ASRock Rack

OPEN
Industry Standard, Flexible Architecture

GREEN
Less Heat, Less Power Consumption

STABLE
Robust Design, Quality Parts

Stable and
Reliable Solution

Barebone

3U8G+ Series

User Manual

English

Version 1.0
Published May 2018
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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 3U8G+ 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
3U8G+ Series Barebone (3U form factor)	1
System Boards (MB)*	1
Power Supply Units*	3
System Fans*	8
HDD Backplane (BPB)*	1
Front Panel Board*	1
Power Distribution Boards (PDB)*	1
Switch Board (SWB)*	1
Power Cable, ATX 24Pin, PDB to MB, 520mm*	1
Power Cable, ATX 8Pin-1, PDB to MB, 470mm*	1
Power Cable, ATX 8Pin-2, PDB to MB, 500mm*	1
PMBus Cable, PDB to MB(1*5Pin), 470mm*	1
3U Front Control Cable (1 to 4 connectors)*	1
3U USB Cable 9Pin, 850mm*	1
MiniSAS Cable, 380mm (SATA0-3)*	1
SATA Cable, 310mm (SATA4 / SATA5)*	2
BPB Power Cable, PDB to HDD BPB*	2
3U MNG Cable, Pitch 2.0 1*5P, 610mm*	1
GPGPU Power Cable*	8
VGA Cable	1
Accessory Box	1
Support CD	1
User Manual	1
Quick Installation Guide	1
4U Top Cover (Optional)**	1
3U8G_RB(Optional)	1
3U8G_MCB(Optional)	1

** The components are pre-installed.*

*** Please purchase seperately if needed. You may need this optional accessory when the power connectors of your GPGPU card are on the top side of it.*

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

English

1.2 Specifications

3U8G+ Series	
System Physical Status	
Form Factor	3U Rackmount
Dimension (D x W x H)	27.6" x 16.9" x 5.1" (711 x 430 x 130.35 mm)
Support MB Size	CEB
Front Panel	
Buttons	• Power On/Standby button • ID button* • System reset button • NMI button*
LEDs	• Power LED • Identification LED* • Hard drive activity LED* • 4 x Network activity LEDs* • System event LED*
I/O Ports	2 x USB 2.0 ports
	1 x VGA port
Drive Bay	
External	8 x 2.5" SATA HDDs (6Gb/s)*
System Cooling	
Fan	8 x 80*38 mm system fans
Power Supply	
Capacity	3 (2+1), Redundant
Output Watts	1200W @ 200Vac~264Vac
System Switch Board	
Switch IC	PLX 8747 x 4
GPGPU Card	
GPGPU Watts	Max 300w /per card
Support GPGPU	8 x GPGPU cards

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

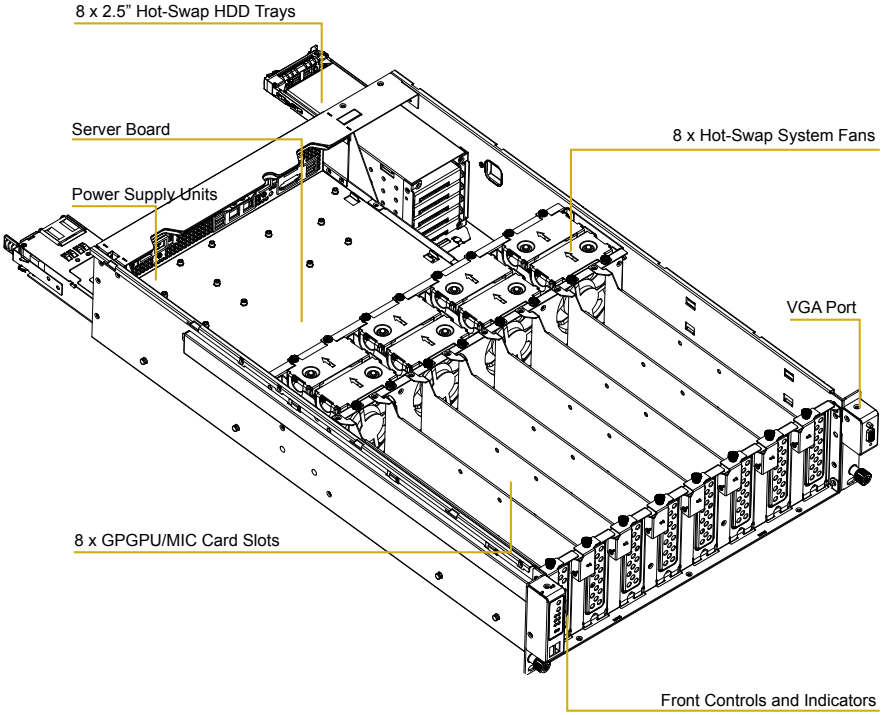
Please refer to the user manual of the motherboard you use for detailed information about motherboard components and features.

English

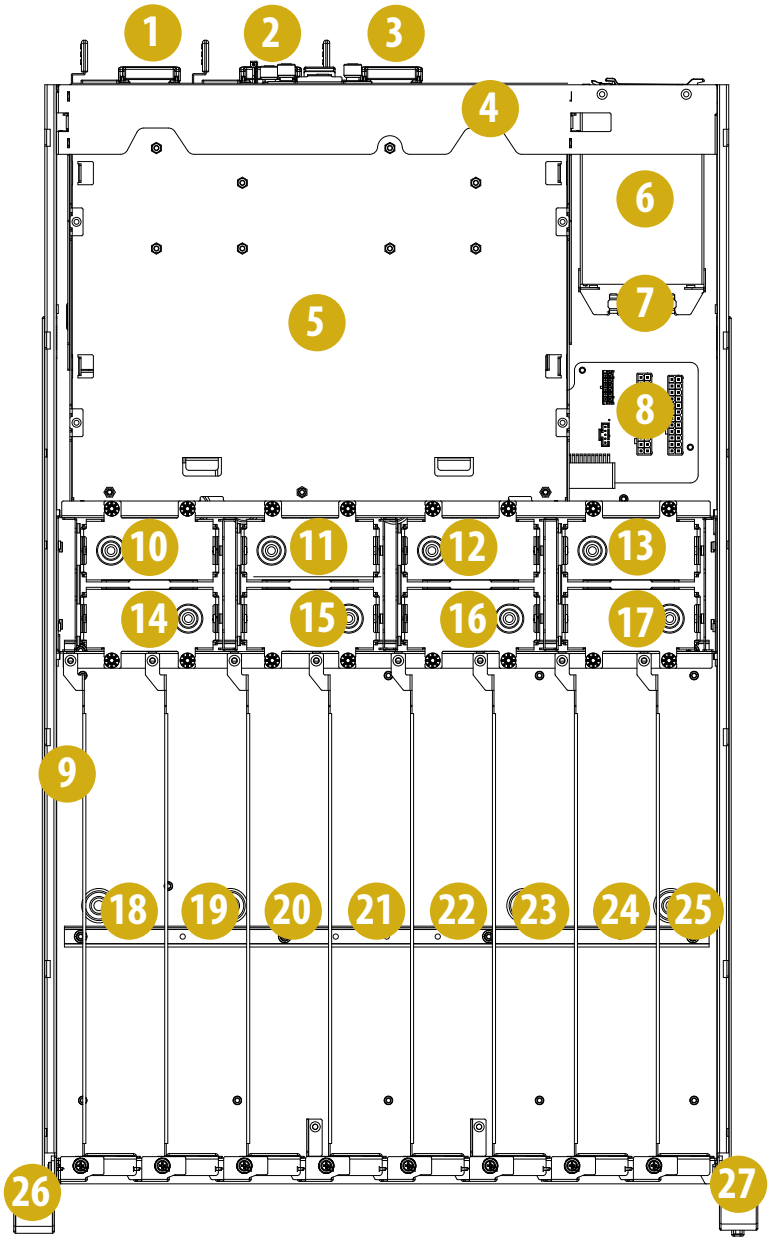
Chapter 2 Server System Overview

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

2.1 System Components

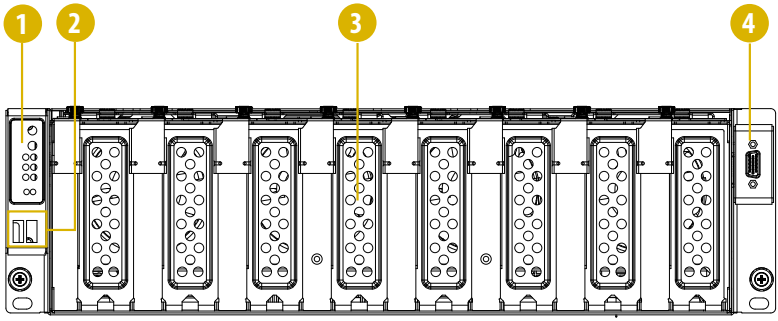


2.2 Internal Features



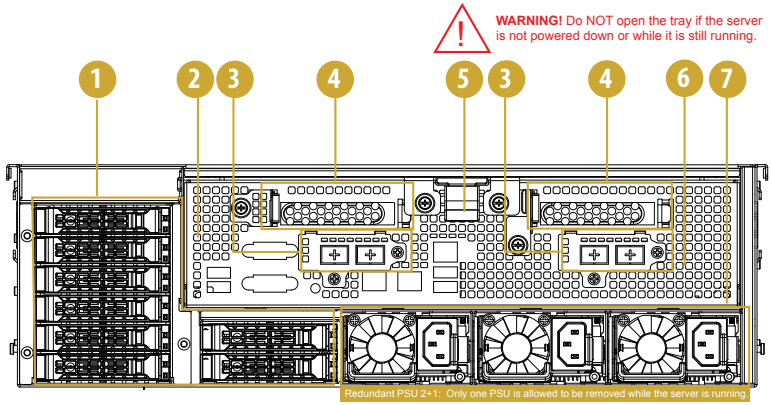
No.	From
1	Power Supply Unit (PSU) 4
2	Power Supply Unit (PSU) 3
3	Power Supply Unit (PSU) 2
4	2 x 2.5" SATA HDDs (Hot-swapable)
5	Serverboard
6	6 x 2.5" SATA HDDs (Hot-swapable)
7	HDD Backplane Board (BPB)
8	Power Distribution Board (PDB)
9	Switch Board (SWB)
10	System Fan 2
11	System Fan 4
12	System Fan 6
13	System Fan 8
14	System Fan 1
15	System Fan 3
16	System Fan 5
17	System Fan 7
18	GPGPU/MIC Card Slot 1
19	GPGPU/MIC Card Slot 2
20	GPGPU/MIC Card Slot 3
21	GPGPU/MIC Card Slot 4
22	GPGPU/MIC Card Slot 5
23	GPGPU/MIC Card Slot 6
24	GPGPU/MIC Card Slot 7
25	GPGPU/MIC Card Slot 8
26	Front Controls and USB Ports
27	VGA Port

2.3 System Front Panel



No.	Description
1	Control Panel Buttons and LEDs
2	2 x USB 2.0 Ports
3	8 x GPGPU/MIC Card Slots
4	1 x VGA Port

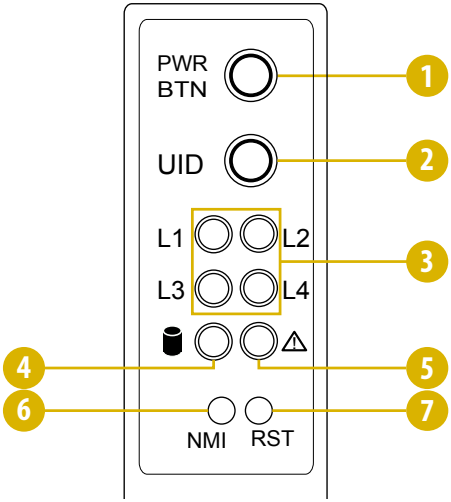
2.4 System Rear Panel



No.	Description
1	8 x 2.5" HDD trays
2	I/O Shield (depends on the specification of the server board)
3	Mezzanine Card Support for 1GbE x 2 or 10GbE x2 **Only supported for 3U8G-C612.*
4	Low Profile PCI Express Slot (for the riser card) **Only supported for 3U8G-C612/V.*
5	Motherboard Tray Handle* **WARNING! Please do NOT open the tray if the server is not powered down or while it is still running.*
6	Rear Vent
7	3 x Power Supply Units (Redundant PSU 2+1) **Server requires 2 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.*

2.5 Front Control Panel Buttons and LEDs

Front Control Panel



No.	Description
1	Power Button and LED
2	UID Button and LED*
3	LAN1, LAN2, LAN3, LAN4 Activity LEDs*
4	HDD Activity LED
5	System Event LED*
6	NMI (Nonmaskable Interrupt) Button*
7	System Reset Button

**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.

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

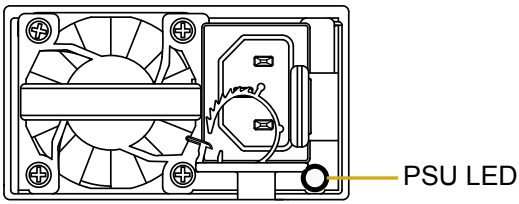
ID LED	
Status	**Description**
Blue	System identification is active.
Off	System identification is disabled.

