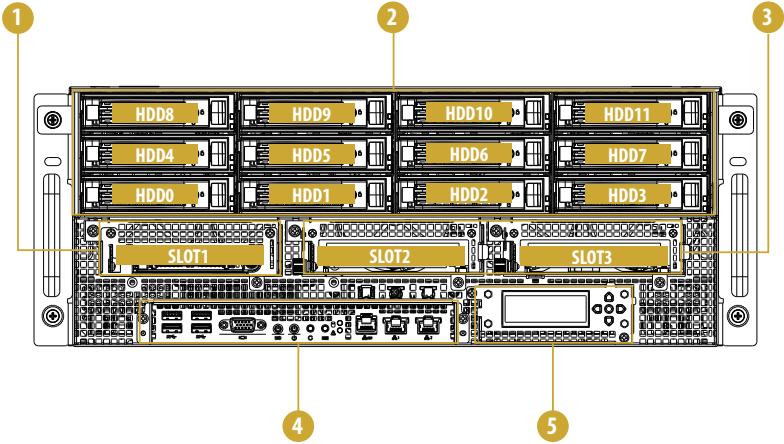
2.3 Board Arrangement



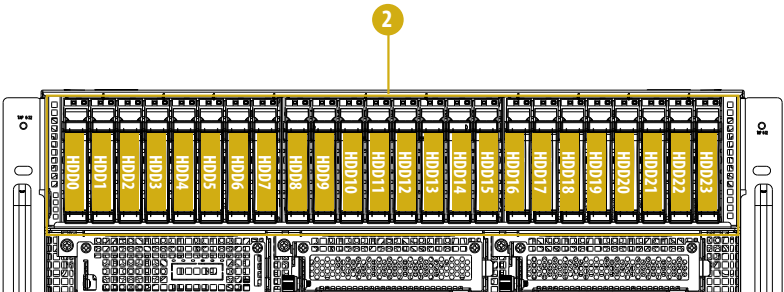
| No. | Item |
|-----|--|
| 1 | Rear Panel Board |
| 2 | Rear Fan Board |
| 3 | Power Distribution Board (PDB) |
| 4 | Switch Board (SWB) |
| 5 | Middle Fan Board |
| 6 | HDD Backplane Board (BPB) |
| 7 | Add-on Card Module (for an OCP 3.0 card (SL2OCP3) or a mezzanine card (SL2M(Type A+B))) |
| 8 | Serverboard |
| 9 | Riser Cards (SL2P) (for FHHL PCIe cards) |

2.4 System Front Panel

4U8G / 4U10G Series

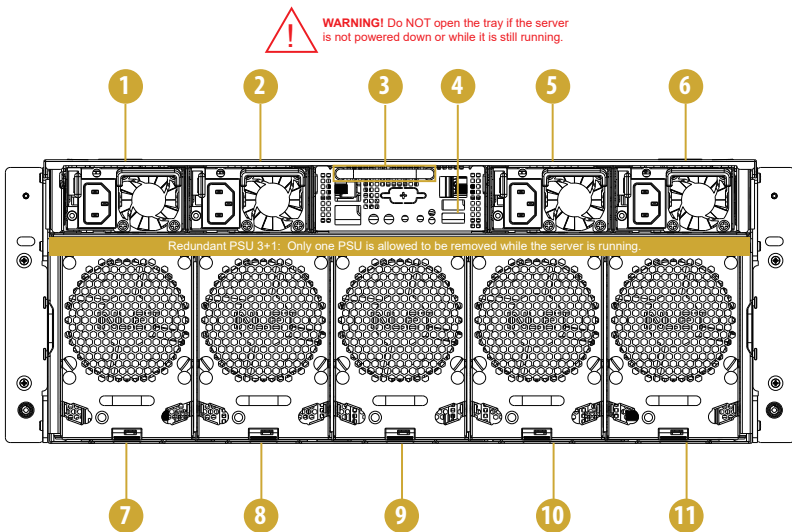


4U8G-ROME2/2T-24S only:



| No. | Description |
|-----|--|
| 1 | 1 x Add-on Card Slot (for 1 x OCP 3.0 card (default) or 1 x Mezzanine card (Type-A+B) (optional)) |
| 2 | 12 x 3.5" HDD trays or 24 x 2.5" HDD trays (<i>4U8G-ROME2/2T-24S only</i>) |
| 3 | 2 x Add-on Card Slots (for 2 x FHHL PCIe cards) |
| 4 | I/O Shield (depends on the specification of the server board) |
| 5 | 1 x LCD Module (LCM) (<i>4U8G-ROME2/2T-24S only</i>) |

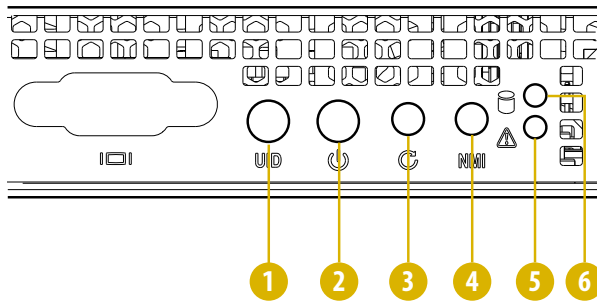
2.5 System Rear Panel



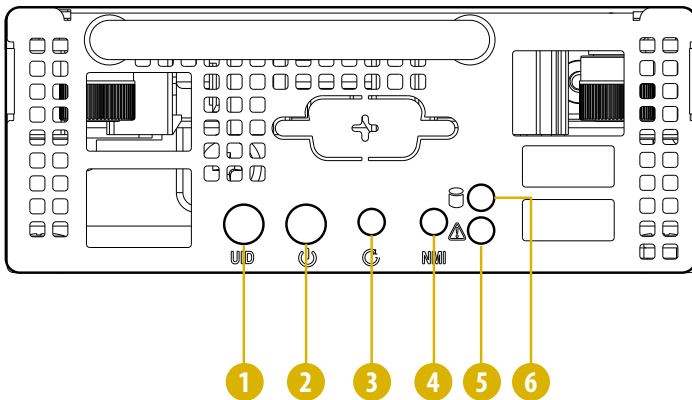
| No. | Description |
|-----|--|
| 1 | Power Supply Unit 1 (Redundant PSU 3+1) <i>*Server requires 3 working PSUs, with 1 redundant PSU. You must have at least three active supplies, installed, functioning and connected to AC. Only one of the PSUs is allowed to be removed while the server is running..</i> |
| 2 | Power Supply Unit 2 (Redundant PSU 3+1) <i>*Server requires 3 working PSUs, with 1 redundant PSU. You must have at least three active supplies, installed, functioning and connected to AC. Only one of the PSUs is allowed to be removed while the server is running..</i> |
| 3 | PSU Tray Handle |
| 4 | Control Panel |
| 5 | Power Supply Unit 3 (Redundant PSU 3+1) <i>*Server requires 3 working PSUs, with 1 redundant PSU. You must have at least three active supplies, installed, functioning and connected to AC. Only one of the PSUs is allowed to be removed while the server is running..</i> |
| 6 | Power Supply Unit 4 (Redundant PSU 3+1) <i>*Server requires 3 working PSUs, with 1 redundant PSU. You must have at least three active supplies, installed, functioning and connected to AC. Only one of the PSUs is allowed to be removed while the server is running..</i> |
| 7 | Rear System Fan 1 |
| 8 | Rear System Fan 2 |
| 9 | Rear System Fan 3 |
| 10 | Rear System Fan 4 |
| 11 | Rear System Fan 5 |

2.6 Control Panel Buttons and LEDs

Front Control Panel



Rear Control Panel



| No. | Description |
|-----|------------------------------------|
| 1 | UID Button and LED |
| 2 | Power Button and LED |
| 3 | System Reset Button |
| 4 | NMI (Nonmaskable Interrupt) Button |
| 5 | HDD Activity LED |
| 6 | System Event LED |

**Please be noted that certain functions are supported depending on the type of the server board.*

Power Button

Press the power switch button to toggle the system power on and standby/sleep modes. To remove all power from the system completely, disconnect the power cord from the server.

UID Button

Press the ID button to toggle the front panel UID LED and the baseboard UID LED on and off. You are able to locate the server you're working on from behind a rack of servers.

NMI (Nonmaskable Interrupt) Button

Press the NMI button with a paper clip or pin to generate a nonmaskable interrupt and to put the server in a halt state for examination.

System Reset Button

When the system is completely unresponsive, press the system reset button to reboot the server without shutting it off and initialize the system.

