



OPEN Industry Standard, Flexible Architecture

GREEN Less Heat, Less Power Consumption

STABLE Robust Design, Quality Parts

Stable and
Reliable Solution

Server/Workstation
Motherboard

2U12L-ICX2

User Manual

English



Version 1.0

Published March 2023

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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 2U12L-ICX2, 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.

This guide provides the instructions of insertion and extraction of chassis components, such as chassis covers, system fans, power supplies, hard disk drive trays, and other main components this system supports. If the system is pre-installed a serverboard, please refer to the user’s manual of the serverboard for the information of the serverboard components, specifications and BIOS settings.



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 .

This guide includes the following system models:

System	ASRock Rack Server Board
2U12L-ICX2	SP2C621D32TM3

1.1 Shipping Box Contents

Item	Quantity
2U12L-ICX2 Barebone (2U form factor)	1
System Boards (MB)	1
Power Supply Units	2
System Fans	6
HDD Backplane (BPB)	1
Front Panel Boards	2
Rail Assembly Kit	1
Accessory Box	1
Quick Installation Guide	1



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

1.2 Specifications

2U12L-ICX2	
System Physical Status	
Form Factor	2U Rackmount
Dimension (D x W x H)	779.5 mm x 447.6 mm x 87 mm
Support MB Size	Proprietary T-shape, 18.8607" x 17.0149" (2U12L-ICX2: SP2C621D32TM3)
Front Panel	
Buttons	• Power button • UID button • System reset button
LEDs	• Power LED • Hard drive activity LED • Network activity LED • System event LED
I/O Ports	• 1 x USB 2.0 port • 1 x USB 3.2 Gen1 port • 1 x VGA port
External Drive Bay	
Front Side Drive Bay	• 12 hot-swap 3.5"/2.5" drive bays supports 8 SATA HDD/SSD and 4 NVMe (PCIe4.0 x4) SSD*
System Fan	
Fan	6 PWM hot-swap 60 x 38 mm fans
Power Supply	
Type	1+1 CRPS
Output Watts	1600W
AC Input	100-240V, 47-63Hz

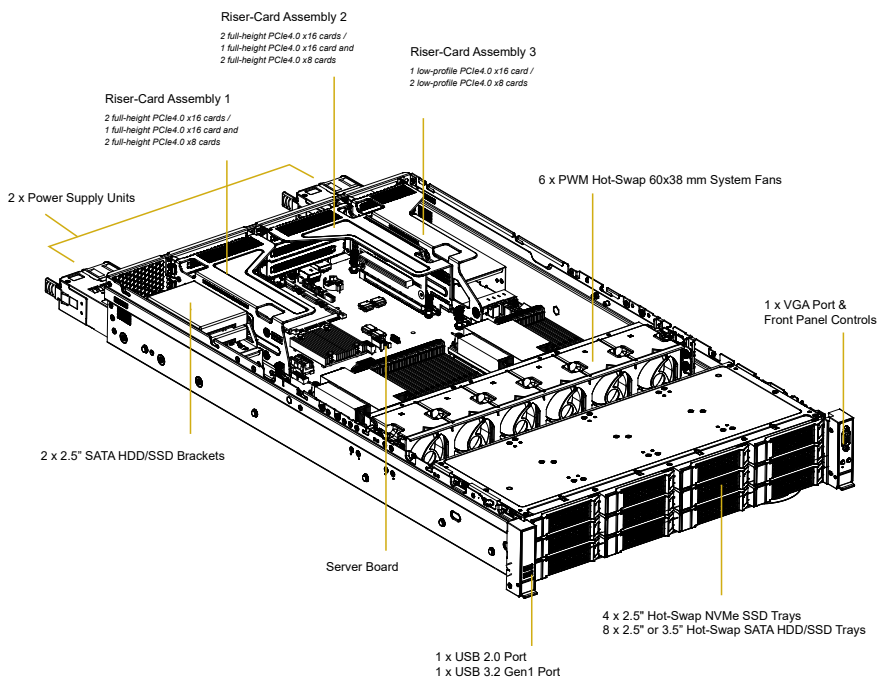


Please refer to the user manual of the motherboard you use for detailed information about motherboard components and features.