LAN1, LAN2, LAN3, LAN4 LEDs	
Status	**Description**
Green	Link between system and network or no access
Blinking Green	Network access

HDD Activity LED	
Status	**Description**
Blinking Green	HDD access
Off	HDD idle

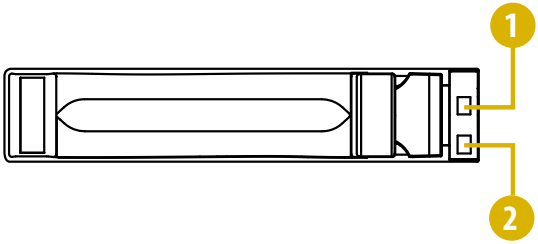
System Event LED	
Status	**Description**
Off	Running or normal operation
Red	At least one sensor has critical alert

2.6 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

2.7 Drive Tray LEDs



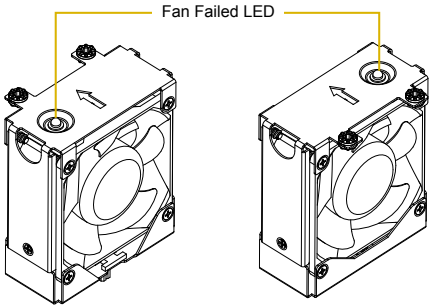
No.	Description
1	HDD Power LED
2	HDD Activity LED

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

2.8 Fan Failed LED



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.

- 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)

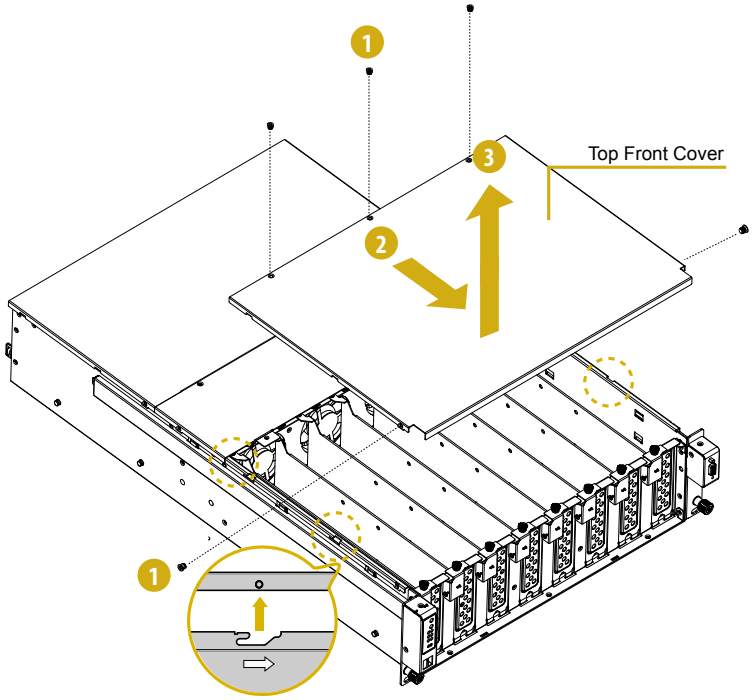
> ⚠ 1. *Some components are already pre-installed. Simply properly connect the relavant cables before or after installation. See the Quick Installation Guide for more details.*
> 2. *Refer to the user manual of the server board you use for instructions on how to install server board components.*

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.*

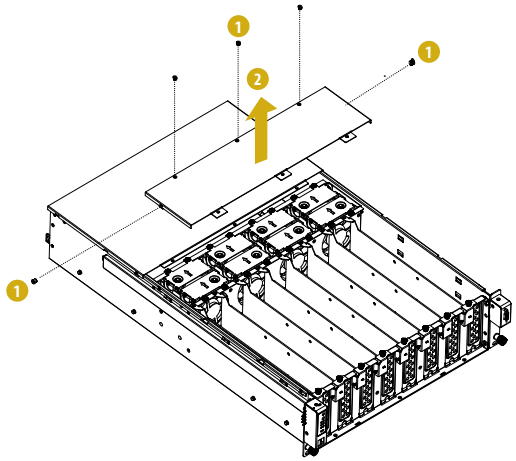
(A) Top Front Cover



1. Remove the screws that secure the top front cover to the chassis.
2. Lift up and remove the top front cover.

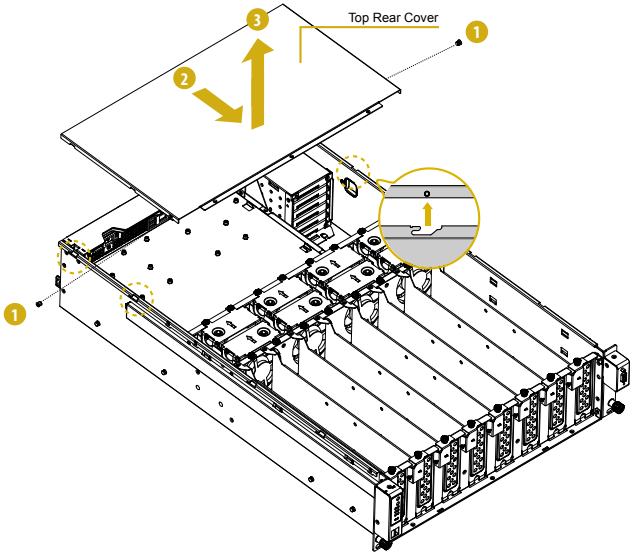
(B) Top Middle Cover

1. Remove the screws that secure the top middle cover to the chassis.
2. Lift up and remove the top middle cover.



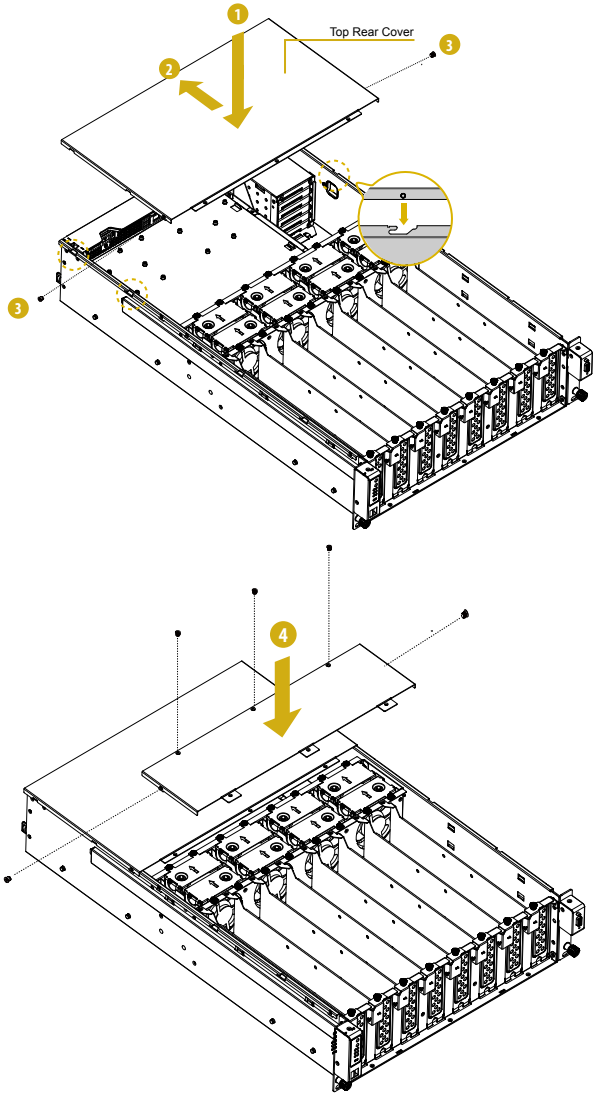
(C) Top Rear Cover

1. Remove the screws that secure the top rear cover to the chassis.
2. Push the top rear cover toward the FRONT of the chassis to remove the cover from the locked position.
3. Lift up and remove the top rear cover.

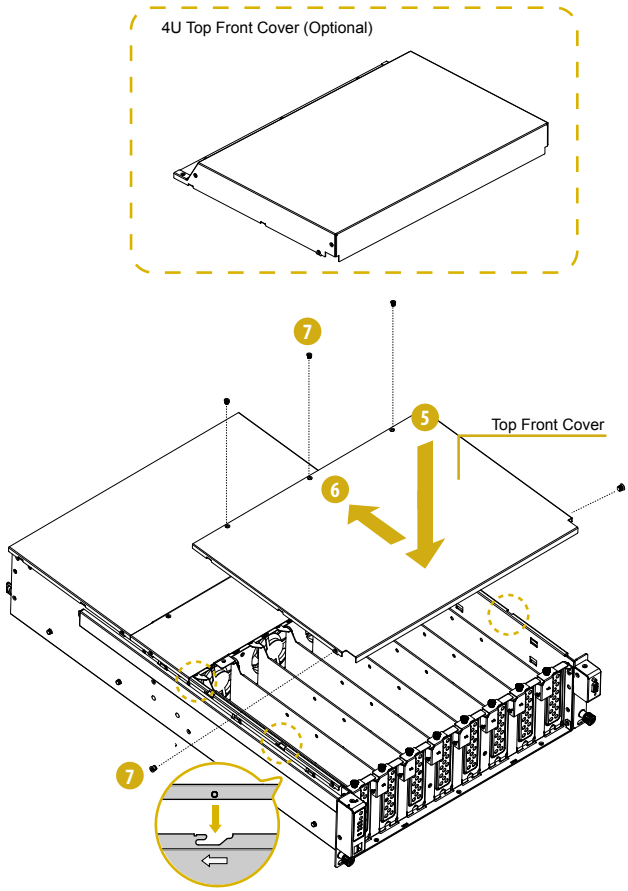


Installing the Server Top Covers

1. Lower the top rear cover on the chassis, making sure the side latches align with the cutouts.
2. Slide the top rear cover toward the REAR of the chassis.
3. Secure the top rear cover with the screws.
4. Lower the top middle cover on the chassis and secure it with the screws.



5. When both top middle and rear covers are properly secured, lower the top front cover on the chassis. Carefully align the mounting holes in the top middle cover and the chassis.
   **Use a 4U top (front) cover instead if the power connectors of your GPGPU card are on the top side of it. Please purchase seperately if needed.*
6. Slide the top front cover toward the REAR of the chassis.
7. Secure the top front cover with the screws.