Status LED Definitions

| Power LED | |
|-----------|-------------|
| Status | Description |
| Green | Power on |
| Off | Power off |

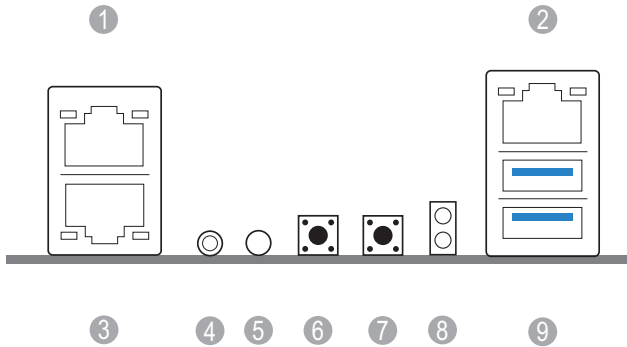
| UID LED | |
|---------|------------------------------------|
| Status | Description |
| Blue | System identification is active. |
| Off | System identification is disabled. |

| HDD Activity LED | |
|------------------|-------------|
| Status | Description |
| Blinking Green | HDD access |
| Off | HDD idle |

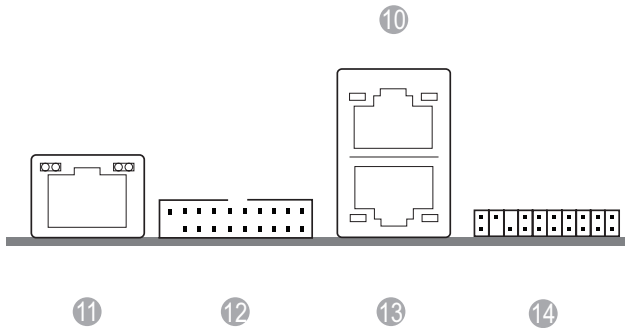
| System Event LED | |
|------------------|--|
| Status | Description |
| Off | Running or normal operation |
| Red | At least one sensor has critical alert |

2.7 I/O Ports on the I/O Board (4UXG_IOB)

Rear Side of IOB



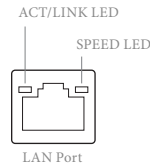
Front Side of IOB



| No. | Description | No. | Description |
|-----|--------------------------------|-----|-------------------------------------|
| 1 | 1G LAN RJ-45 Port (LAN_1)*** | 8 | HDD/System Event LED (HDD_SYS_LED) |
| 2 | IPMI LAN (IPMI_LAN)* | 9 | USB 3.2 Gen1 Ports (USB3_1_2) |
| 3 | UID Button (UID1) | 10 | 1G LAN RJ-45 Port (LAN_2)*** |
| 4 | 1G LAN RJ-45 Port (LAN_3)*** | 11 | IPMI LAN (IPMI1)** |
| 5 | Power Button (PWR_BTN1) | 12 | USB 3.2 Gen1 Header (USB3_1_2) |
| 6 | System Reset Button (RST_BTN1) | 13 | 1G LAN RJ-45 Port (LAN_1)*** |
| 7 | NMI Button (NMI_BTN1) | 14 | Auxiliary Panel Header (AUX_PANEL1) |

LAN Port LED Indications

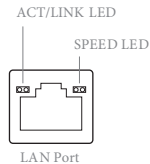
*There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.



Dedicated IPMI LAN Port LED Indications

| Activity / Link LED | | Speed LED | |
|---------------------|---------------|-----------|------------------------------|
| Status | Description | Status | Description |
| Off | No Link | Off | 10Mbps connection or no link |
| Blinking Yellow | Data Activity | Yellow | 100Mbps connection |
| On | Link | Green | 1Gbps connection |

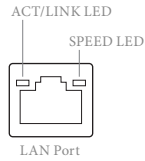
**There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.



Dedicated IPMI LAN Port LED Indications

| Activity / Link LED | | Speed LED | |
|---------------------|---------------|-----------|------------------------------|
| Status | Description | Status | Description |
| Off | No Link | Off | 10Mbps connection or no link |
| Blinking Yellow | Data Activity | Yellow | 100Mbps connection |
| On | Link | Green | 1Gbps connection |

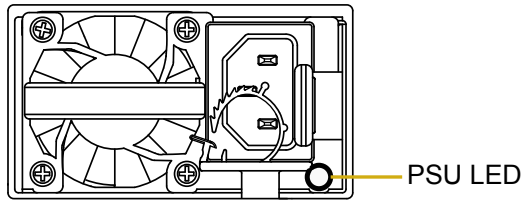
***There are two LED next to the LAN port. Please refer to the table below for the LAN port LED indications.



1G LAN Port LED Indications

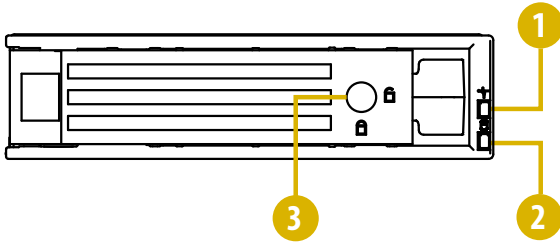
| Activity / Link LED | | Speed LED | |
|---------------------|---------------|-----------|------------------------------|
| Status | Description | Status | Description |
| Off | No Link | Off | 10Mbps connection or no link |
| Blinking Green | Data Activity | Orange | 100Mbps connection |
| On | Link | Green | 1Gbps connection |

2.8 PSU LED



| PSU Status LED | |
|-------------------------|---|
| Status | Description |
| Green | Normal work; output ON and OK |
| Amber | Module fault/protection in operating mode (failure, OCP, OVP, Fan Fail, OTP, UVP) AC cord unplugged |
| Amber blinking at 0.5Hz | Warning (high temp, high power, high current, slow fan) |
| Green blinking at 0.5Hz | AC Present Only 12VSB on (PS off) or PS in Smart Redundant state |

2.9 Drive Tray LEDs & Lock



| No. | Description |
|-----|------------------|
| 1 | HDD Power LED |
| 2 | HDD Activity LED |
| 3 | HDD Tray Lock |

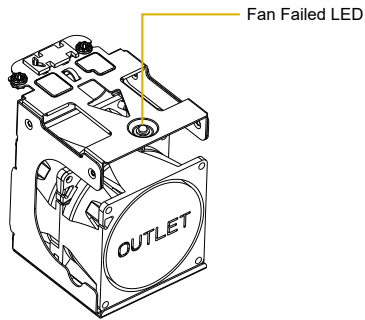
Status LED Definitions

| HDD Power LED | |
|---------------|-----------------|
| Status | Description |
| Blue | HDD powered-on |
| Off | No power to HDD |

| HDD Activity LED | |
|------------------|--------------------------|
| Status | Description |
| Solid Green | HDD active |
| Blinking Green | HDD accessing or reading |
| Red | HDD failed |
| Off | HDD powered-off |

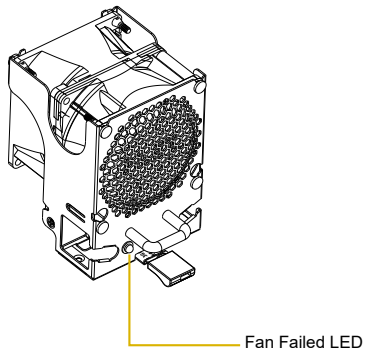
2.10 Fan Failed LED

Middel Fan



| Fan LED | |
|-----------|-------------|
| Status | Description |
| Solid Red | Fan failed |
| Off | Normal |

Rear Fan



| Fan LED | |
|-----------|-------------|
| Status | Description |
| Solid Red | Fan failed |
| Off | Normal |

Chapter 3 Hardware Installation and Maintenance

This chapter helps you assemble the chassis and install components.

Before You Begin

Before you work with the server, pay close attention to the “Important Safety Instructions” at the beginning of this manual.

1. Make sure the server is powered off.

Power down the server if it is still running.

- (1) Press the Power button to power off the server from full-power mode to standby-power (sleep) mode. The Power LED at the front turns from solid green to blinking green.
- (2) Disconnect the power cord first from the AC outlet and then from the server. The power LED turns off.



The server is not completely powered down when you press the Power button on the front panel. The Power button lets the server toggle between Power On and Standby (Sleep) modes. Some internal circuitry remain active in the Standby mode. To remove all power from the system completely, be sure to disconnect the power cord from the server.

2. Ensure you have a clean and stable working environment. Avoid dust and dirt because contaminants may cause malfunctions.
3. Ground yourself properly before touching any system component. A discharge of static electricity may damage components. Wear a grounded wrist strap if available.

Installing Procedures

The followings are prerequisite to be installed.

- 3.5" or 2.5" HDD(s)
- Power Supply Units (Pre-installed)
- System Fans (Pre-installed)
- Server Board (Pre-installed)
- HDD Backplane (Pre-installed)
- Switch Board (Pre-installed)
- Power Distribution Board (Pre-installed)



1. Some components are already pre-installed. Simply properly connect the relevant cables before or after installation. See the Quick Installation Guide for more details.
2. Refer to the user manual of the server board you use for instructions on how to install server board components.