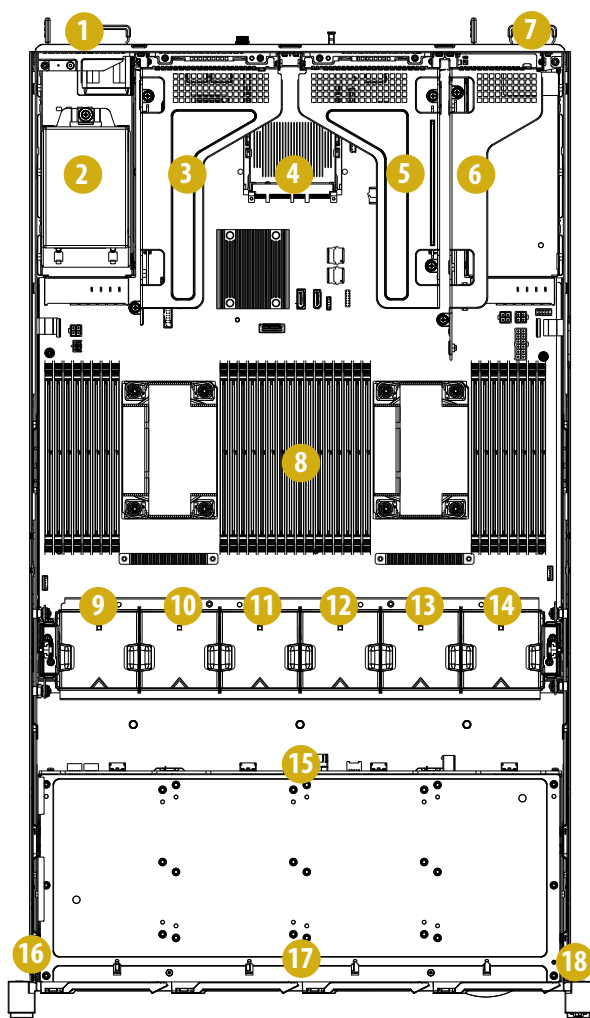
Chapter 2 Server System Overview

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

2.1 System Components

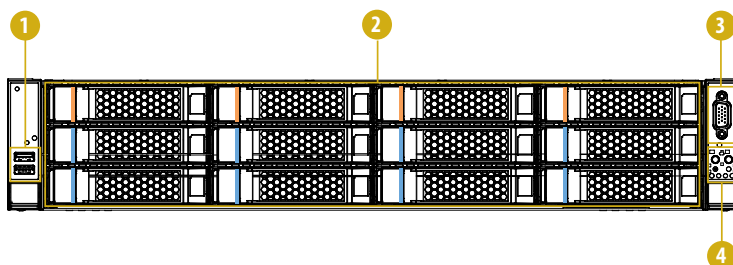


2.2 Internal Features



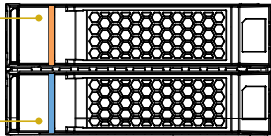
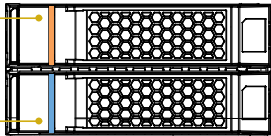
No.	From
1	1 x Power Supply Unit (PSU2)
2	2 x 2.5" SATA 3(6Gb/s) HDD/SSD
	Riser-Card Assembly 1:
3	2 full-height PCIe4.0 x16 cards 1 full-height PCIe4.0 x16 card and 2 full-height PCIe4.0 x8 cards
4	1 x OCP NIC 3.0 Card Slot <i>(supported depending on the server board model)</i>
	Riser-Card Assembly 2:
5	2 full-height PCIe4.0 x16 cards 1 full-height PCIe4.0 x16 card and 2 full-height PCIe4.0 x8 cards
	Riser-Card Assembly 3:
6	1 low-profile PCIe4.0 x16 card 2 low-profile PCIe4.0 x8 cards
7	1 x Power Supply Unit (PSU1)
8	Server Board
9	System Fan 1 (Hot-swappable)
10	System Fan 2 (Hot-swappable)
11	System Fan 3 (Hot-swappable)
12	System Fan 4 (Hot-swappable)
13	System Fan 5 (Hot-swappable)
14	System Fan 6 (Hot-swappable)
15	12-port NVMe/SATA/SAS* HDD Backplanes (BPB)* <i>*SAS drive is only supported with additional RAID/HBA cards</i>
16	Front I/O Ports (1 x USB 3.2 Gen1 Port + 1 x USB 2.0 Port)
17	4 x 2.5" NVMe SSD Trays (Hot-swappable) 8 x 2.5" or 3.5" SATA HDD/SSD Trays (Hot-swappable)
18	Front Control Panel + 1 x VGA Port

2.3 System Front Panel

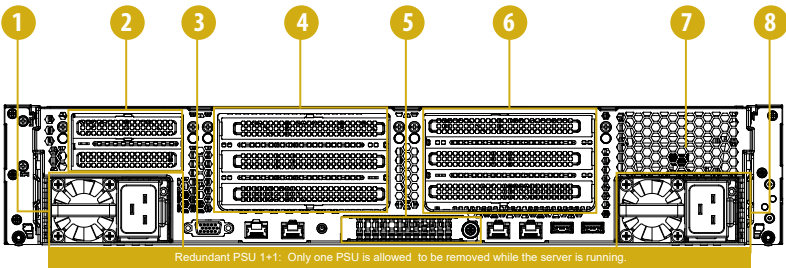


No.	Description
1	1 x USB 3.2 Gen1 Port (lower) + 1 x USB 2.0 Port (upper)
2	4 x 2.5" Hot-Swap NVMe SSD Trays 8 x 2.5" or 3.5" Hot-Swap SATA HDD/SSD Trays
3	1 x VGA Port
4	Front Control Panel

The HDD trays marked with blue color at the front side of the chassis are for 2.5" or 3.5" SATA drives only. The HDD trays marked with orange color can support 2.5" NVMe drives.

ORANGE	Supports 2.5" NVMe (PCIe4.0 x4) drives	
BLUE	Supports 2.5" or 3.5" SATA drives	

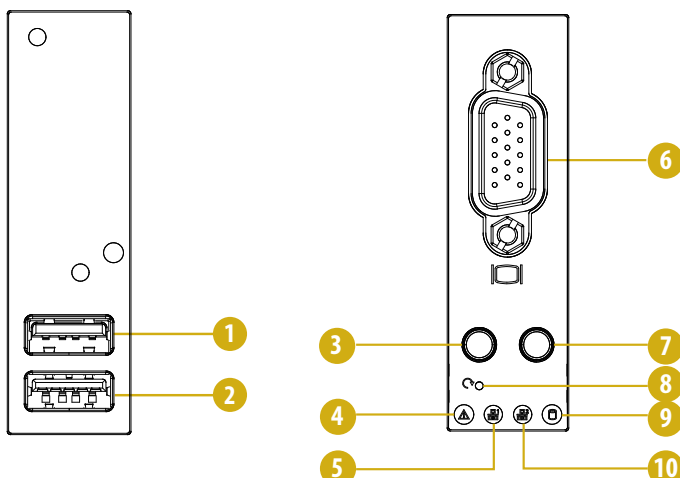
2.4 System Rear Panel



No.	Description
1	Power Supply Unit (PSU1)
2	Low-Profile Add-on PCIE Card Slots (on Riser Card Assembly 3)
3	I/O Shield (depends on the specification of the server board)
4	Full-Height Add-on PCIE Card Slots (on Riser Card Assembly 2)
5	OCP NIC 3.0 Card Slot (depends on the the server board)
6	Full-Height Add-on PCIE Card Slots (on Riser Card Assembly 1)
7	Rear Vent
8	Power Supply Unit (PSU2)

2.5 Front Control Panel Buttons and LEDs

Front Control Panel



No.	Description
1	USB 2.0 Port
2	USB 3.2 Gen1 Port
3	Power Button and LED
4	System Event LED
5	LAN1 Activity LED
6	VGA Port
7	UID Button and LED
8	System Reset Button
9	HDD Activity LED
10	LAN2 Activity LED

**Please be noted that the 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.

ID Button

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

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
Blue	Power on
Off	Power off

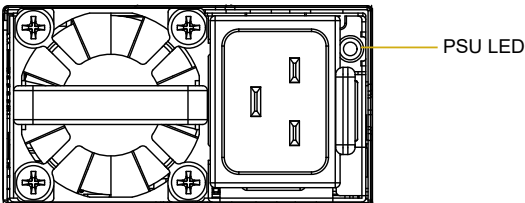
ID LED	
Status	Description
Blue	System identification is active
Off	System identification is disabled

LAN1, LAN2 LEDs	
Status	Description
Green	Link between system and network
Off	No access