3.2 Hard Drive

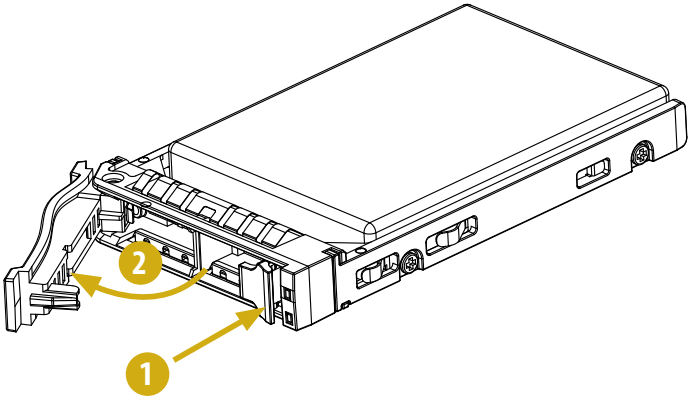
3.2.1 Installing a Hard Disk Drive into 2.5" Hard Drive Tray

The 3U8G+ series chassis supports hot-swappable 2.5" hard drives. Eight 2.5" hard drive trays are located on the rear of the chassis.

> *The illustrations in this document are for reference only, and may be different from the actual product you purchased.*

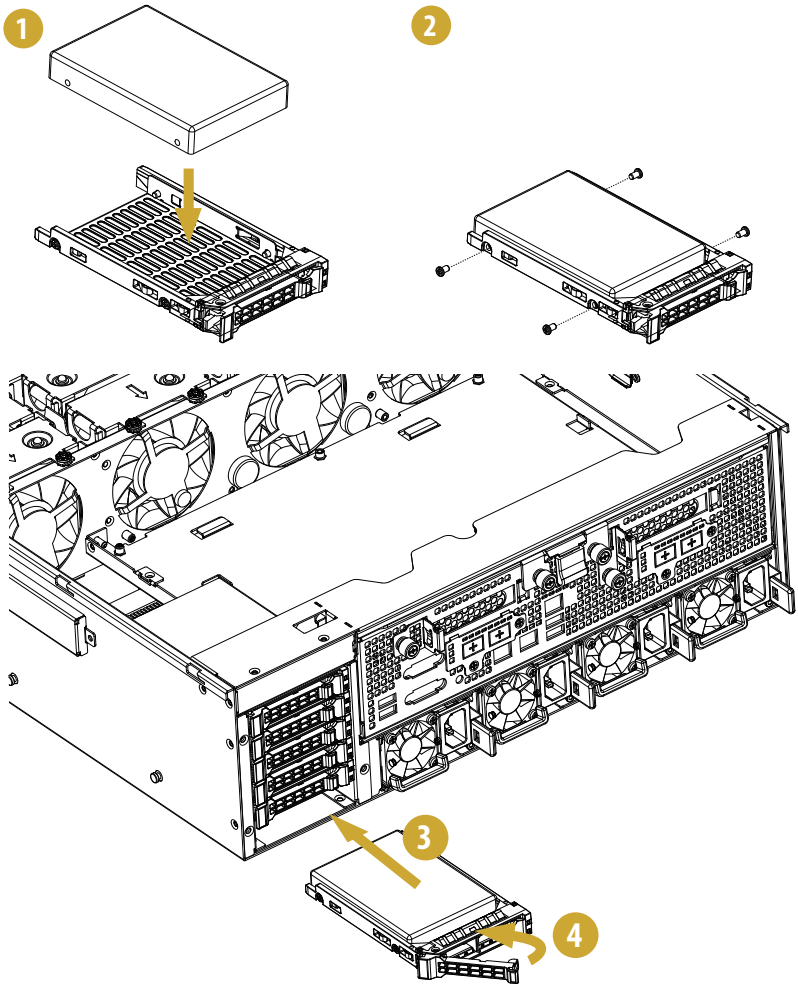
Removing 2.5" Hard Drive Trays from the Chassis

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 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 the two 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 Power Supply

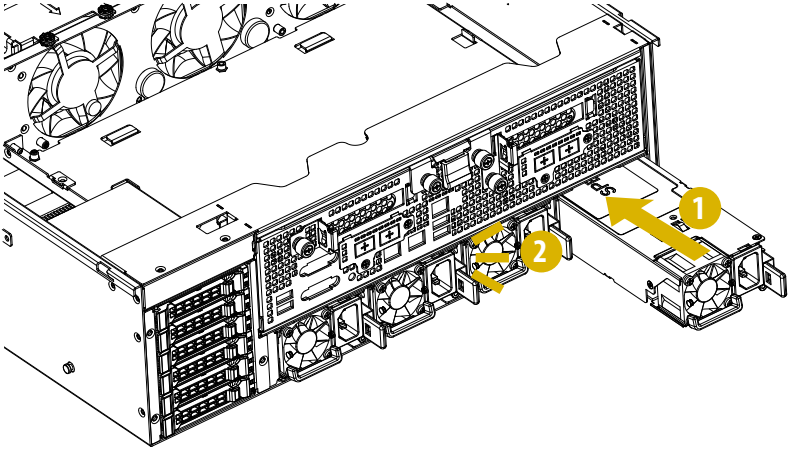
Installing and Removing the Power Supply

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 3U8G+ Series can accommodate four AC or two DC power supplies in the bay at the rear of the chassis. Each unit provides up to 1200 Watts (200V AC) or 1000 Watts (100V AC) of power. Two power supplies are required for full load operation, with the third 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.

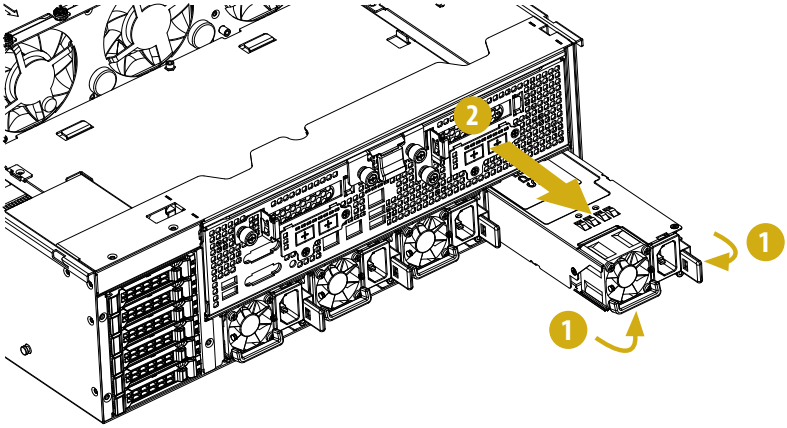


The illustrations in this document are for reference only, and may be different from the actual product you purchased.

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.



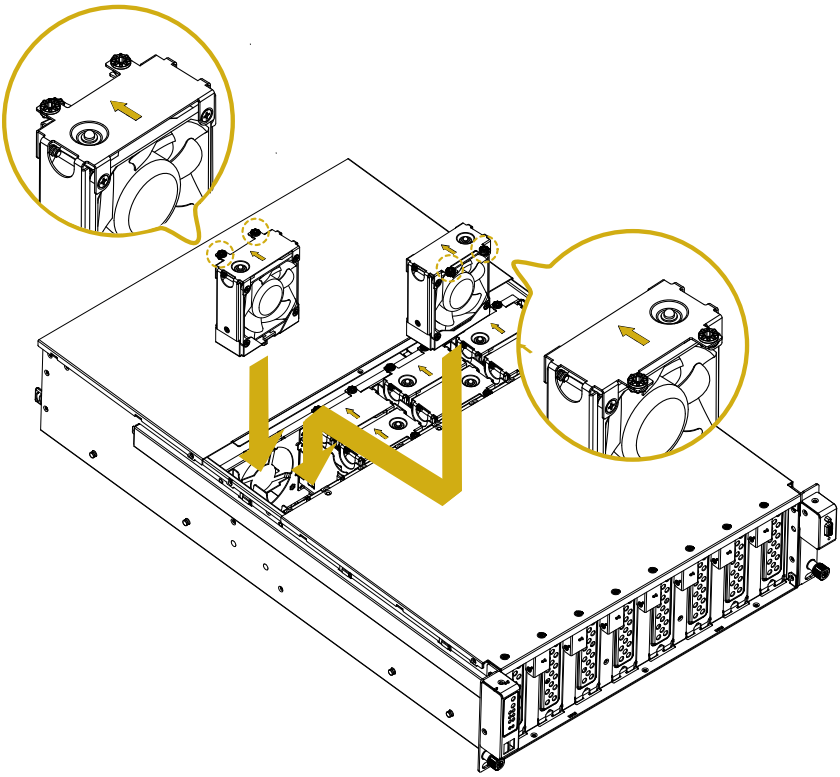
1. Before replacing the power supply, power off the server, unplug the power cord, and disconnect all wiring from the power supply.
2. In a redundant system, you do not need to power down the server.

3.4 System Fan

The 3U8G+ series chassis supports hot-swappable system fans.

Replacing the System Fan

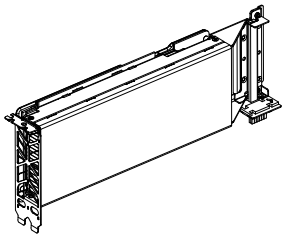
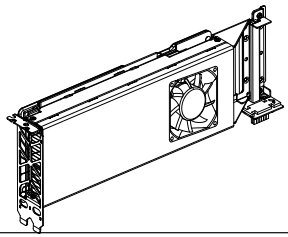
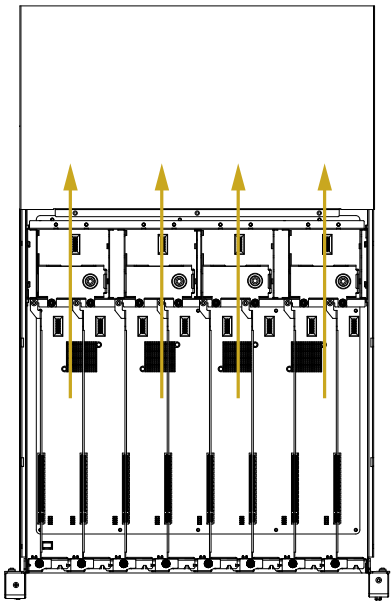
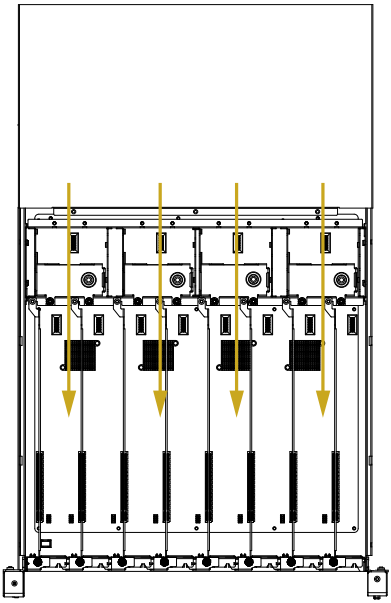
1. Remove the top middle cover from the chassis. (See p. 14 for more details.)
2. Lift to remove the failed fan.
3. Align the mounting holes on the replacement fan corners with the fan mounts on the fan bracket. Make sure the arrow on the fan pointed to the REAR of the chassis.
4. Gently place the fan onto the mounts. Make sure the fan is well seated.



Reversing the Fan Modules (only required for active GPGPU users)

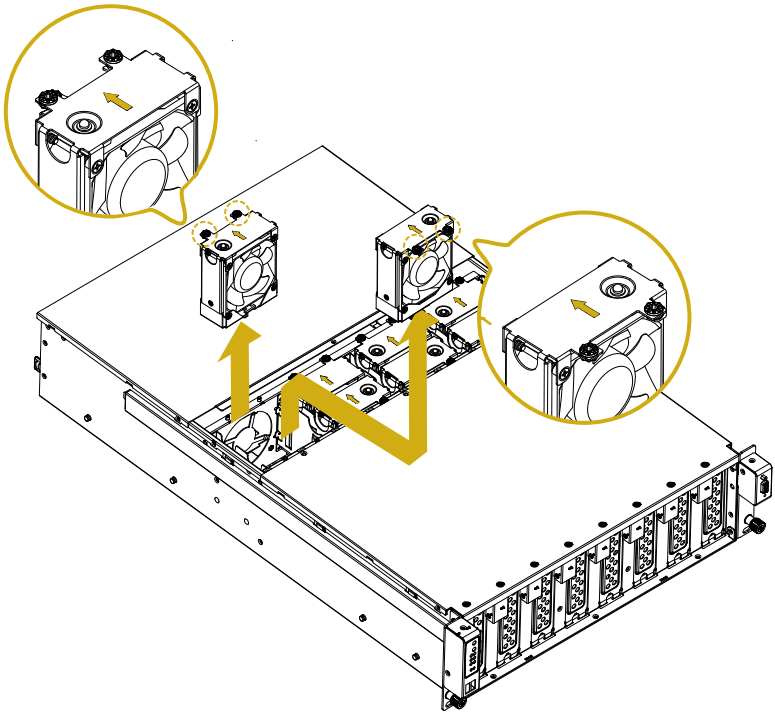
If you are using "active" GPGPU cards that are equipped with one or more fans on the cards, the system requires back-to-front air flow routing, so you need to reverse the fan modules before installing the system fans.