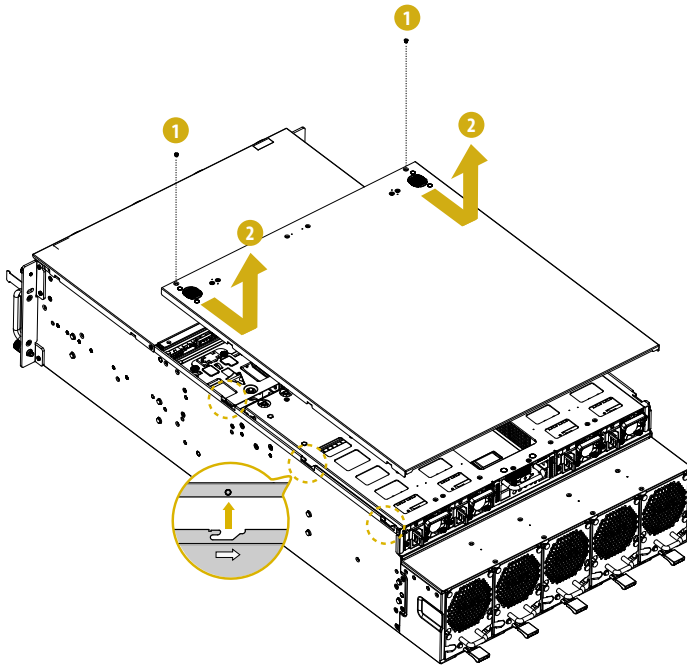
3.1 Server Top Cover

Removing the Server Top Covers

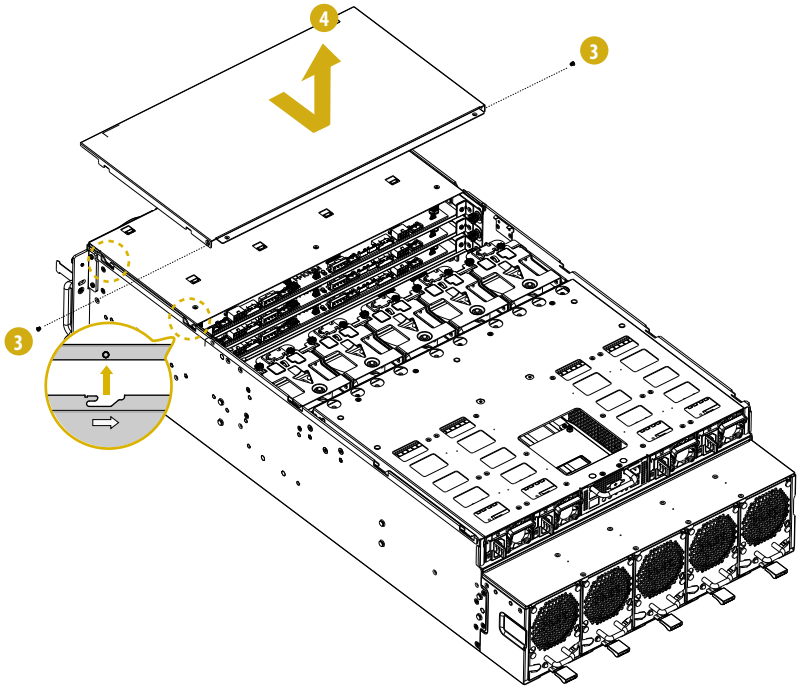


1. Before removing the top covers, power off the server and unplug the power cord.
2. The system must be operated with all the chassis top covers installed to ensure proper cooling.

1. Remove the screws that secure the top rear cover to the chassis.
2. Press the tabs and push straight back to remove the cover from the locked position. Then lift up and remove the cover.

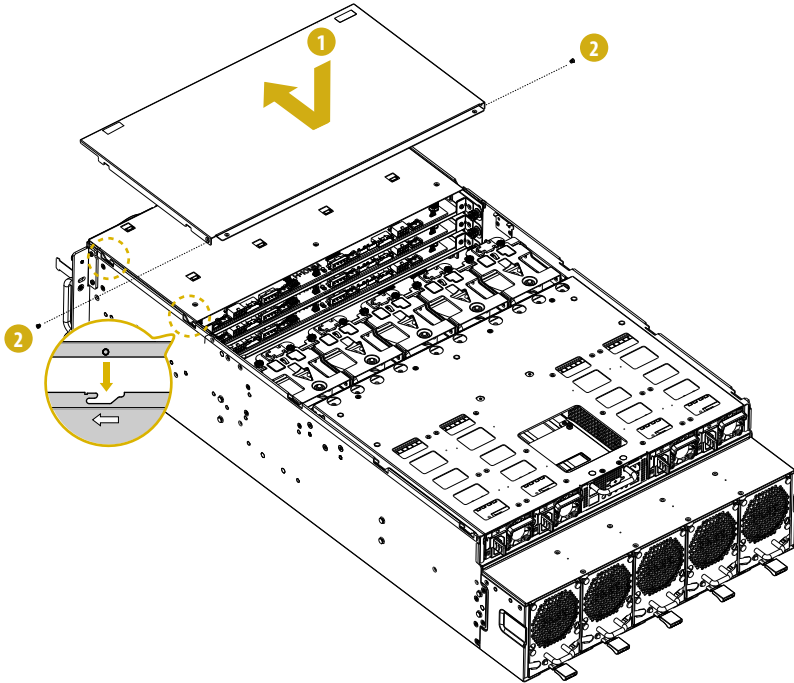


3. Remove the screws that secure the top front cover to the chassis.
4. Push straight back to remove the cover from the locked position. Then lift up and remove the cover.

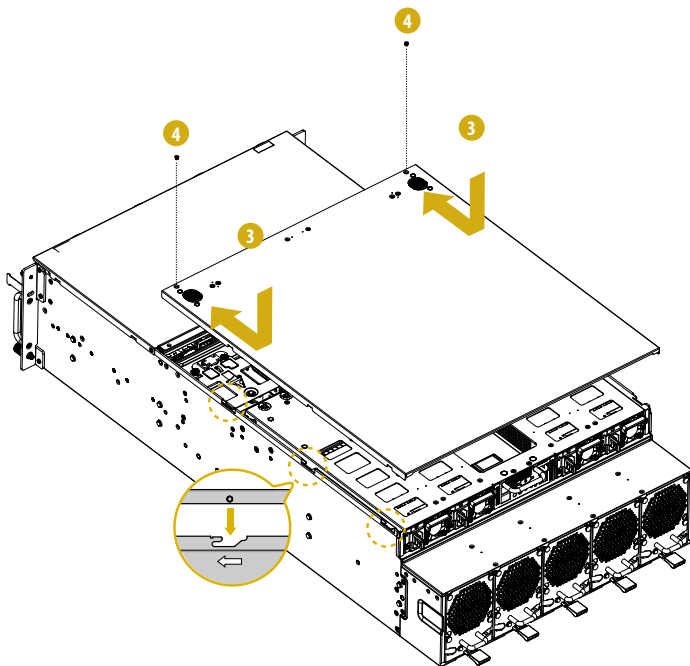


Installing the Server Top Covers

1. Lower the top front cover on the chassis, making sure the side latches align with the cutouts.
2. Slide the top cover toward the FRONT of the chassis. Then secure the top cover with the screws.



3. Lower the top rear cover on the chassis, making sure the side latches align with the cutouts.
4. Slide the top cover toward the FRONT of the chassis. Then secure the top cover with the screws.



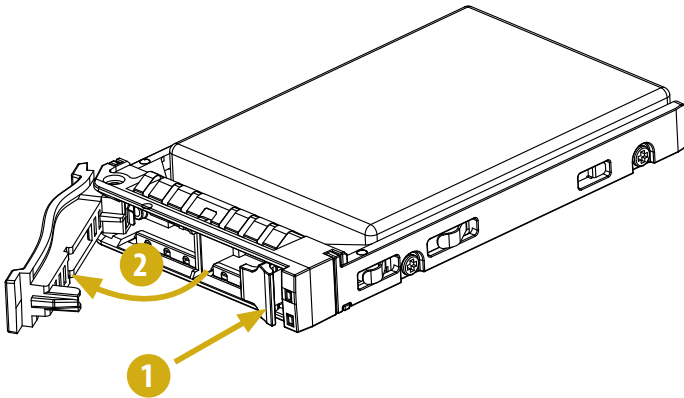
3.2 Hard Drive

3.2.1 Installing a Hard Disk Drive into 2.5" or 3.5" Hard Drive Tray

The system supports hot-swappable 3.5" or 2.5" hard drives. The hard drive trays are located on the front of the chassis.

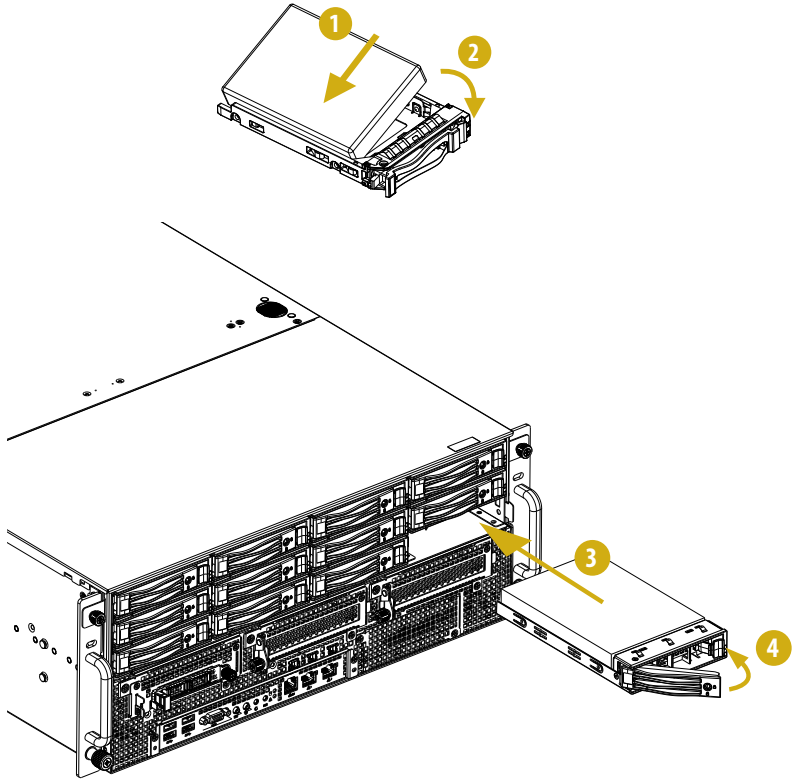
Removing Hard Drive Trays from the Chassis

1. Press the locking lever latch on the drive tray to unlock the retention lever.
2. Rotate the lever out and away from the module bay and pull the hard drive out of the HDD tray.