HDD Activity LED	
Status	Description
Amber	HDD is active
Off	HDD idle

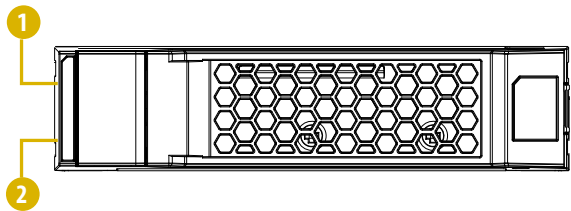
System Event LED	
Status	Description
Red	Signal error
Off	Running or normal operation

2.6 PSU LED



PSU Status LED	
Status	Description
Green	Output ON and OK
Off	NO AC power to all power supplies
Amber	- AC cord unplugged, or AC power lost; with a second power supply in parallel still with AC input power. - Power supply critical event causing a shutdown; failure, over current, short circuit, over voltage, fan failure, over temperature
1Hz Blink Amber	Power supply warning events where the power supply continues to operate; high temp, high power, high current, slow fan
1Hz Blink Green	- PSU standby state AC present/Only 12VSB on - Power supply is cold standby state or always standby state as defined in the Cold Redundancy section of the CRPS Common Requirements Specification
2Hz Blink Green	Power supply FW updating

2.7 Drive Tray LEDs & Lock



No.	Description
1	HDD Power LED
2	HDD Activity LED

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

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.

- 2.5" / 3.5" HDD(s)
- Power Supply Units (Pre-installed)
- System Fans (Pre-installed)
- Server Board (Pre-installed)
- HDD Backplane Boards (Pre-installed)
- Front Panel Boards (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.

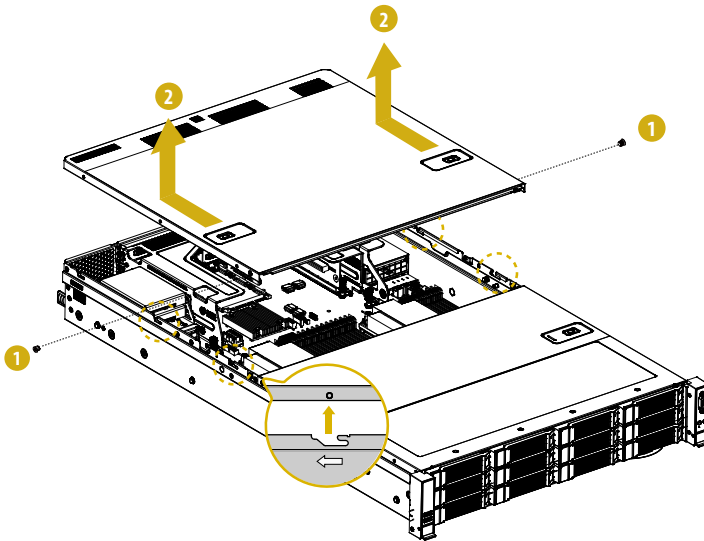
3.1 Server Top Cover

Removing the Server Top Cover

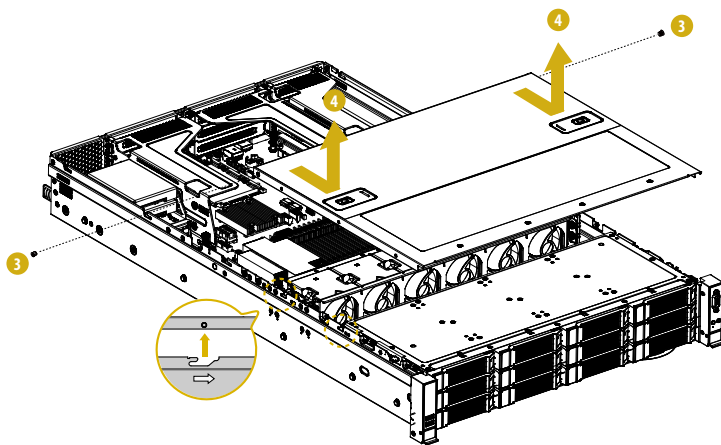


1. Before removing the top cover, power off the server and unplug the power cord.
2. The system must be operated with all the chassis top cover installed to ensure proper cooling.

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.

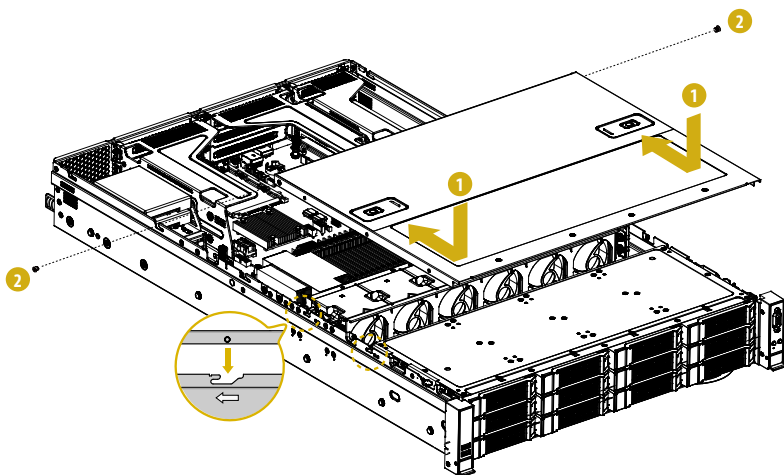


3. Remove the screws that secure the top front cover to the chassis.
4. Push the cover forward to remove it from the locked position. Then lift up and remove the cover.

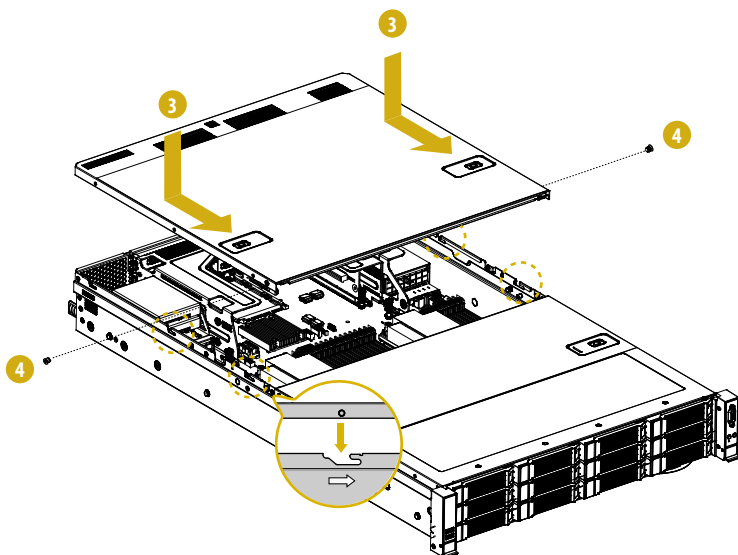


Installing the Server Top Cover

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 rear side 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 side of the chassis. Then secure the top cover with the screws.