**Be sure to completely power down the system before reversing the fan modules.*

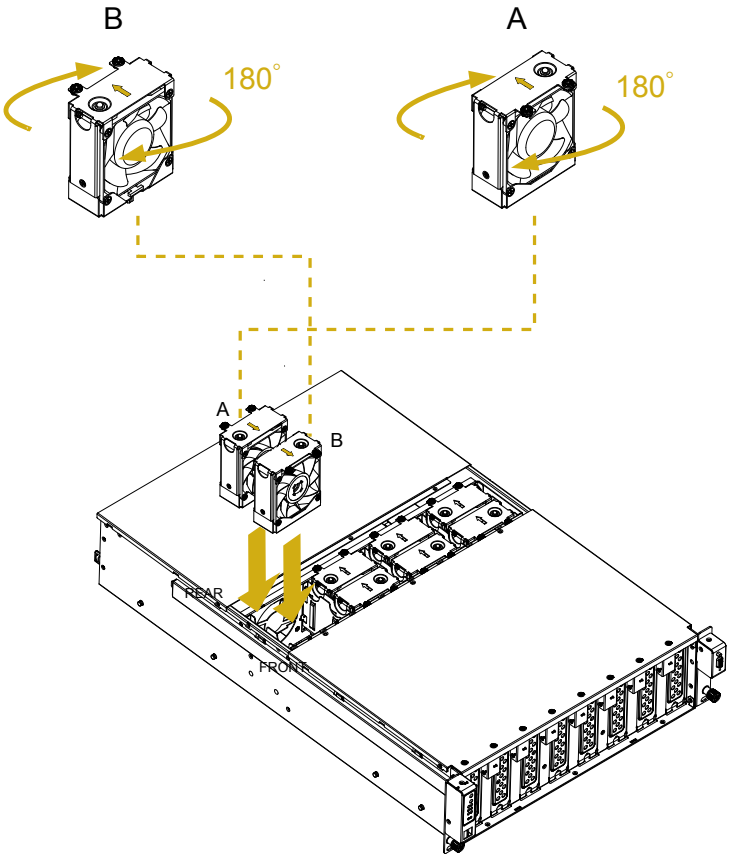
Passive GPU/MIC Card	Active GPU/MIC Card
	
(Default)	Reverse the fan modules
Front-to-back air flow routing	Back-to-front air flow routing
	

To reverse fan modules, please follow the steps below.

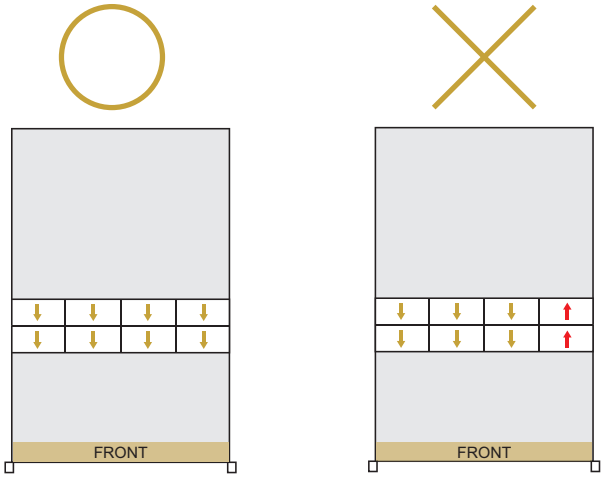
1. Gently lift and remove the fans (A) from the front row and the fans (B) from the rear row.



2. Turn all the four fan modules (A) 180 degrees around. Place them to the rear row.
3. Turn all the four fan modules (B) 180 degrees around. Place them to the front row.



4. Make sure all fans are well seated and all arrows on the fans are pointed to the FRONT of the chassis.

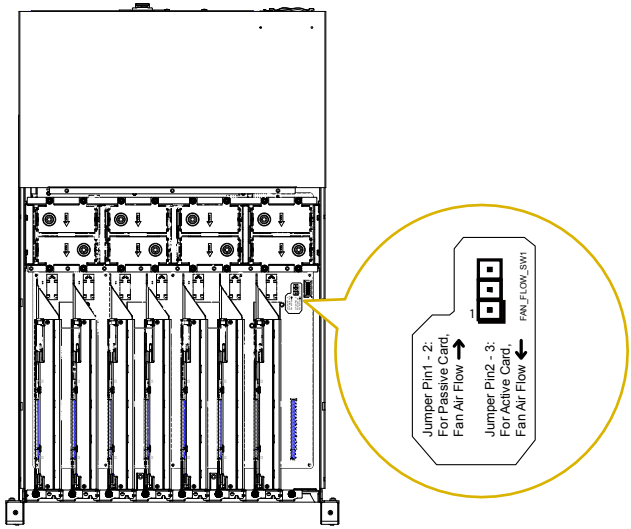


Back-to-front air flow
For active GPU/MIC cards

5. Remove the front top cover and remove the GPGPU card from the Slot 8.

   **For more instructions on how to remove and install a GPGPU card, please refer to the section entitled "3.5 GPG or MIC Card".*

6. Move the jumper caps placed on the FAN Flow Switch Jumper (FAN_FLOW_SW1) from pins 1-2 (default) to pins 2-3 on the switchboard (SWB).



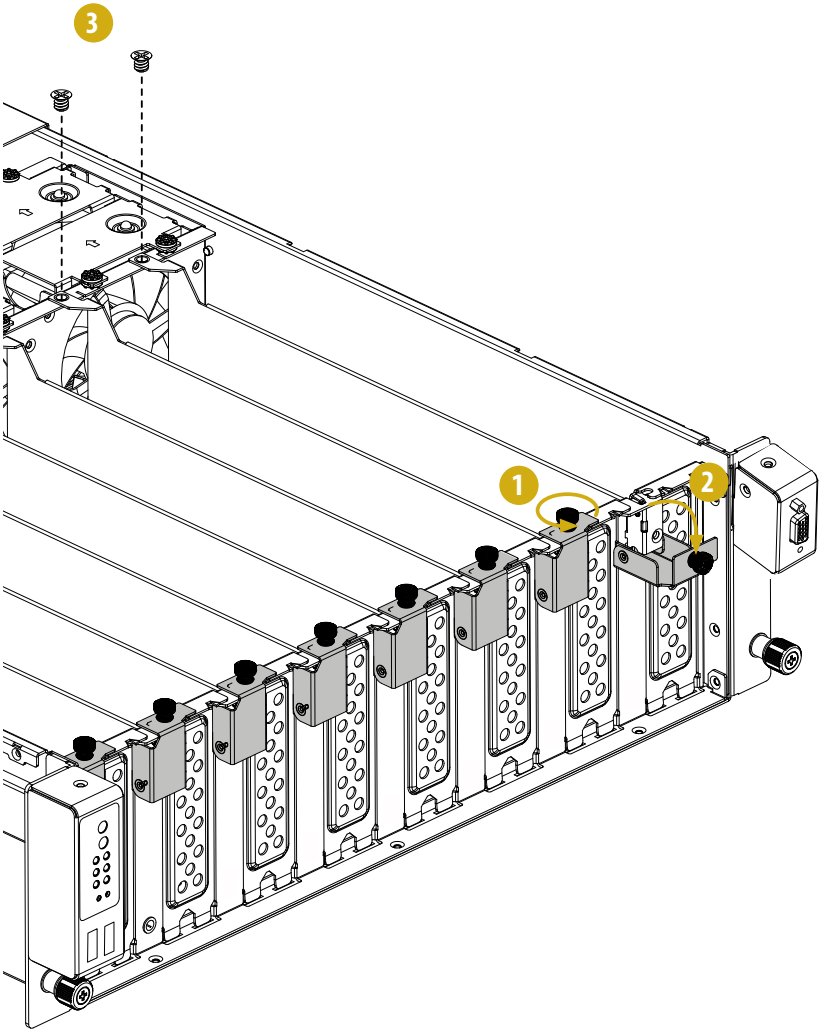
FAN Flow Switch Jumper (3-pin FAN_FLOW_SW1)	1_2 For Passive Card Front-to-back air flow (Default)	2_3 For Active Card Back-to-front air flow

7. Place the GPGPU Card back into the Slot
8. Put the top front cover back. Then power on the system.

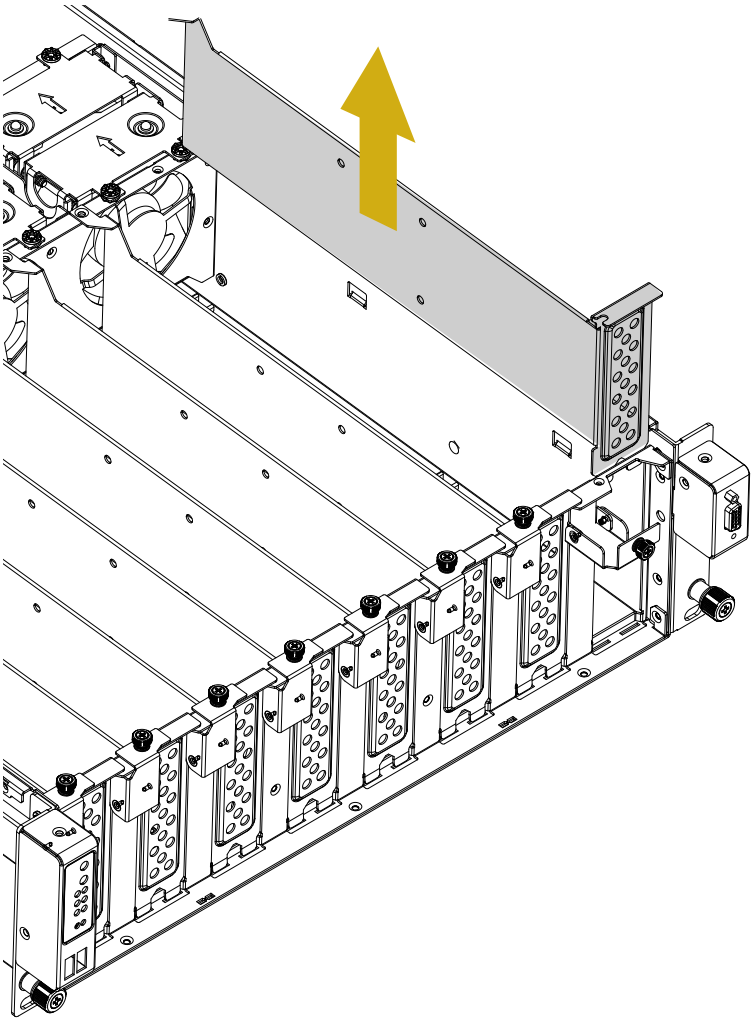
3.5 GPU or MIC Card

Installing and Removing the GPU or MIC Card

1. Release the screw of the GPU/MIC card slot on the front of the chassis.
2. Pull down the retention lever.
3. Release the screw that secures the blanking plate