Installing a Hard Drive to the Hard Drive Tray

1. Engage two embossed pins into the side dimples on the tray.
2. Carefully push down the other side of the tray until the other two embossed pins and side dimples lock into place.
3. Slide the drive tray into the HDD bay until the drive is fully seated.
4. Push in the locking lever to lock the HDD tray into place.



3.3 Power Supply

The system can accommodate four AC or two DC power supplies in the bay at the rear of the chassis. Each unit provides up to 1600 Watts (200V AC) of power. Three power supplies are required for full load operation, with the fourth power supply purely as a redundant, load-sharing backup. It can be removed without affecting system operation.

Installing and Removing the Power Supply

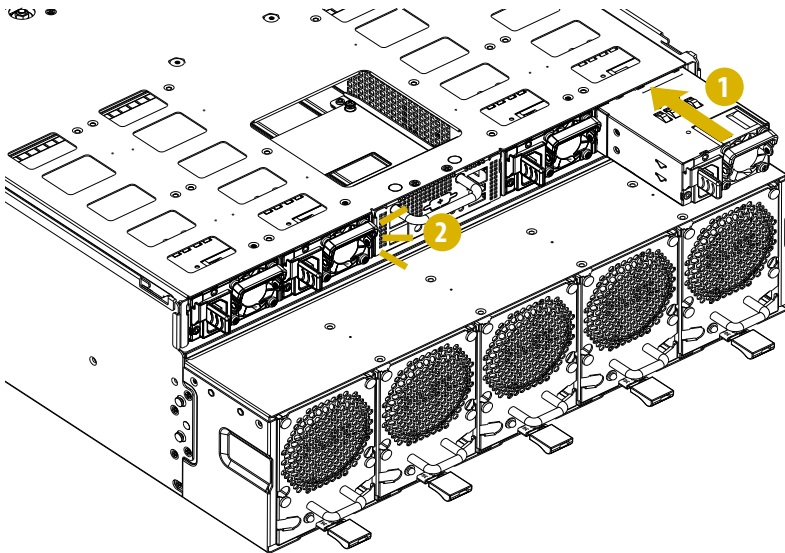


Before replacing the power supply, power off the server, unplug the power cord, and disconnect all wiring from the power supply.

Installing the Power Supply Unit

Align the power supply unit with the power supply slot. Ensure that the LED appears on the lower right when you are installing the power supply unit.

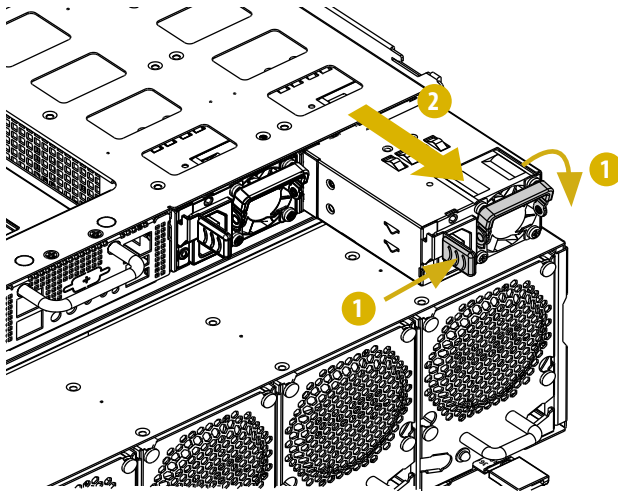
1. Carefully slide the PSU all the way into the power supply bay.
2. Make sure the power supply clicks into place and is well installed.



Removing the Power Supply Unit

To remove a failed power supply, identify the failed power supply by checking the power supply LEDs on the PSU.

1. Hold onto the power supply handle while pressing the locking lever towards the power supply handle.
2. Pull to remove the power supply from the chassis.



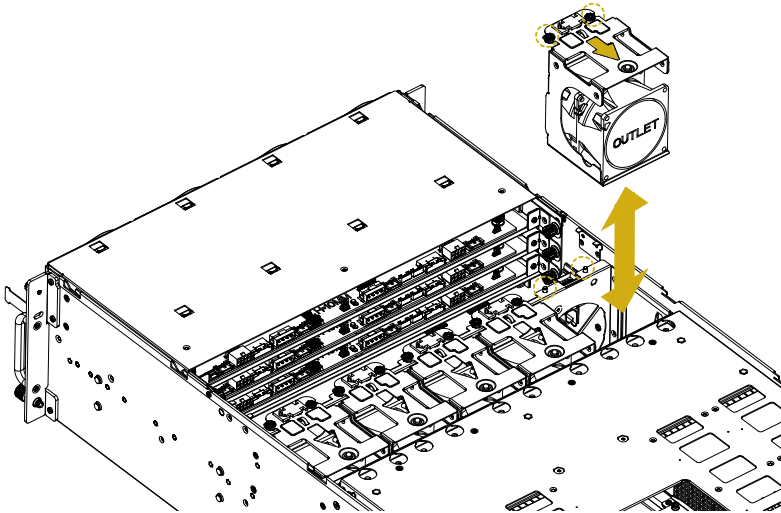
1. Before replacing the power supply, power off the server, unplug the power cord, and disconnect all wiring from the power supply.
2. In a redundant system, you do not need to power down the server.

3.4 System Fan

The system supports hot-swappable system fans.

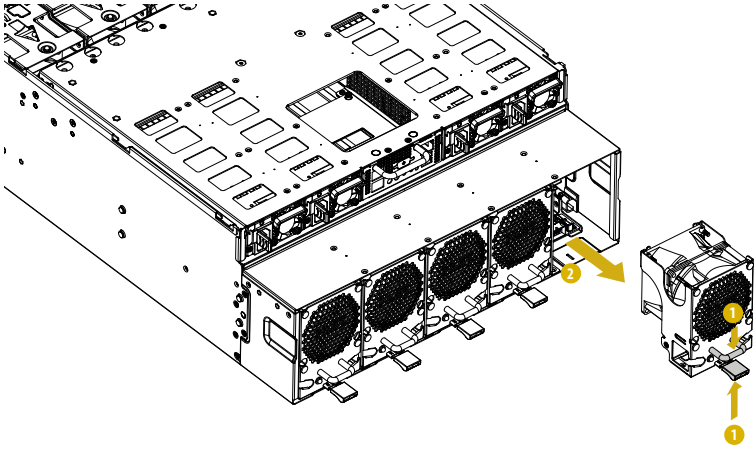
Replacing the System Fan (Middle)

1. Lift to remove the failed fan.
2. Align the mounting holes on the replacement fan corners with the fan mounts on the fan bracket.
3. Make sure the arrow on the fan pointed to the REAR of the chassis.
4. Gently place the fan onto the mounts.
5. Make sure the fan is well seated.

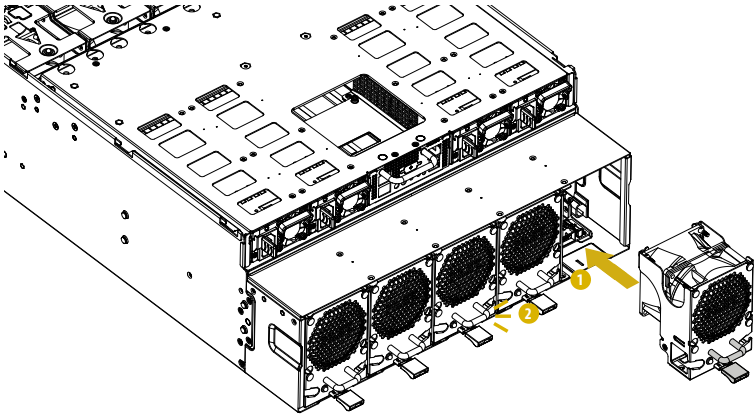


Replacing the System Fan (Rear)

1. Hold onto the fan handle while pressing the locking lever towards the handle.
2. Pull to remove the failed fan.



3. Carefully slide the fan all the way into the rear fan bay.
4. Make sure the fan clicks into place and is well installed.