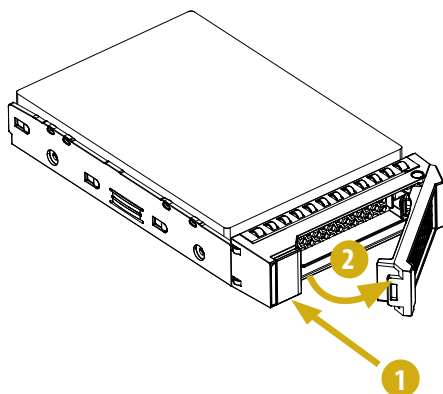
3.2 Hard Drive (Front Side)

3.2.1 Installing a Hard Disk Drive into the Hard Drive Tray

The hard disk trays on the front side of the chassis support both 2.5" or 3.5" hot-swappable hard disk drives.

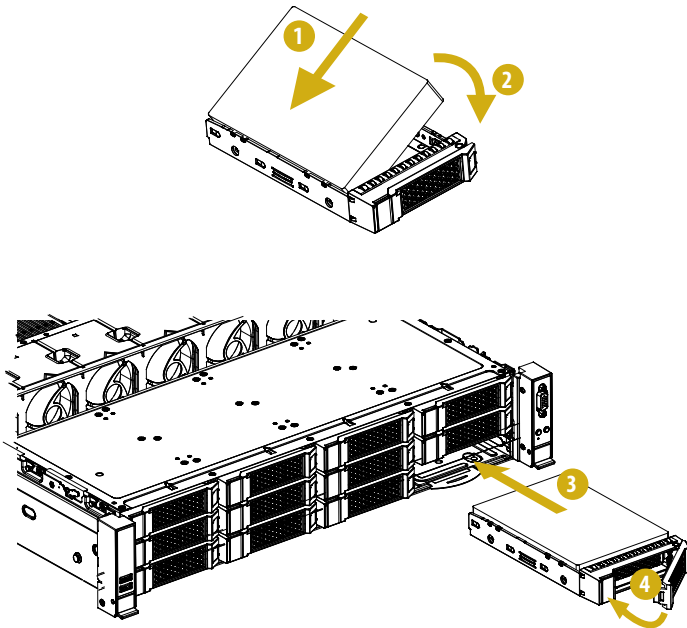
Removing the Hard Drive Trays from the Chassis

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.



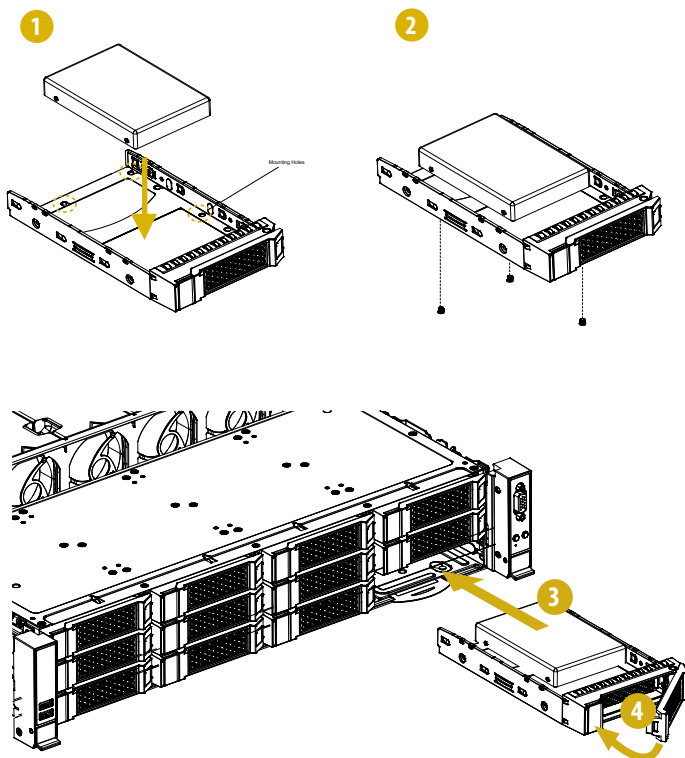
Installing a 3.5" Hard Drive to the Hard Drive Tray

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.



Installing a 2.5" Hard Drive to the Hard Drive Tray

1. Place a 2.5" HDD into the tray with the printed circuit board side facing down.
Carefully align the mounting holes in the hard drive and the tray.
2. Secure the hard drive using three screws.
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.