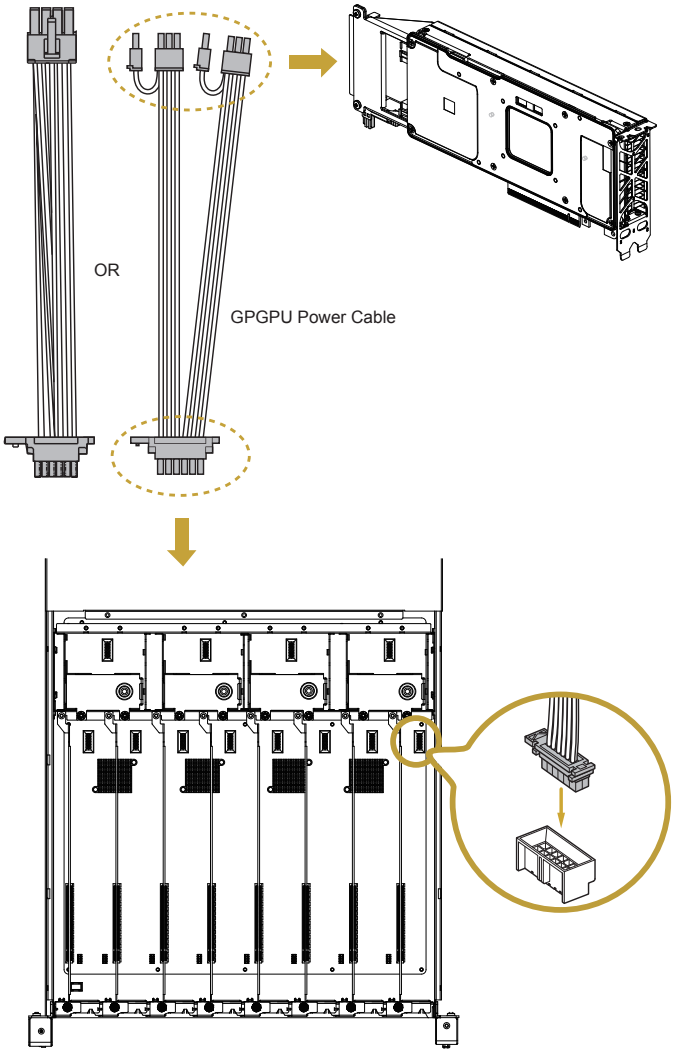


4. Lift to remove the blanking plate.

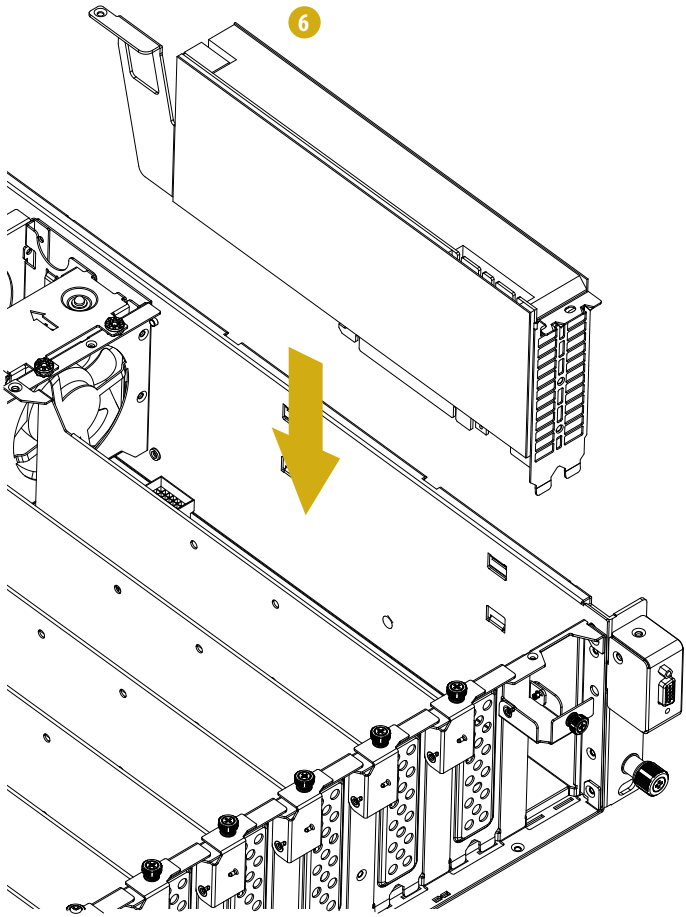


5. Connect the GPGPU Power Cable between a GPU/MIC card and the switchboard. Connect one end (B) of the GPGPU Power Cable to the connector on the switchboard (SWB). Then, connect the other ends (A) to the back of the GPU/MIC card or on the side of the card.

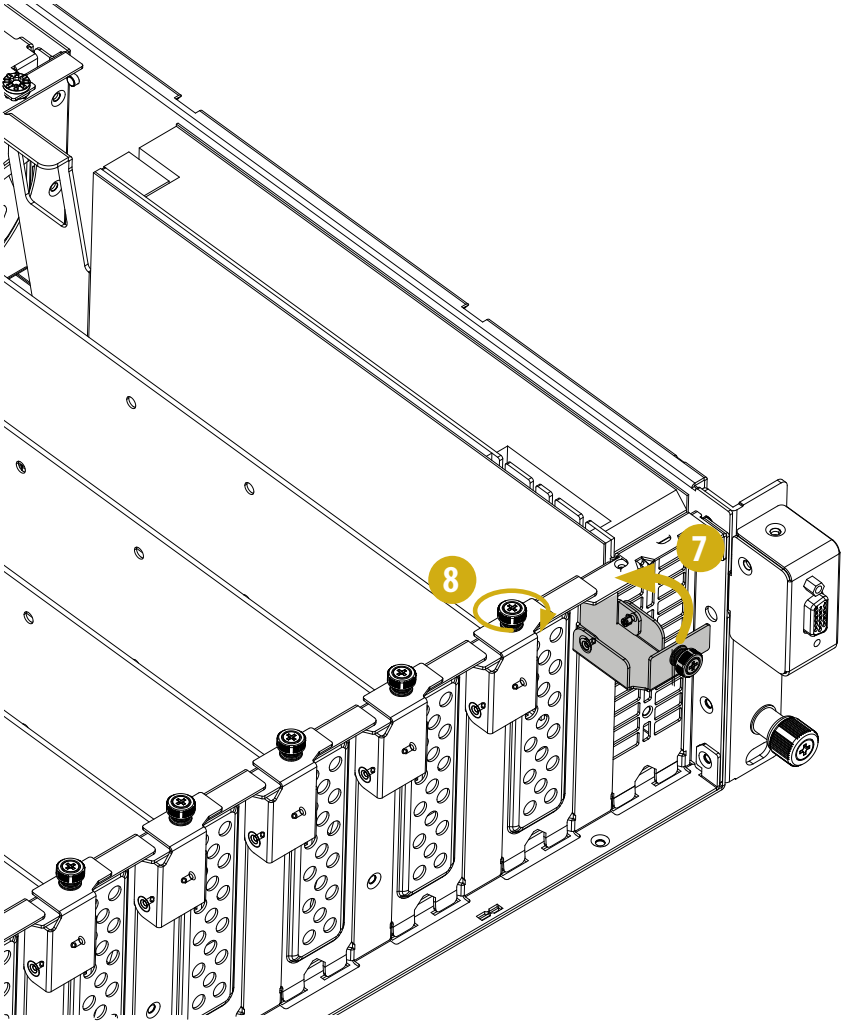
If the power connectors of the GPGPU card you use are on the top side, the connectors and the connected cable will extend the height of the card; thus, you will need a 4U top (front) cover. Please purchase separately if needed. To know how to install top covers, please refer to "3.1 Server Top Cover - Installing the Server Top Covers".



6. Gently place the GPU or MIC card into the empty slot. Make sure the card is well seated.



7. Pull up the retention lever.
8. Hand tighten the screw to secure the inserted GPU/MIC card.



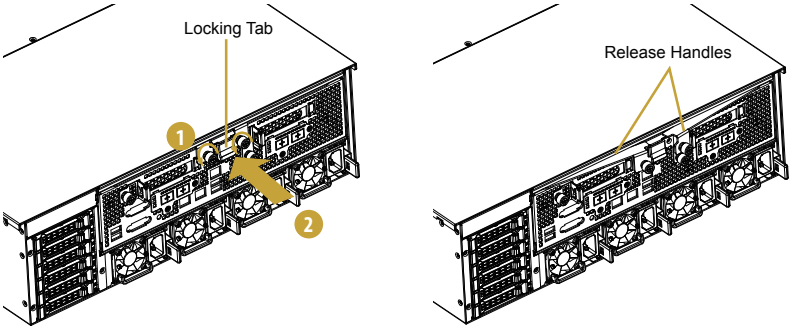
3.6 Motherboard Tray

Attention! DO NOT open the motherboard tray if the server is not powered down or while it is still running.

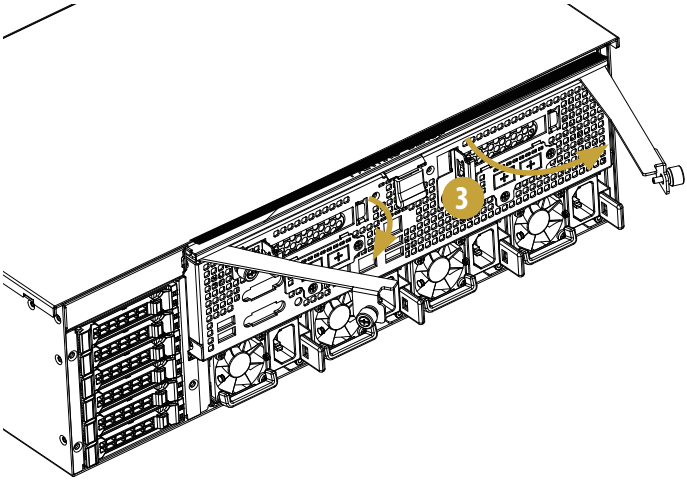
The illustrations in this document are for reference only, and may be different from the actual product you purchased.

Removing the Motherboard Tray

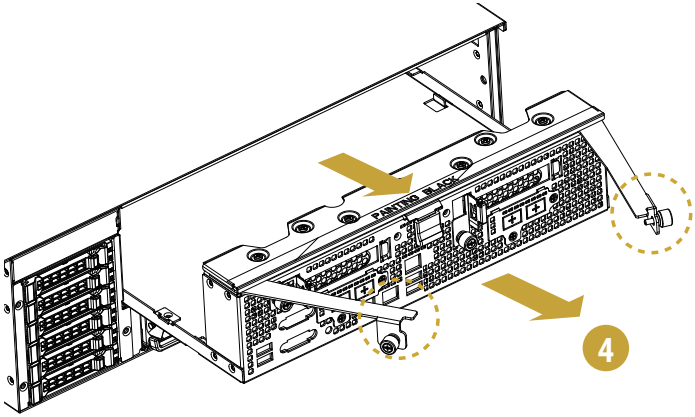
1. Release the two thumb screws on the motherboard tray.
2. Press the locking tab in the middle to release the handles.