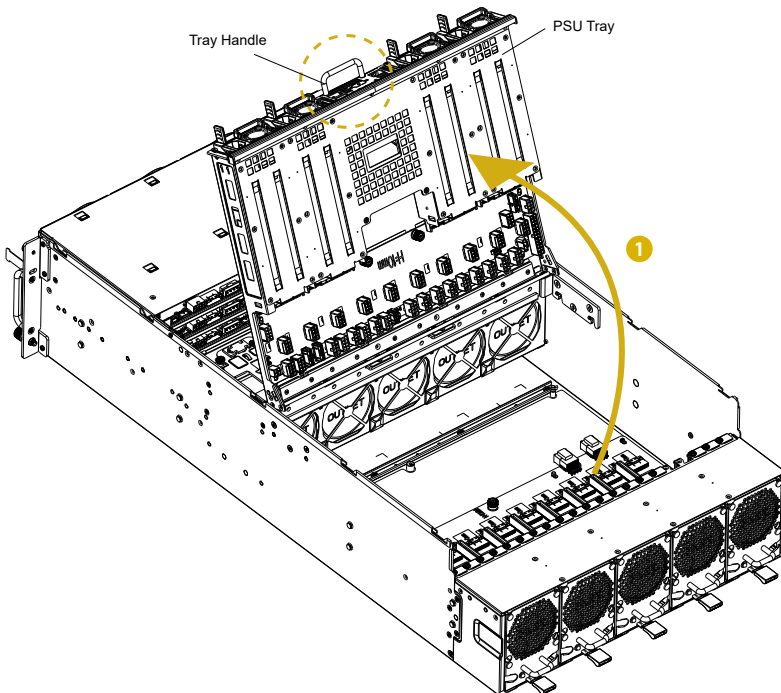
3.5 GPU Card

Installing and Removing the GPU Card

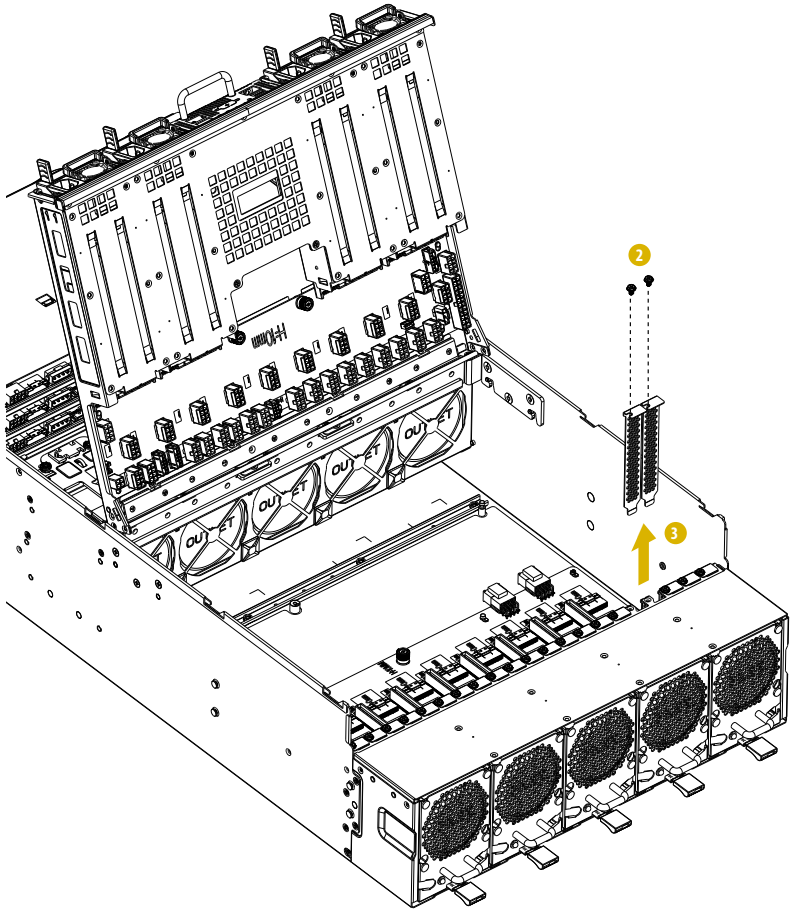


*The GPU cards are located under the power supplies.
Before accessing any GPU cards, make sure you power off the server and properly open the PSU tray.*

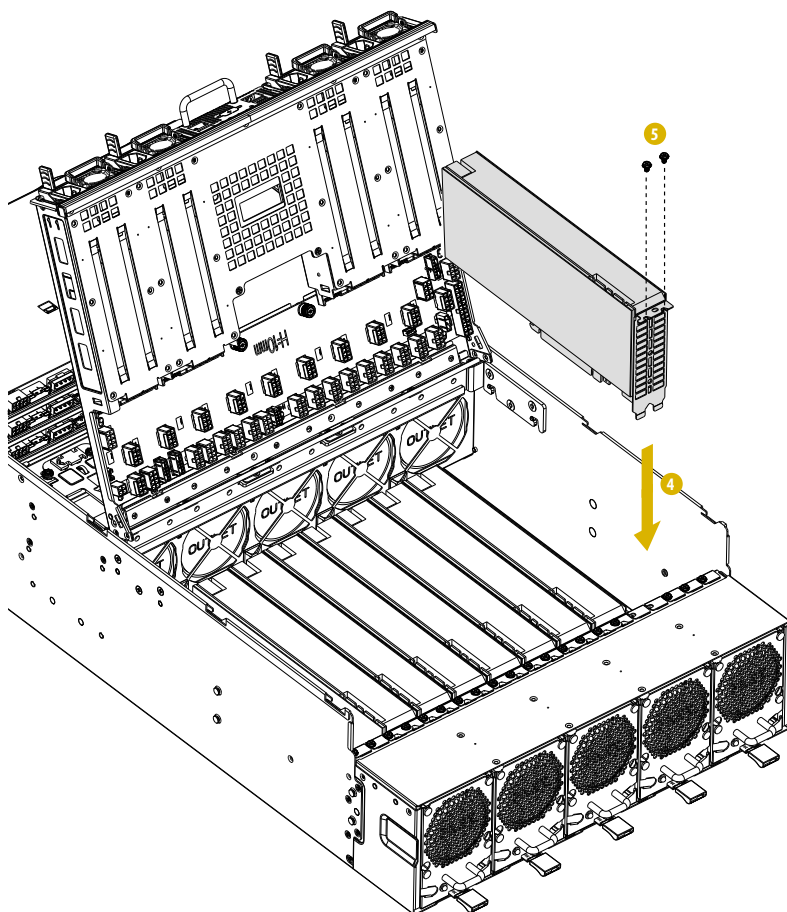
1. Hold on to the PSU tray handle and then open the tray.



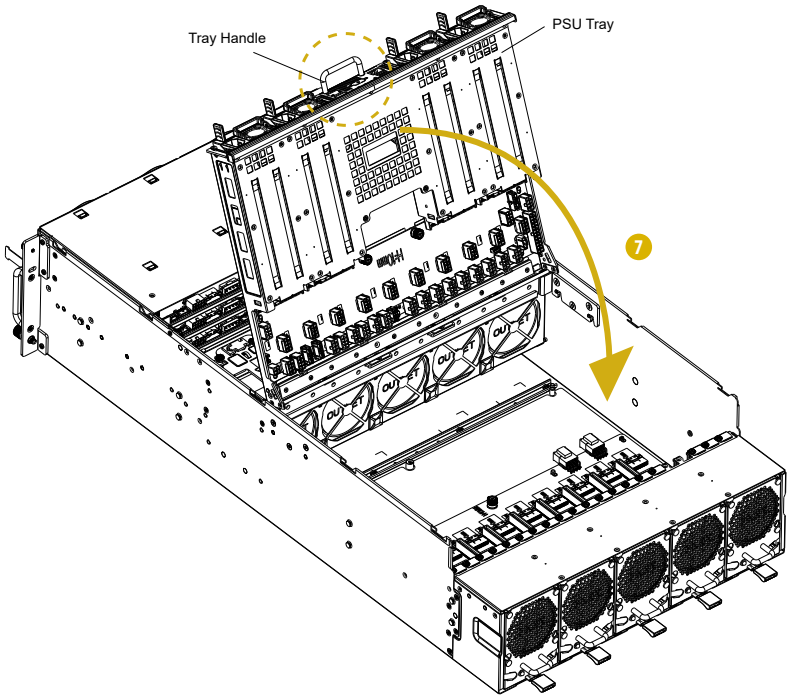
2. Remove the screws securing the covers in place for the slots you want to use. Keep this screw for later use
Note: Remove one slot cover for a single-width card; remove two slot covers for a double-width card.
3. Lift to remove the blanking plates.



4. Align the GPU card with the slot and insert it into place.
5. Secure the card to the chassis using the screws previously removed.



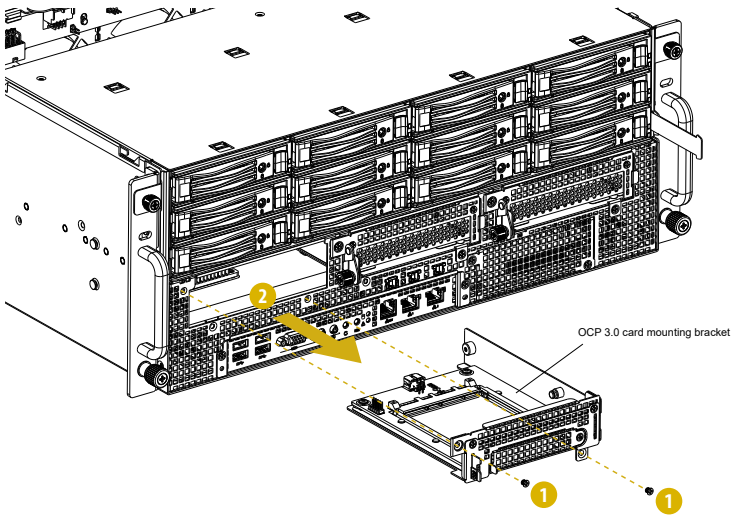
6. Close the PSU tray.