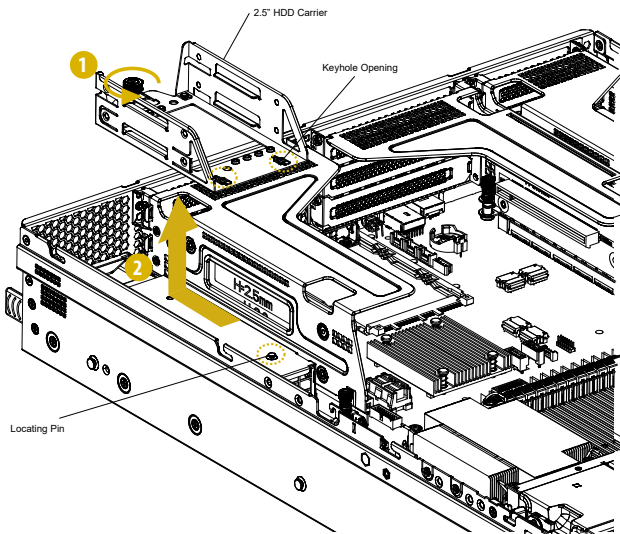


3.3 Hard Drive (Internal)

3.2.1 Installing a 2.5" Hard Disk Drive into the Hard Drive Carrier

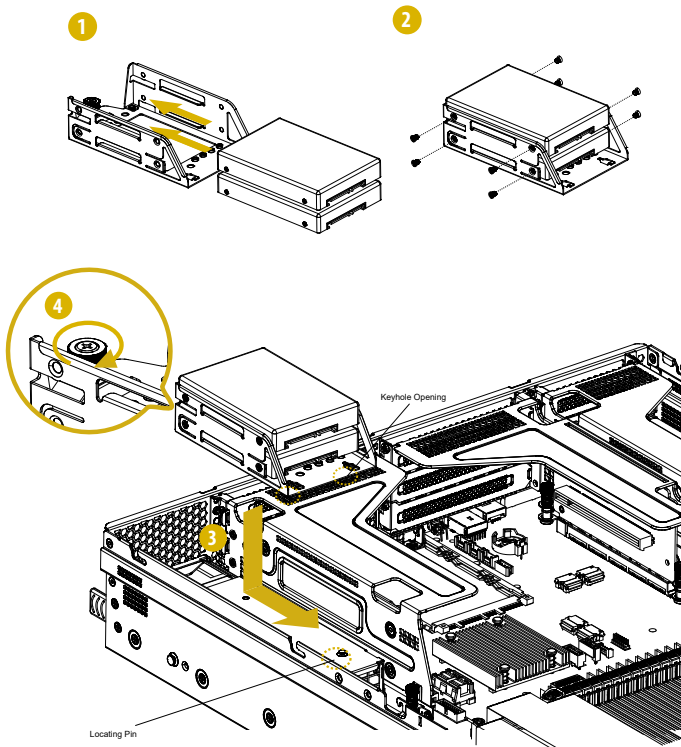
Removing a 2.5" Hard Drive Carrier from the Chassis

1. Release the thumb screw that secures the hard drive carrier to the chassis.
2. Push the carrier straight back to remove it from the locked position. Lift up and remove the carrier.
3. Push straight back to remove the cover from the locked position. Then lift up and remove the cover.



Installing a 2.5" Hard Drive to the Hard Drive Carrier

1. Slide the 2.5" hard drives into the carrier with the printed circuit board side facing down. Carefully align the mounting holes in the hard drives and the carrier.
2. Secure the hard drive using the four screws.
3. Place the hard drive carrier on the base plate in the chassis. Align the keyhole openings on the base with the locating pins on the bottom of the hard drive carrier. Pull the hard drive carrier toward the rear of the chassis until the carrier clips.
4. Tighten the thumb screw on the carrier to secure the hard drive assembly to the base plate.



3.4 Power Supply

Installing and Removing the Power Supply



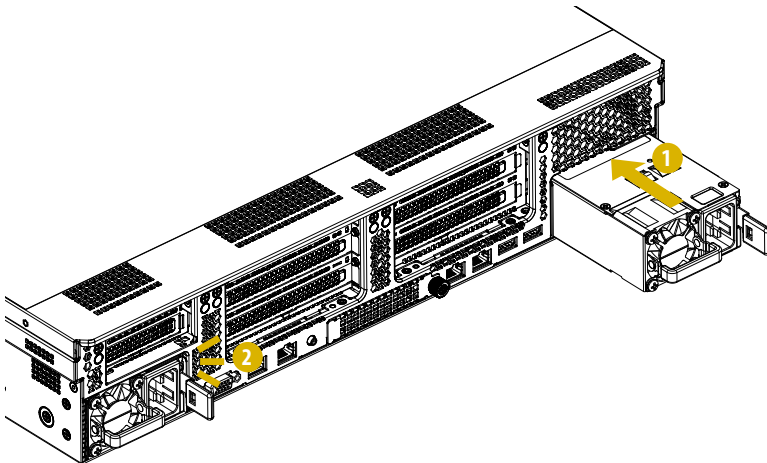
Before replacing the power supply, power off the server, unplug the power cord, and disconnect all wiring from the power supply.

Installing the Power Supply Unit

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 of power.

One power supply is required for full load operation, with the other power supply purely as a redundant, load-sharing backup. It can be removed without affecting system operation.

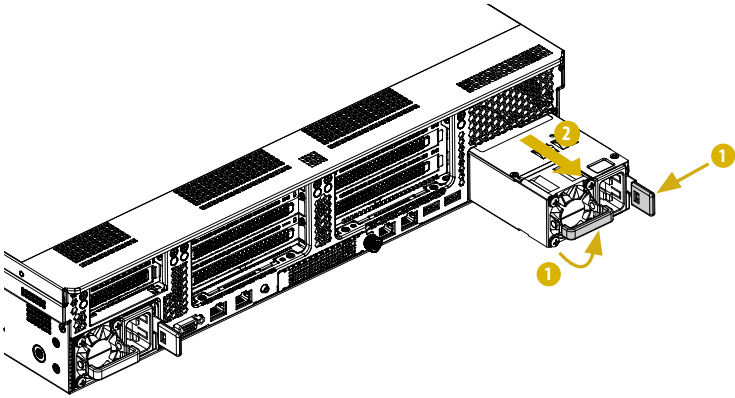
1. Align the power supply unit with the power supply slot. Ensure that the LED appears on the lower right when you are installing the power supply unit.
2. Carefully slide the PSU all the way into the power supply bay until it clicks into place.



Removing the Power Supply Unit

To remove a failed power supply, identify the failed power supply by checking the power supply LED 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.



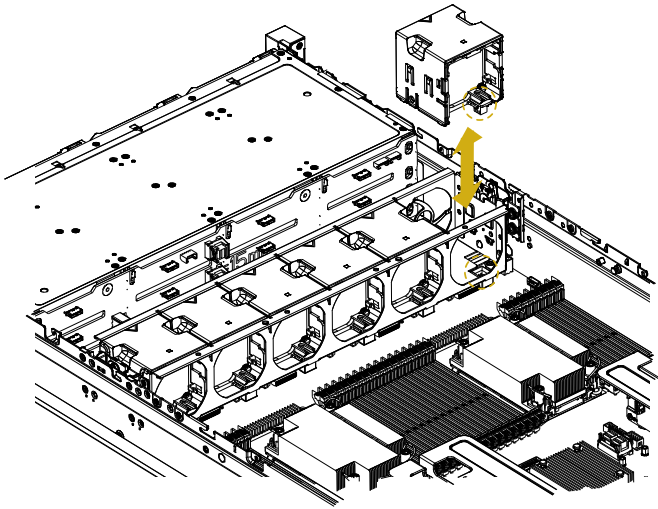
1. Before replacing the power supply, power off the server, unplug the power cord, and disconnect all wiring from the power supply.
2. In a redundant system, you do not need to power down the server.