3. Rotate and open the release handles on the sides of the motherboard tray to disengage the tray from the chassis.

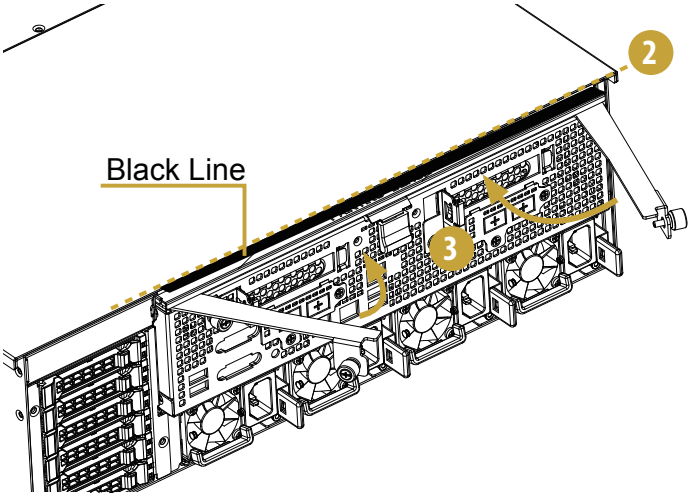


4. Then you can grasp the handles and slide the tray all the way out of the chassis.

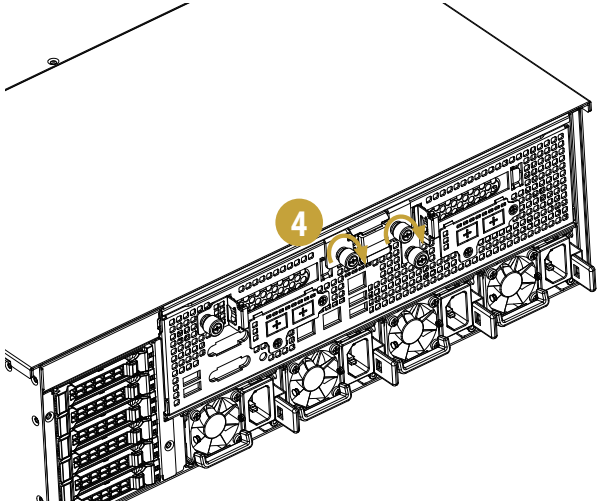


Installing the Motherboard Tray

1. Gently and slowly slide the motherboard tray into the chassis until the black line on the tray almost reaches the edge of the chassis.
2. Make sure the black line on the top edge of the tray is evenly aligned with the edge of the chassis.
3. Then close the release handles completely. Push and make sure the tray moves back fully into the chassis.



4. Tighten the two thumb screws on the motherboard tray.



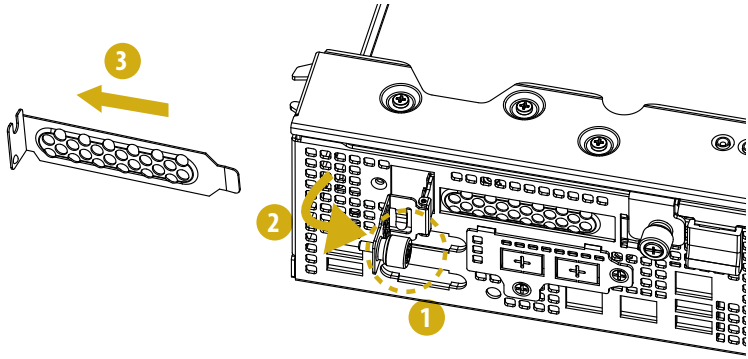
3.7 Add-on Card (Low Profile)

1. *You can install an add-on card to the chassis only when you have a riser card installed on the server board.*
2. *Use a 1U low profile passive heatsink for the processor nearest to the add-on card on your server board.*
3. *Before installing the add-on card, power off the server and unplug the power cord.*

Please be noted that add-on card is supported for certain models only. Please check the rear panel of your chassis and see if a low profile PCI Express slot is provided on the I/O shield.

Removing the Blanking Plate from the Chassis

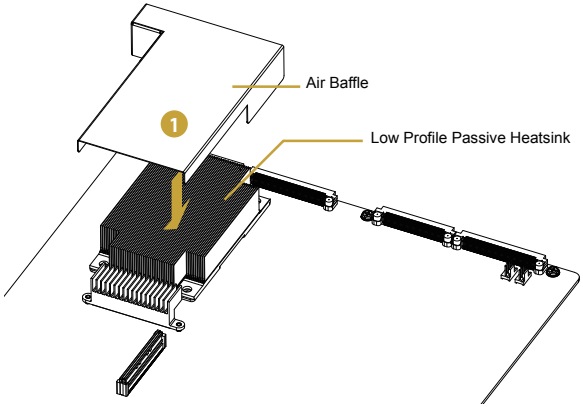
1. Release the thumb screw on the add-on card retainer.
2. Rotate the retainer to release the blanking plate.
3. Slide the blanking plate out sideways.



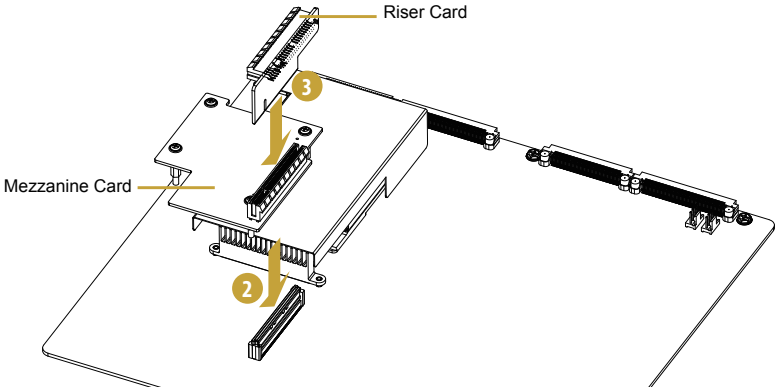
Installing the Add-on Card

Before installing an add-on card, you need to install a mezzanine card and a riser card first. Please refer to the followings for instructions.

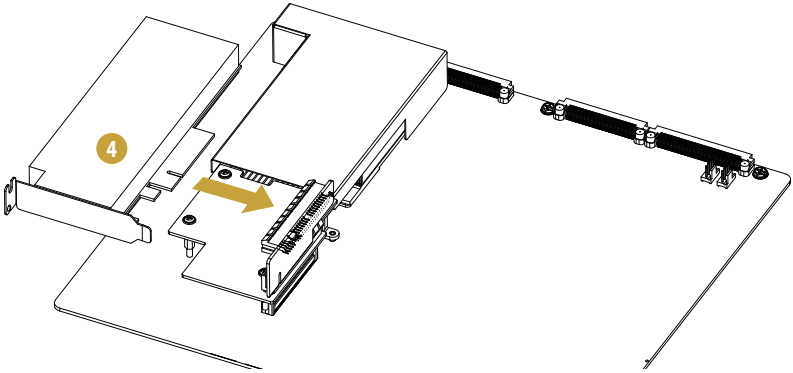
1. Peel off the adhesive backing on the bottom side of the air baffle. Gently attach the air baffle onto the low profile passive heatsink.



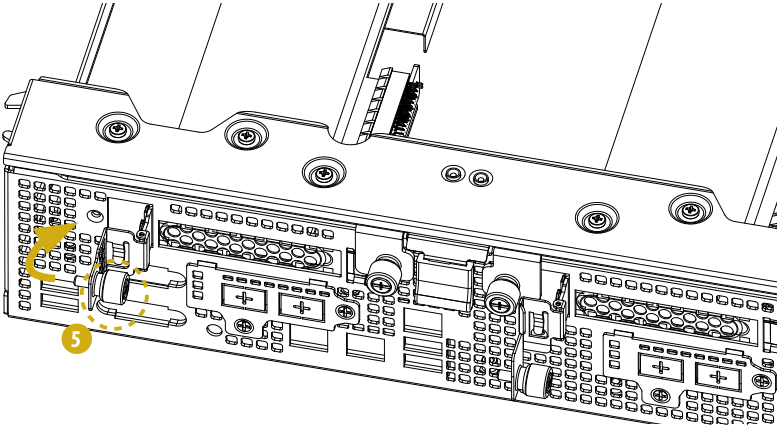
2. Install the mezzanine card as shown below.
3. Install the riser card to the mezzanine card.



4. Install the add-on card, such as a graphics card, to the riser card.



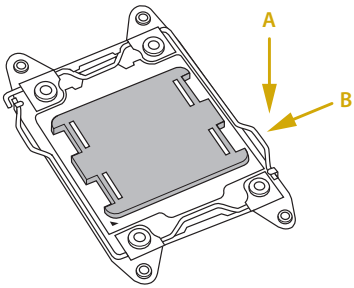
5. Align the plate of the add-on card with the openings in the back of the chassis. Rotate the retainer to secure the card in place. Tighten the thumb screw.



Appendix A

Installing the CPU (Socket: LGA2011 R3)

1



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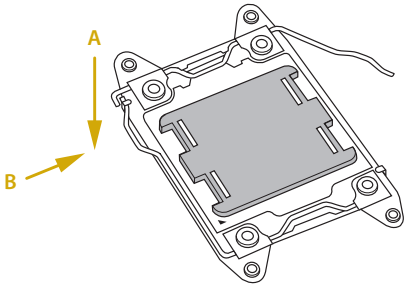

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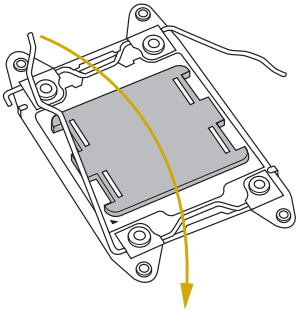

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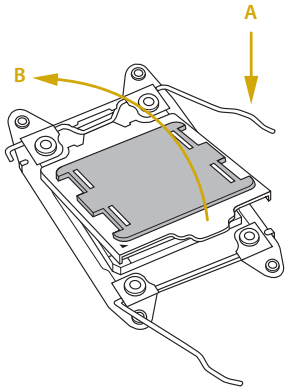

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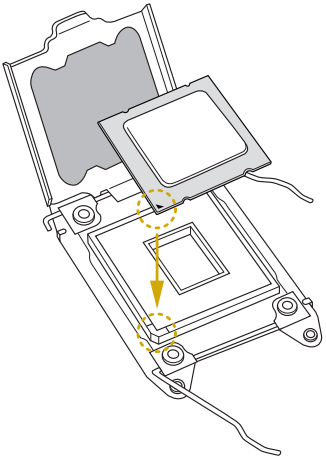

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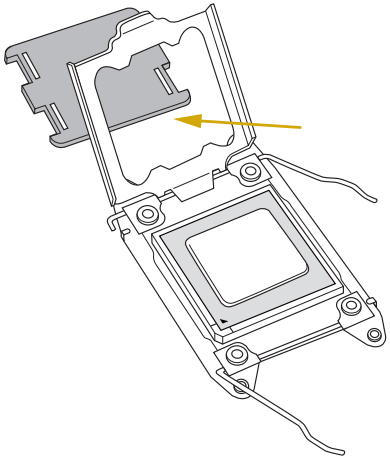

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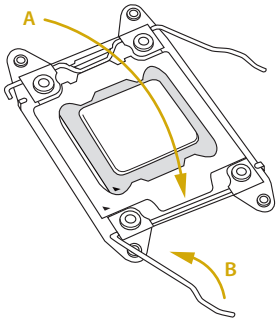

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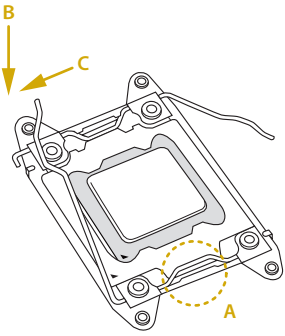

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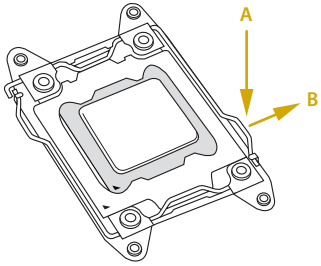
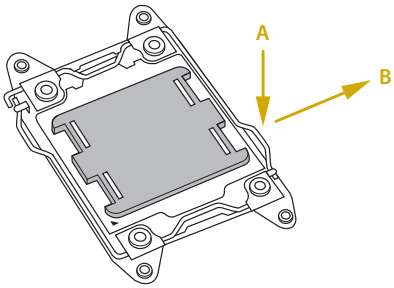


The cover must be placed if returning the motherboard for after service.