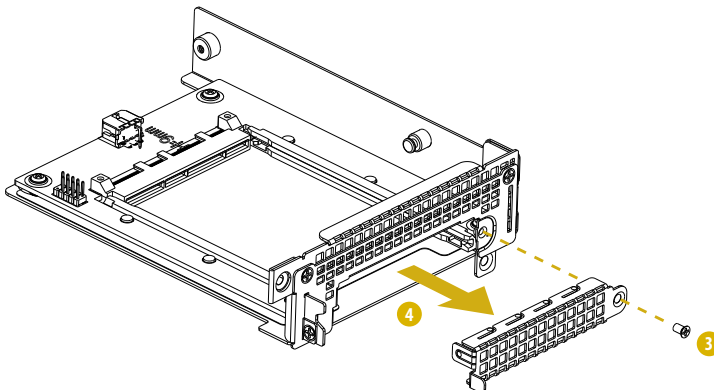
3.6 OCP 3.0 Card

Installing the OCP 3.0 Card to the Chassis

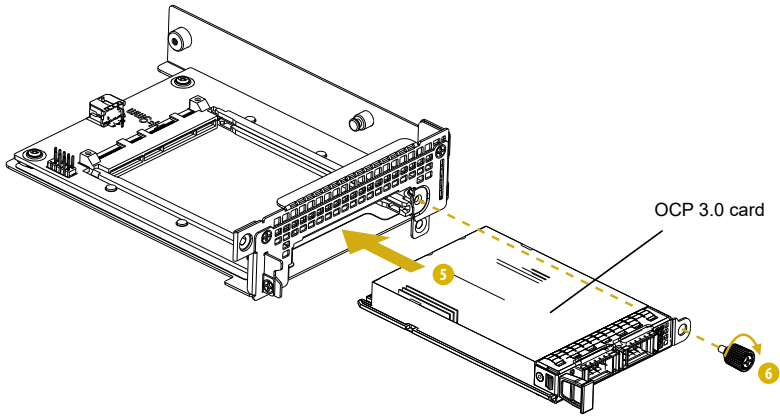
1. Release the screws that secure the OCP 3.0 card mounting bracket to the chassis. Keep the screws for later use.
2. Remove the OCP 3.0 card mounting bracket.



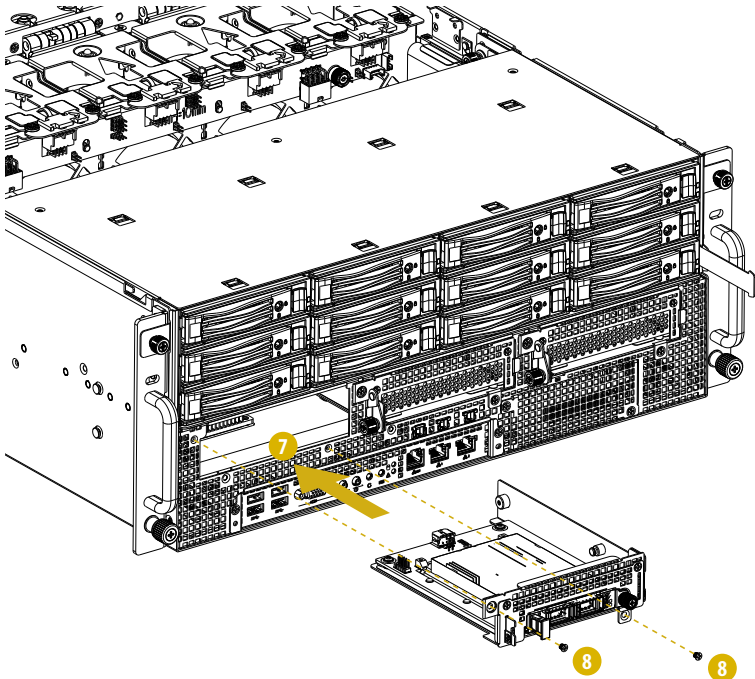
3. Remove the screw that secures the slot cover to the bracket.
4. Remove the slot cover.



5. Insert the OCP 3.0 card into the slot. Push it all the way in and make sure it is well installed.
6. Hand-tighten the thumbscrew to secure the OCP 3.0 card to the bracket.



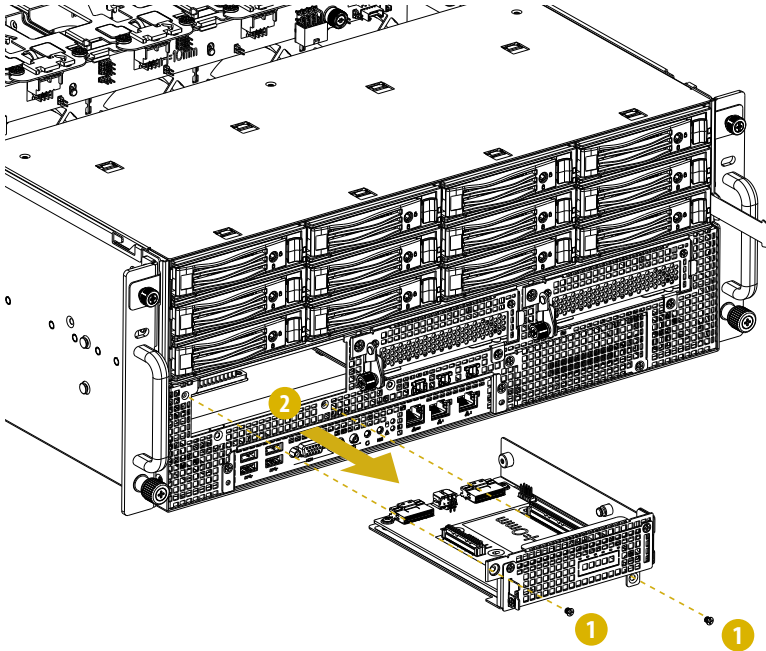
7. Insert the OCP 3.0 Card assembly into the slot. Push it all the way in and make sure it is well installed.
8. Tighten the screws to secure the OCP 3.0 card assembly to the chassis.



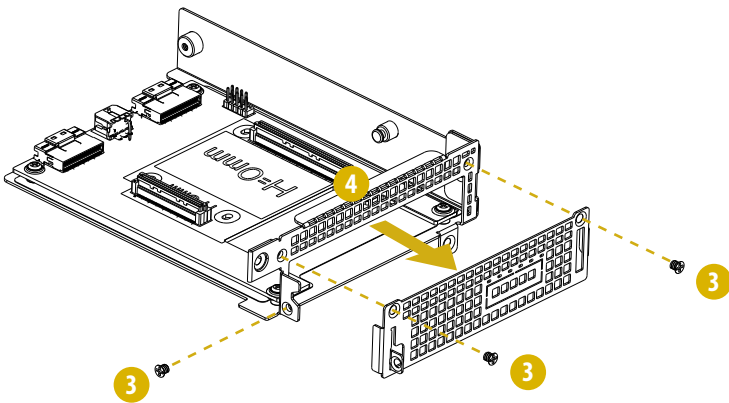
3.7 Mezzanine Card (Optional)

Installing a Mezzanine Card

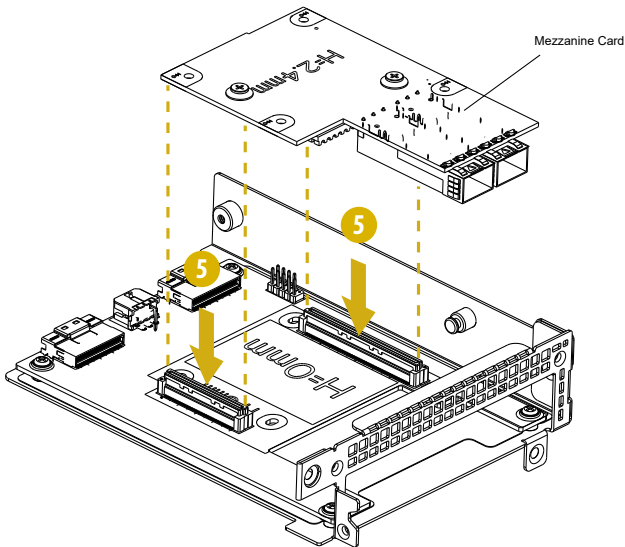
1. Release the screws that secure the mezzanine card mounting assembly to the chassis.
Keep the screws for later use.
2. Pull to remove the mezzanine card mounting assembly.