3.5 System Fan

The system supports hot-swappable system fans.

Replacing the System Fan

1. Lift to remove the failed fan.
2. Align the fan connector on the bottom of the replacement fan with the fan connector in the fan cage.
3. Gently place the fan into the fan cage.
4. Make sure the fan is well seated.



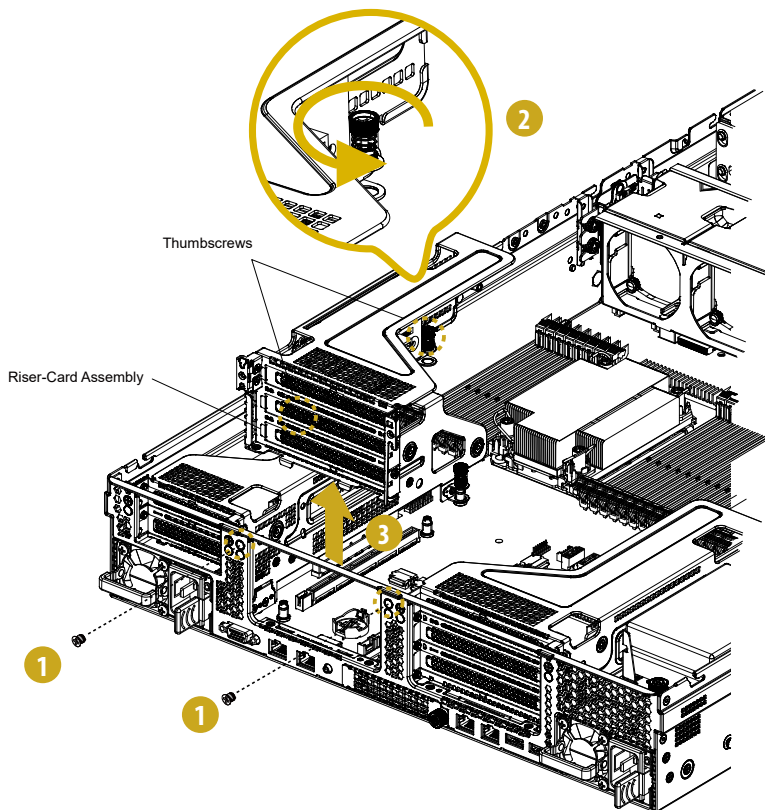
3.6 Add-on Card



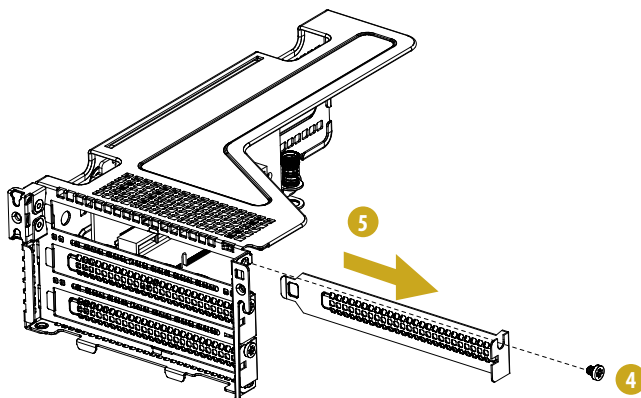
1. You can install an add-on card to the chassis with the riser card assembly installed on the serverboard.
2. Before installing the add-on card, power off the server and unplug the power cord.

Installing an Add-on Card

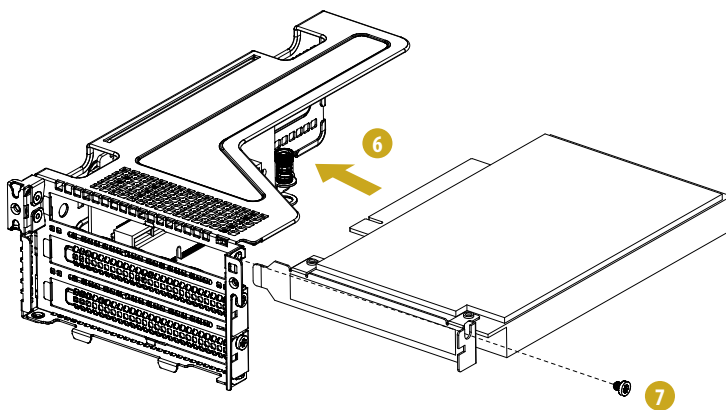
1. Remove the screws that secure the riser-card assembly to the chassis.
2. Release the two thumbscrews on interior side of the riser-card assembly.
3. Push upward to remove the riser-card assembly from the chassis.



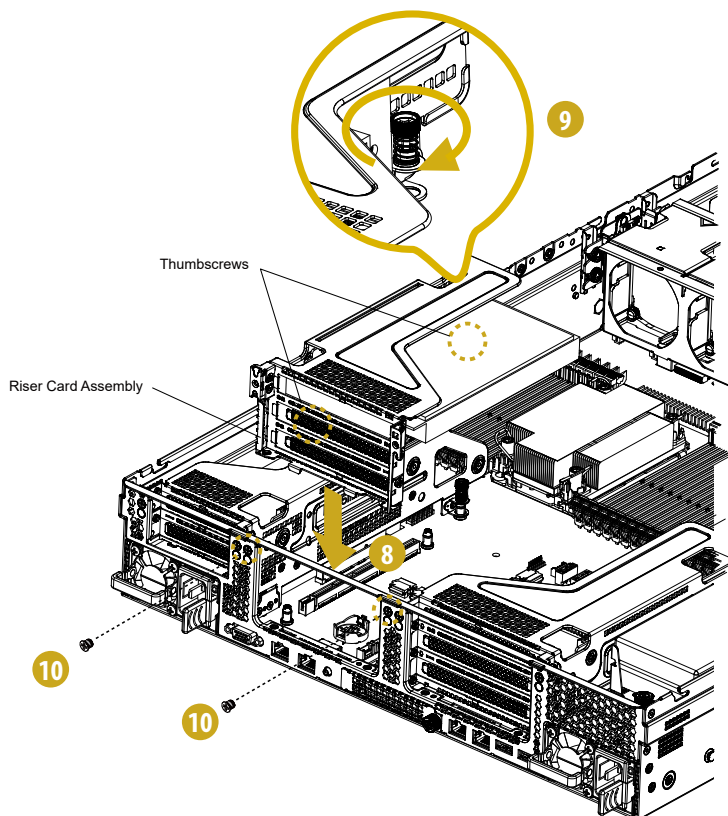
4. Remove the screw securing the slot cover to the assembly.
5. Slide the slot cover out sideways.