Installing the CPU (Socket: LGA2011)

1



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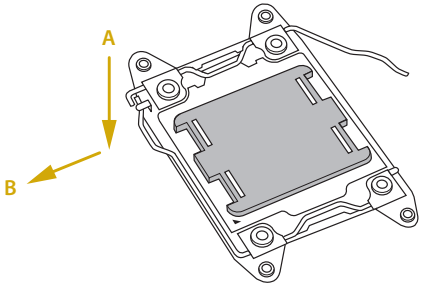

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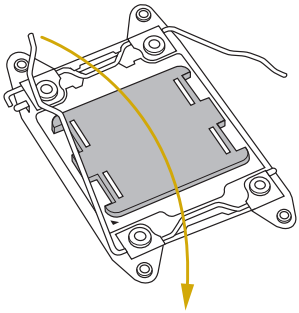

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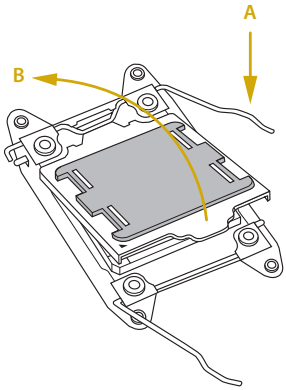

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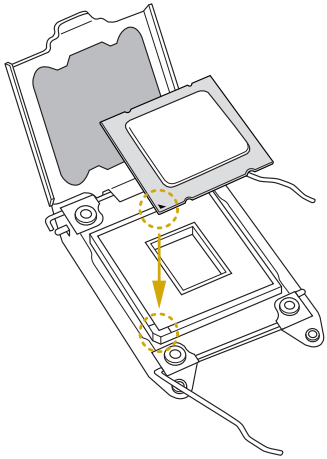

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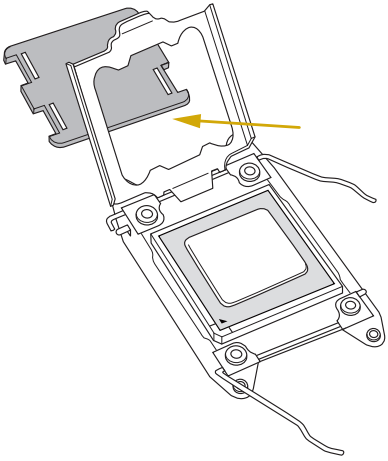

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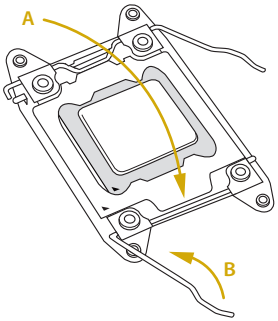

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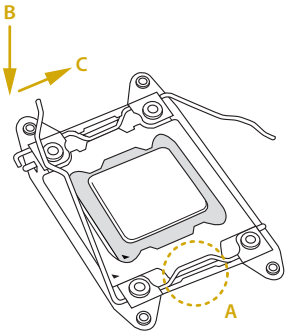

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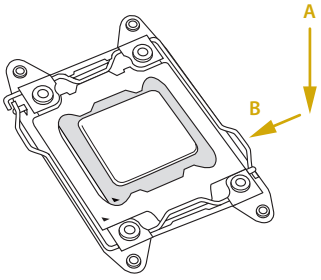
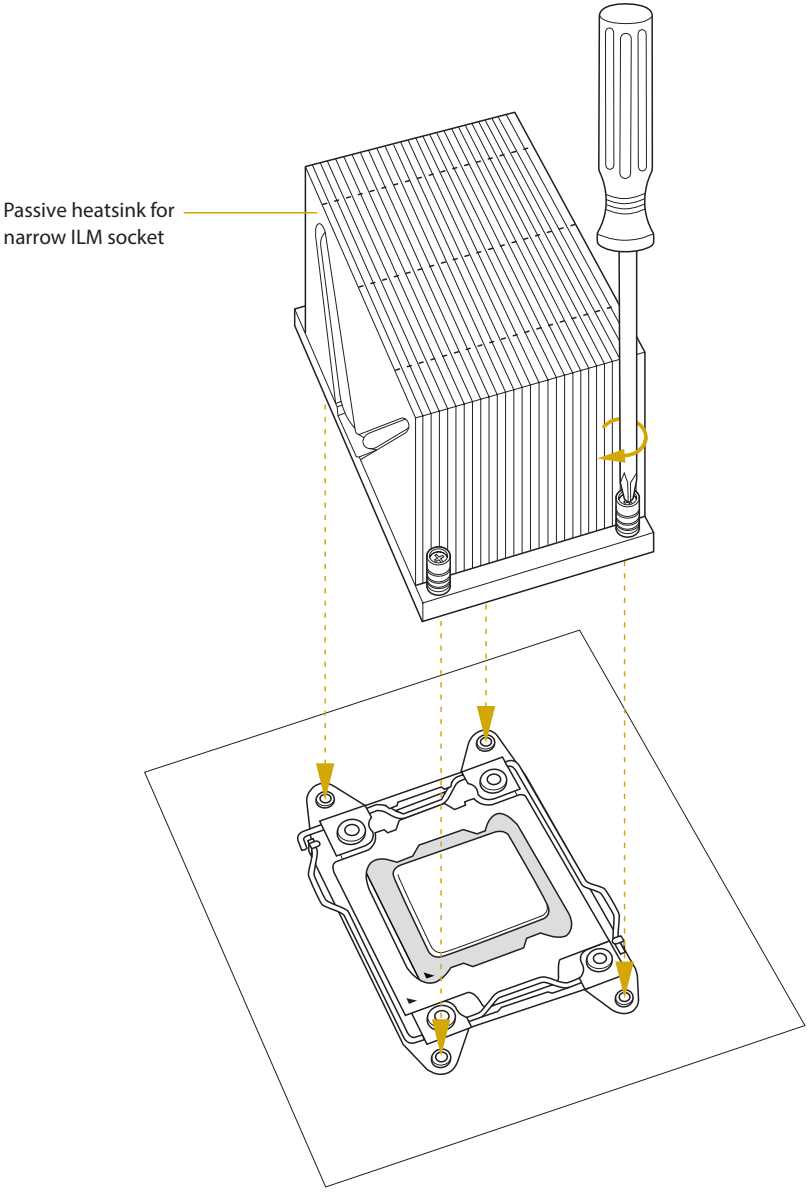


The cover must be placed if returning the motherboard for after service.

Installing the CPU Fan and Heatsink

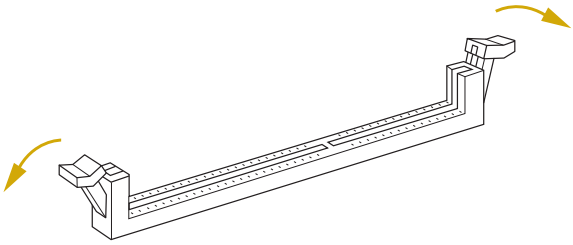
Before you installed the heatsink, you need to spray thermal interface material between the CPU and the heatsink to improve heat dissipation.



Installation of Memory Modules (DIMM)

The DIMM only fits in one correct orientation. It will cause permanent damage to the motherboard and the DIMM if you force the DIMM into the slot at incorrect orientation. For more information about DIMM installation, please refer to the User Manual that comes with the serverboard you use.

1



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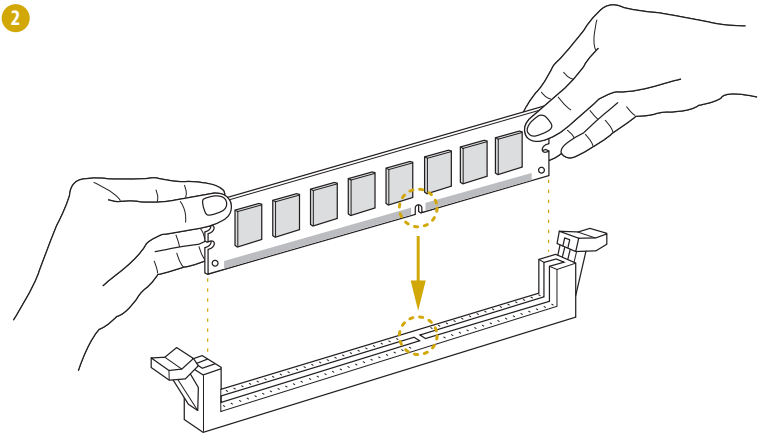

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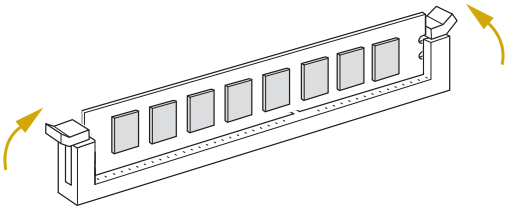


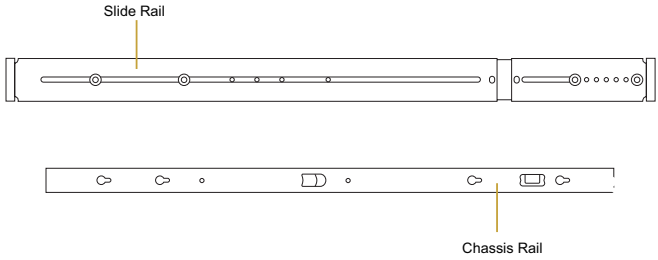
Appendix B

Installing the Server in a Rack

This section describes how to rackmount the server with slide rail assemblies.

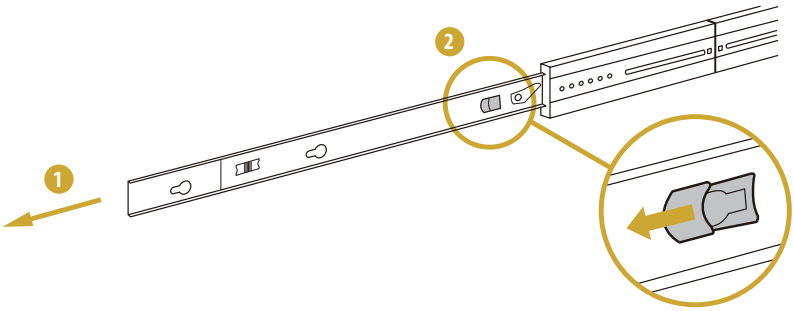
> 1. *The rails installation instructions in this manual are example only, your actual rail assembly procedure may differ slightly .*
> 2. *Please purchase the rail assembly seperately if needed.*

The slide rail assembly consists of a chassis rail and a slide rail.
You need to attach the chassis rails to the server and attach the slide rail assemblies to the rack.



Removing the Chassis Rail from the Slide Rail Assembly

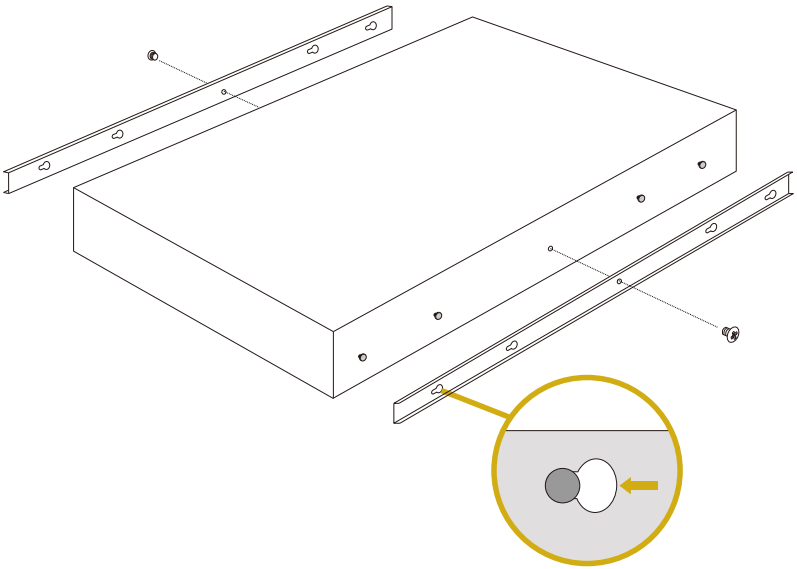
1. Pull out the inner chassis rail from the rail assembly.
2. Push the white chassis rail release button toward the front, and simultaneously withdraw the chassis rail from the slide rail assembly.
3. Repeat for the remaining rail assembly.



To slide a chassis rail back into the slide rail assembly, push the blue release button toward the rear, and simultaneously slide the chassis rail into the slide rail assembly until it is locked and cannot be pushed further.