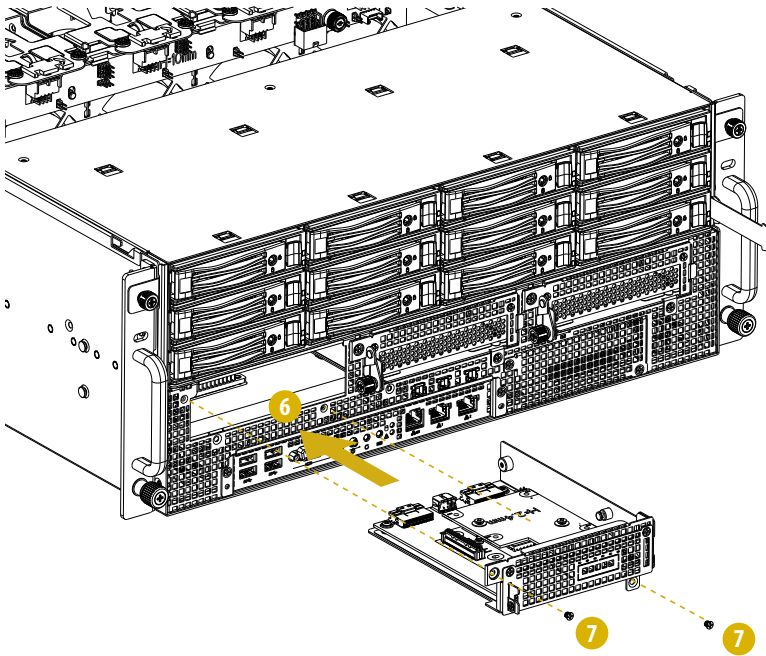
3. Release the screws that secure the slot cover to the assembly.
4. Remove the slot cover.



5. Install the mezzanine card to the mezzanine slots in the assembly. Make sure mezzanine card is securely seated in the mezzanine connectors.



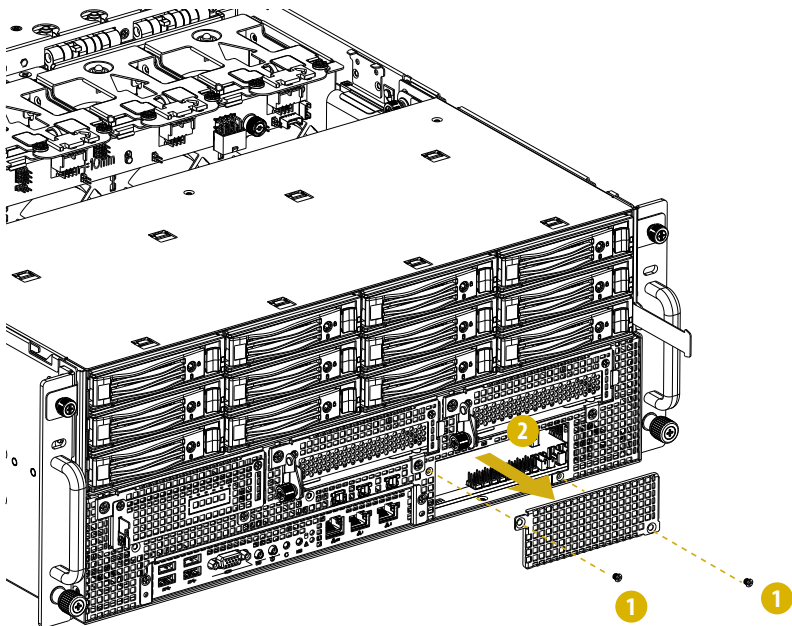
6. Insert the mezzanine card assembly into the slot.
7. Use screws to secure the mezzanine card assembly to the chassis.



3.8 LCM (4U8G-ROME2/2T-24S only)

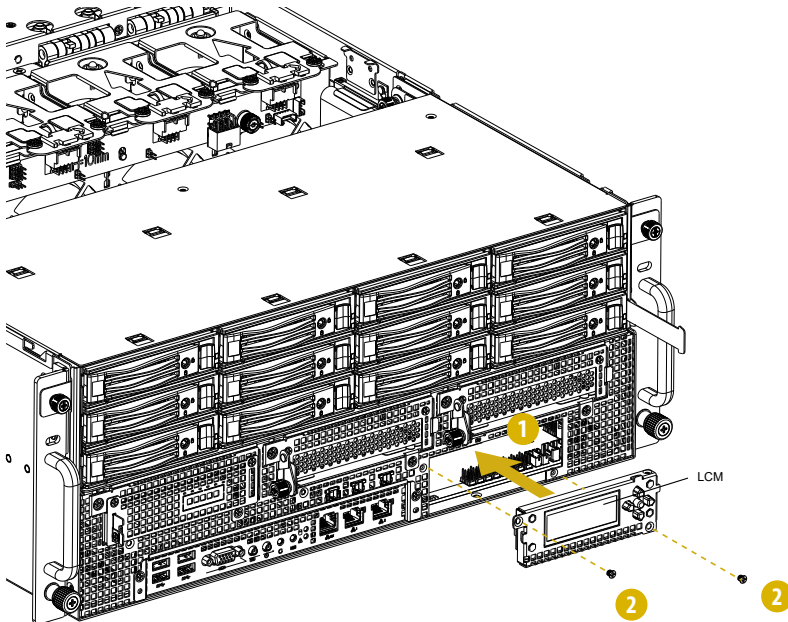
Removing the Blanking Plate

1. Loosen the screws that secure the blanking plate on the chassis. Keep the screws for later use.
2. Remove the blanking plate from the chassis.



Installing a LCM (Liquid Crystal Display Module)

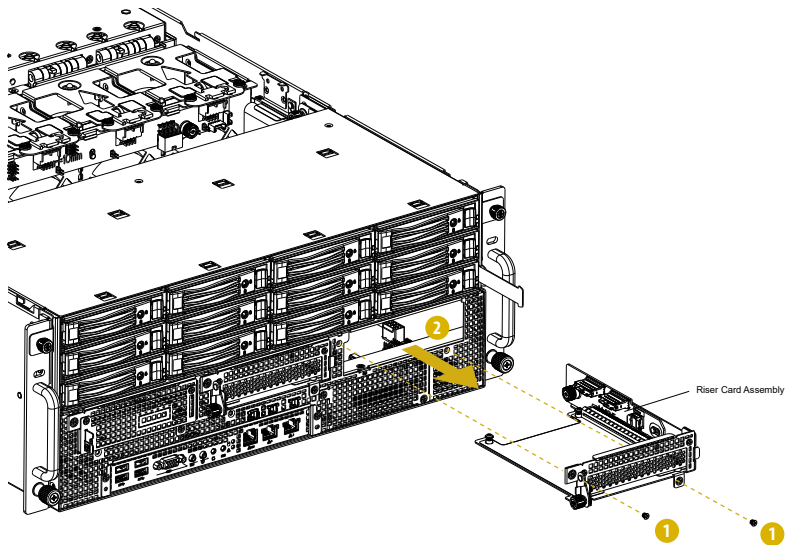
1. Install a liquid crystal display module to the front of the chassis.
2. Use screws to secure the it in place.



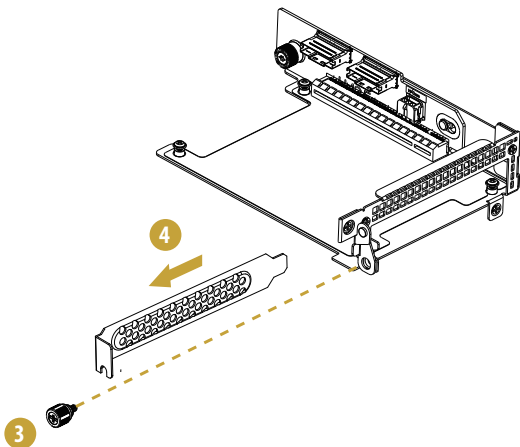
3.9 Add-on Card

Removing the PCIe Riser Card Assembly from the Chassis

1. Loosen the screws on the riser card assembly.
2. Pull to remove the riser card assembly from the chassis.

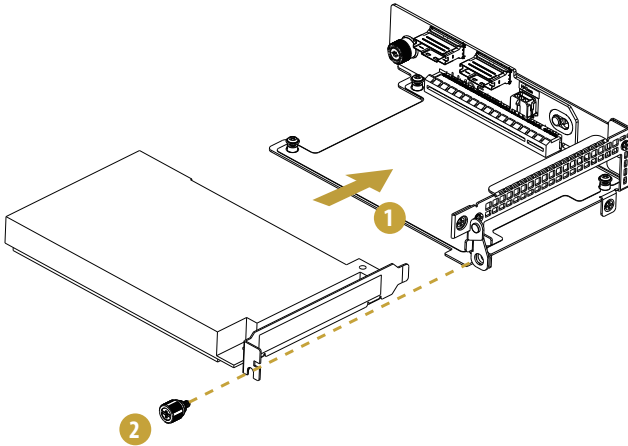


3. Remove the screw securing the blanking plate to the assembly.
4. Slide the blanking plate out sideways.

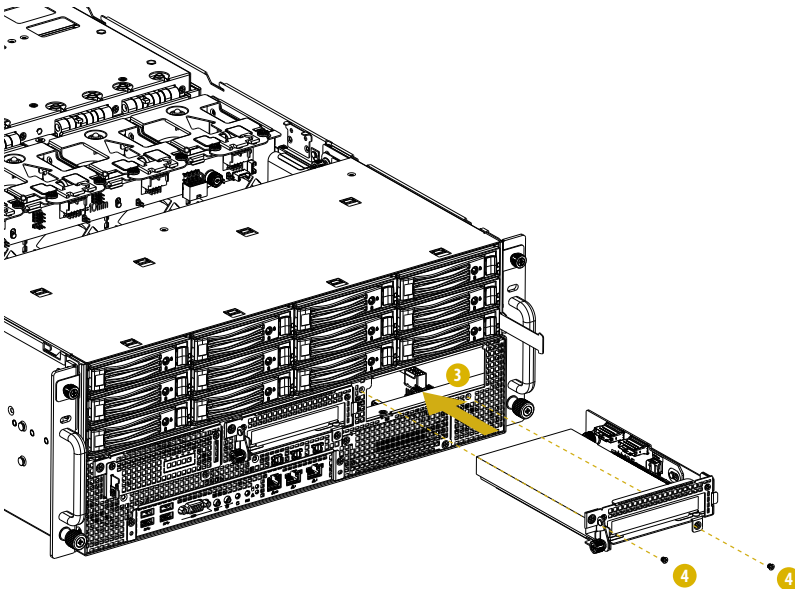


Installing the PCIe Add-on Card

1. Install a PCIe add-on card in the riser card assembly. Make sure that the PCIe card is correctly seated.
2. Tighten the screw to secure the PCIe card to the riser card assembly.