6. Install an add-on card into the riser-card assembly.
7. Tighten the screw to secure the add-on card.



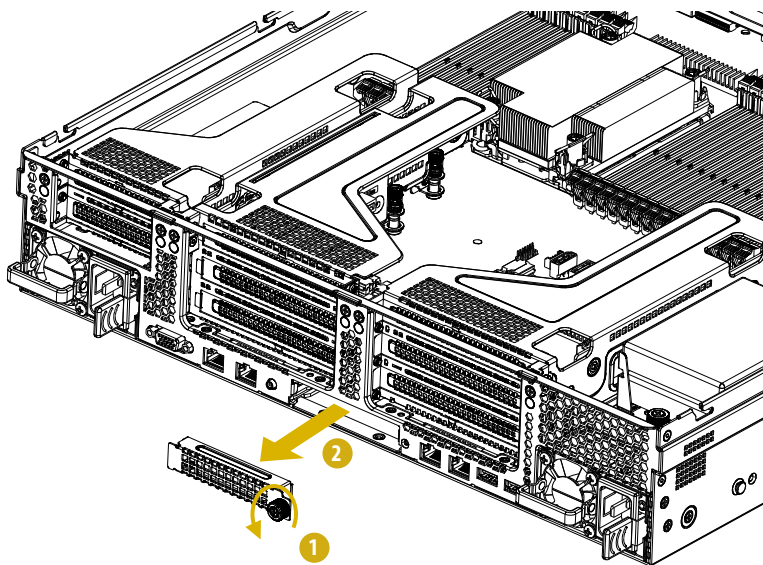
8. Install the add-on card assembly to the chassis. Align the plate of the add-on card with the openings in the back of the chassis.
9. Hand-tighten the thumbscrews on the riser card assembly.
10. Use screws to secure the add-on card assembly to the chassis.



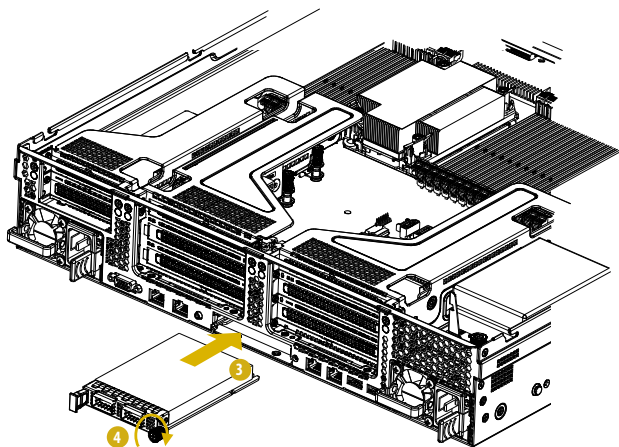
3.7 OCP Card

Installing and Removing the OCP Card

1. Hand-release the thumb screw that secures the slot cover to the chassis.
2. Remove the slot cover.



3. Install an OCP card into the slot.
4. Make sure that the card is well seated and hand-tighten the thumb screw on the face plate.



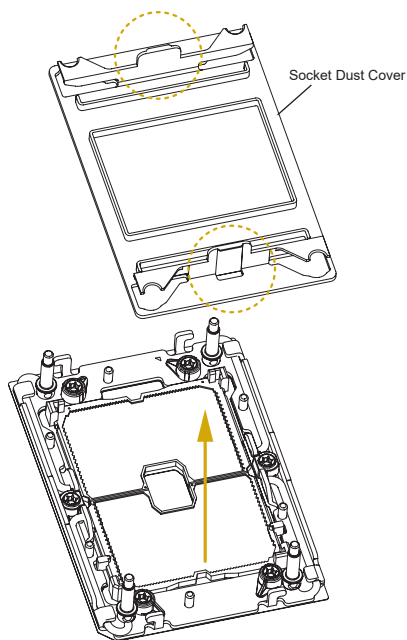
Appendix A

Installing the CPU and Heatsink



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.

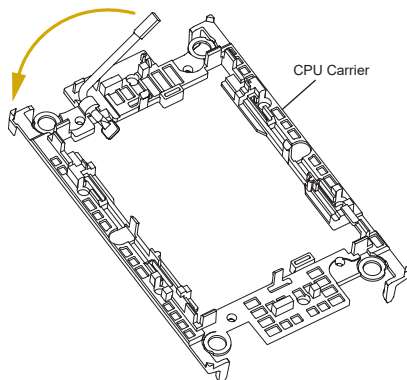
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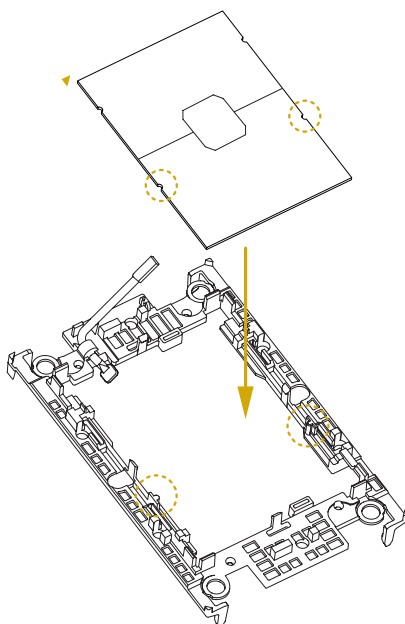


1. Before you installed the heatsink, you need to spray thermal interface material between the CPU and the heatsink to improve heat dissipation.
2. Illustration in this documentation are examples only. Heatsink or fan cooler type may differ.