Attaching the Chassis Rails to the Server

1. Position a chassis rail along one side of the chassis, and align the keyhole openings on the chassis rail with the locating pins on the side of the chassis.
2. Pull the chassis rail toward the front of the chassis until the chassis rail clips. Make sure the rail is installed in the correct direction.
3. Secure the chassis rail to the server chassis with screws.
4. Repeat for the remaining chassis rail.

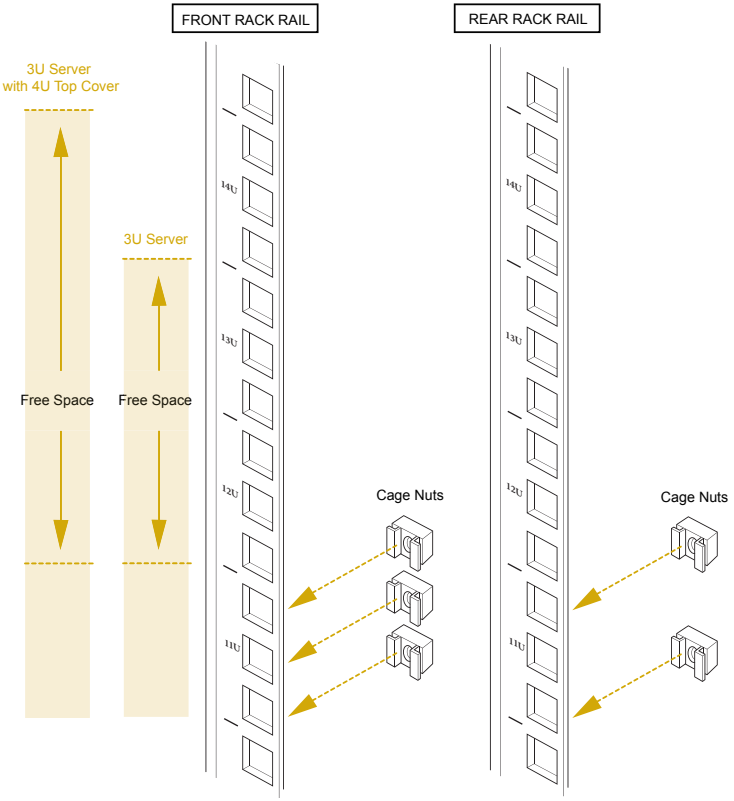


Attaching the Slide Rail Assemblies to the Rack

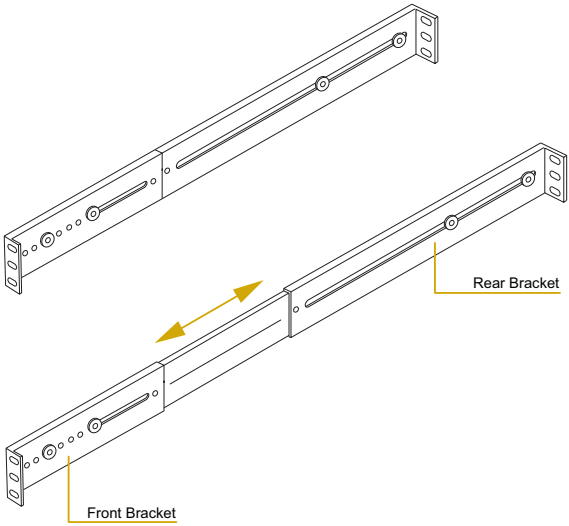
1. Determine where to attach the slide rails. Make sure you have enough free space above the slide rail bracket for the chassis.

   **For a 3U server, 6 holes of free space above the slide rail bracket are required. If you use a 4U top cover for the server, you need to have 9 holes of free space above the slide rail bracket.*

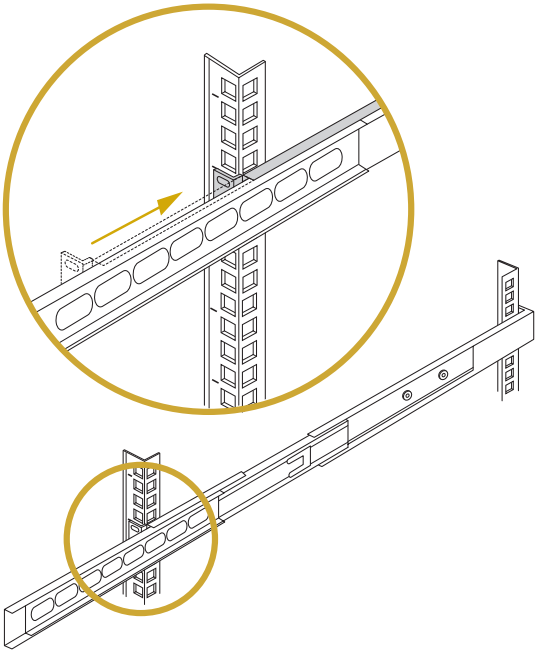
   For the rack with square mounting holes, insert cage nuts in the holes that you will use on the rack.



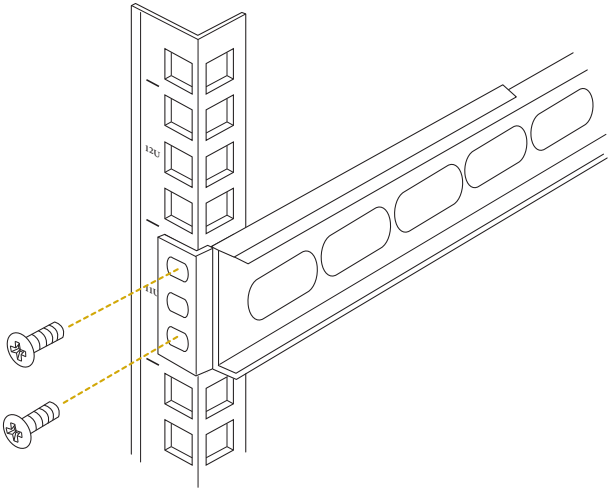
2. Extend the pre-attached front and rear adjustable brackets on the slide. Do not fully tighten the nuts yet.



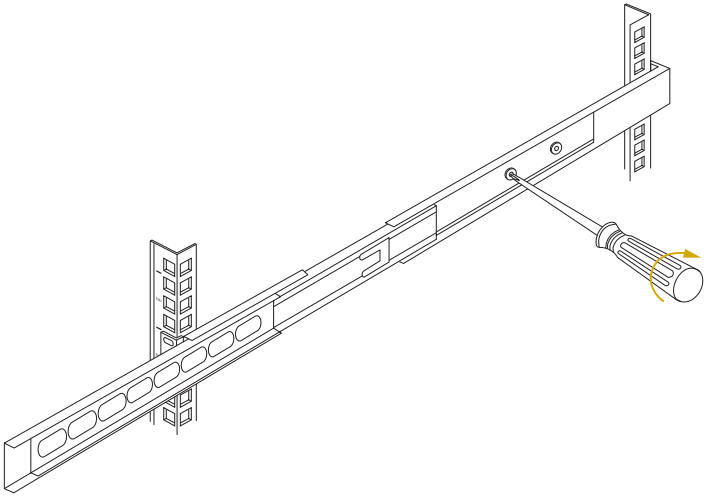
3. Adjust the brackets to accommodate the depth of the rack.



4. Align the holes on the brackets with the mounting holes you selected on the rack.
5. Tighten the screws to secure the slide rails to the rack. Make sure the rear bracket meets the rear vertical rail of the rack.

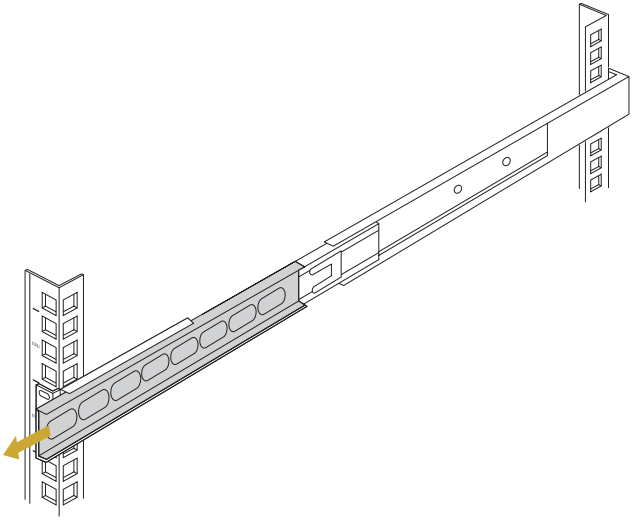


6. Fully tighten the lock nuts on the rear bracket.



Sliding the Server into the Rack

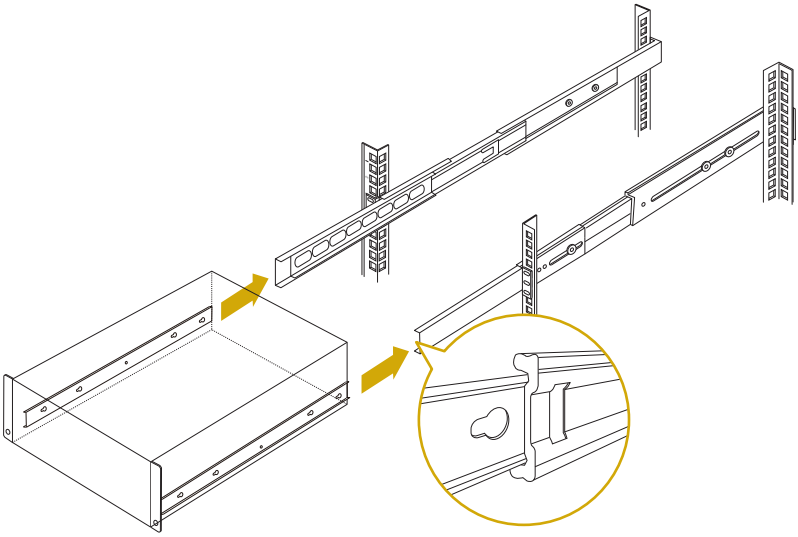
1. Ensure that the slide rails are properly and securely attached to the rack.
2. Fully extend the slide rails from the rack by pulling the inner rails out until they are locked and cannot be pulled out further.



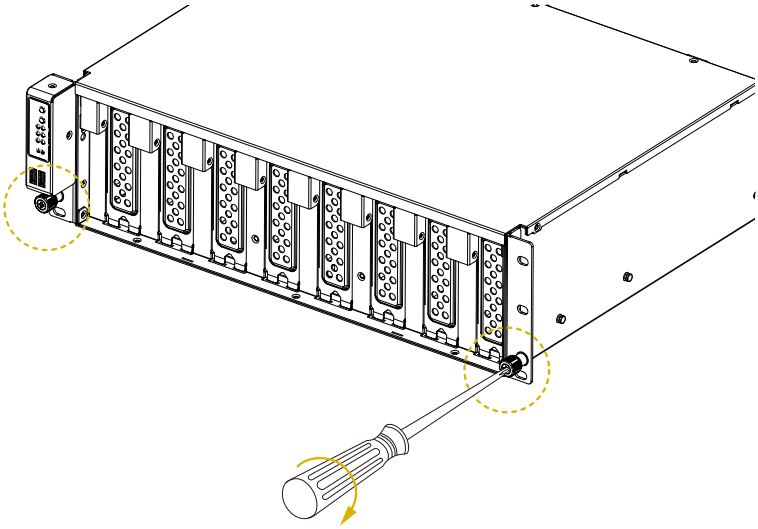
To slide an inner rail back into the slide rail, press the metal tab on the inner rail, and simultaneously slide the inner rail into the slide rail .

3. Slide the server slowly and evenly all the way into the cabinet to ensure that the slide assemblies are working correctly.

> *The server is heavy. For safe lifting, two or more persons are required to install the server into the rack.*



4. Tighten the two thumb screws on the front of the server to secure the server to the rack.
5. To remove the server from the rack, reverse these instructions.



When connecting cables to the server, make sure there is enough cable slack so you can slide the server in and out of the rack without accidentally unplugging a cable.

Optional Accessory

Please purchase the following optional accessory seperately if needed.

Rail Assembly Kit	
Vendor	**Model Name**
KINGSLIDE	3A68-660CP