3. Insert the add-on card assembly into the slot on the front of the chassis.
4. Use screws to secure it to the chassis.

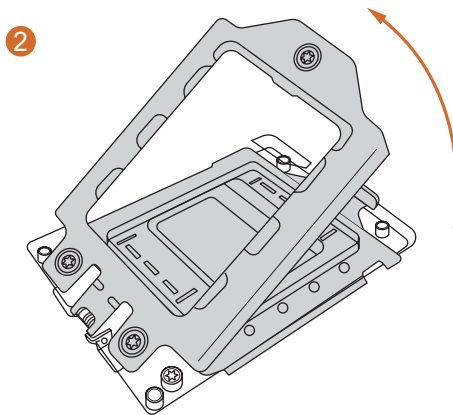
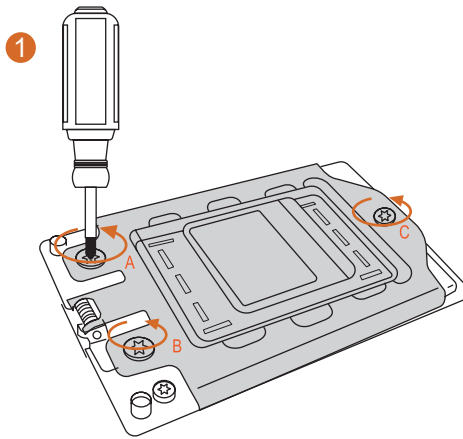


Appendix A

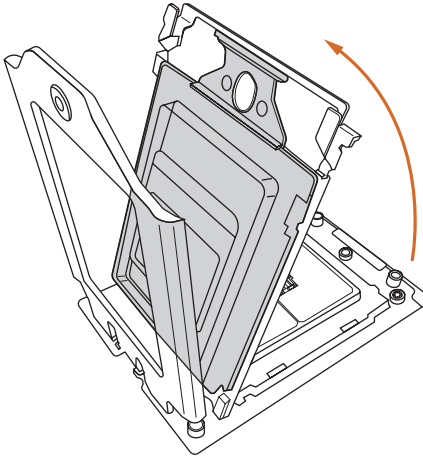
Installing the CPU



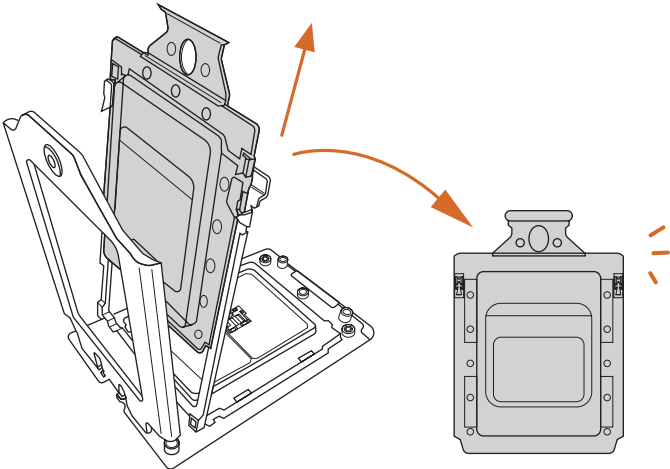
1. Before you insert the CPU into the socket, please check if the PnP cap is on the socket, if the CPU surface is unclean, or if there are any bent pins in the socket. Do not force to insert the CPU into the socket if above situation is found. Otherwise, the CPU will be seriously damaged.
2. Unplug all power cables before installing the CPU.



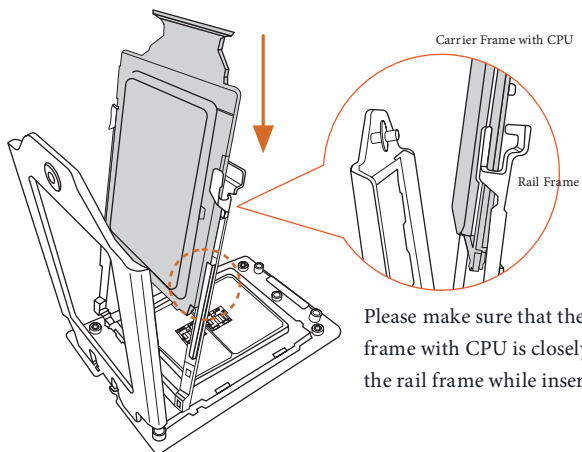
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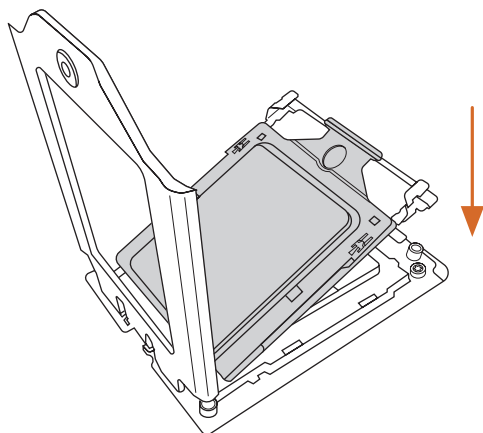


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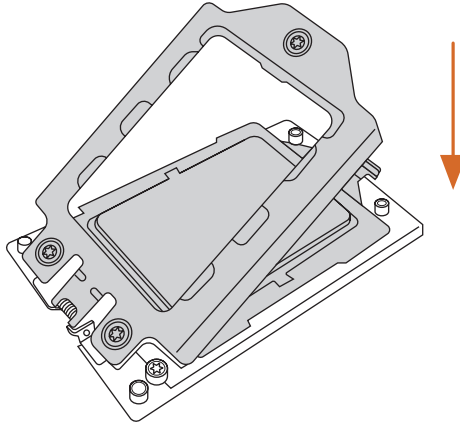


Install the carrier frame with CPU. Don't separate them.

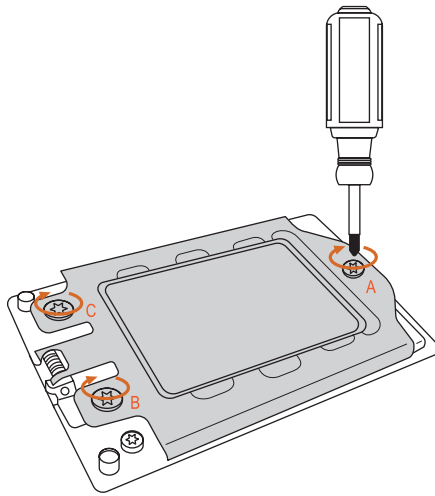
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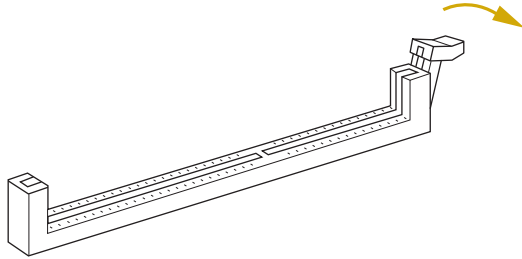


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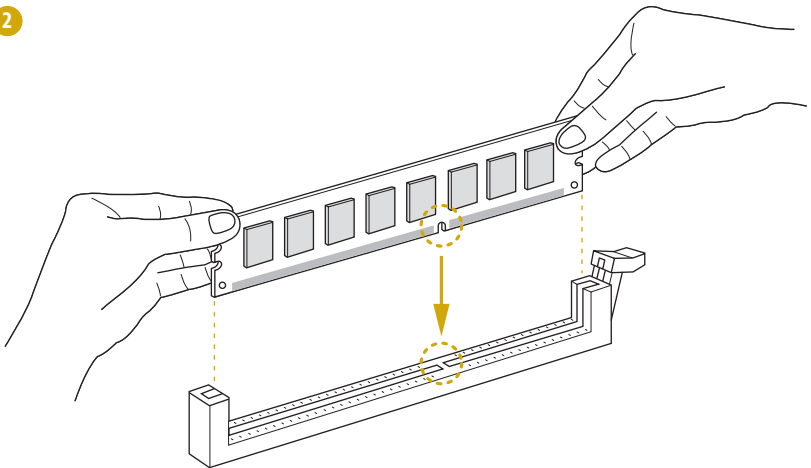


Installation of Memory Modules (DIMM)

1



2



3