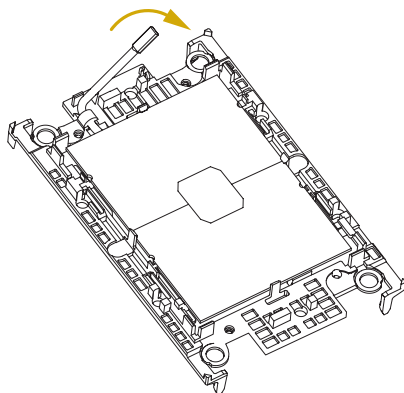
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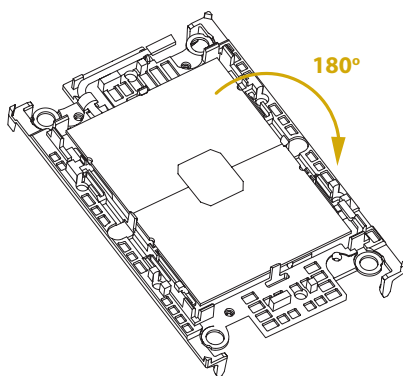
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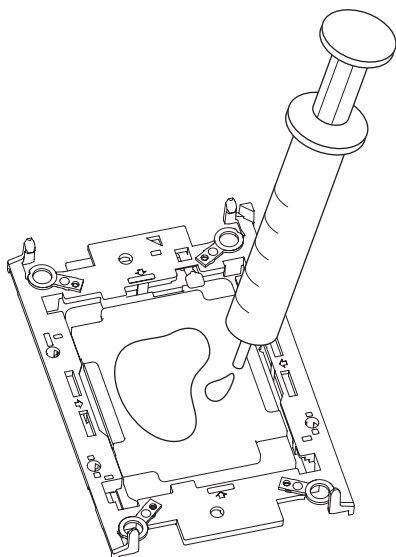
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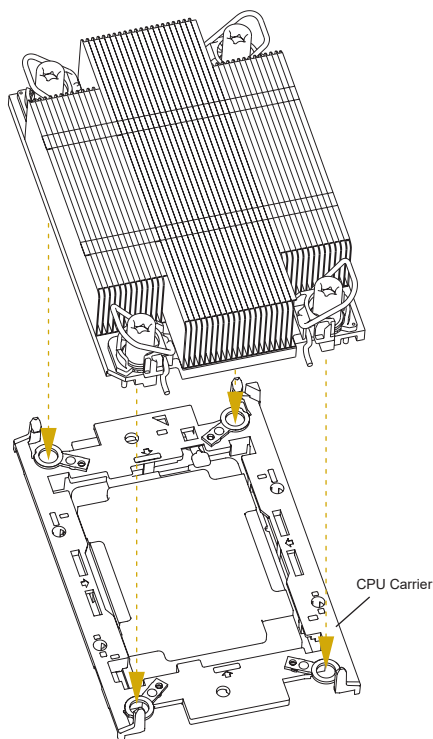
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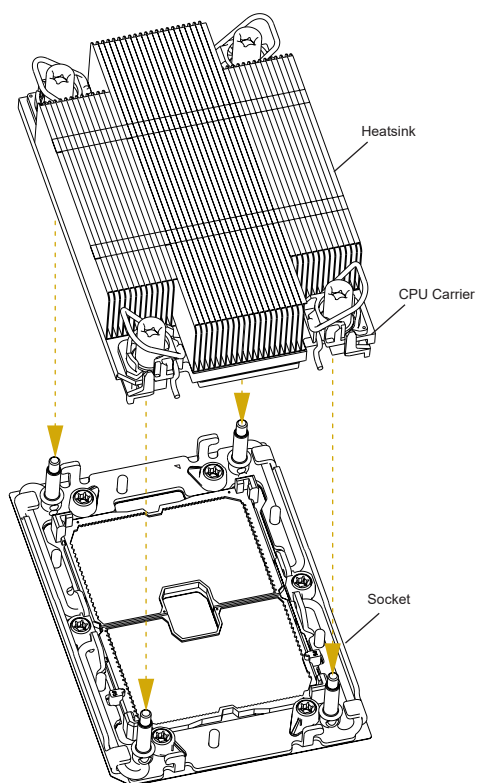
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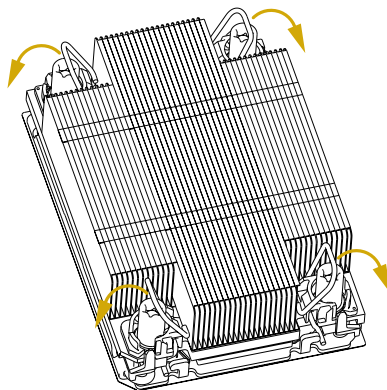
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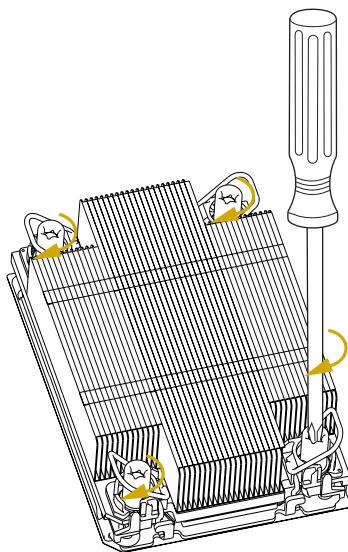
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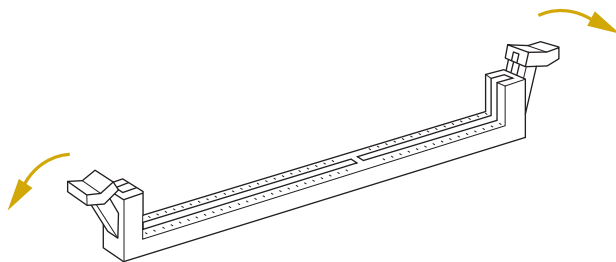
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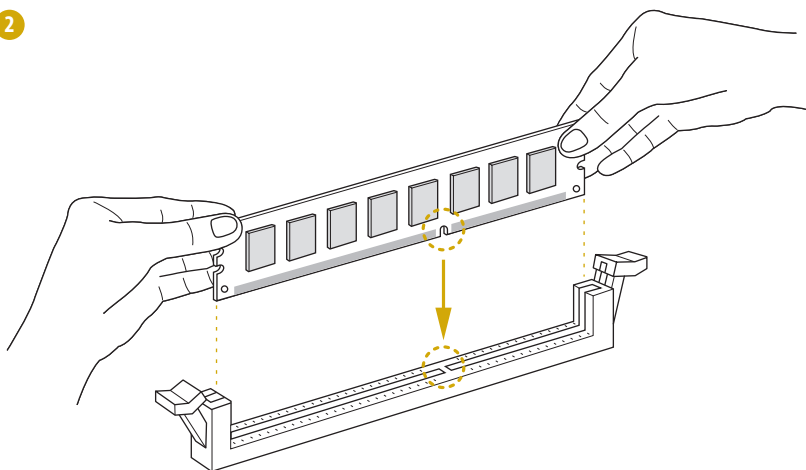
Appendix B

Installation of Memory Modules (DIMM)

1



2



3

