

# User's Guide

NEC Express Server  
Express5800 Series

## **Express5800/R120h-2M EXP805**

**Chapter 1 General Description**

**Chapter 2 Preparations**

**Chapter 3 Setup**

**Chapter 4 Appendix**

# Manuals

Manuals for this product are provided as booklets

Safety Precautions and Regulatory Notices	Describes points of caution to ensure the safe use of this server. <b><u>Read these cautions before using this server.</u></b>
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Getting Started	Describes how to use this server, from unpacking to operations. See this guide first and read the outline of this product.
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The electronic edition has been published on a website ([http://www.nec.com/ express/](http://www.nec.com/express/)).

## User's Guide

Chapter 1: General Description	Overviews, names, and functions of the server's parts
Chapter 2: Preparations	Installation of additional options, connection of peripheral devices, and suitable location for this server.
Chapter 3: Setup	System utility configurations and summary of EXPRESSBUILDER
Chapter 4: Appendix	Specifications and other information

## Installation Guide (Windows)

Chapter 1: Installing Windows	Installation of Windows and drivers, and precautions for installation
Chapter 2: Installing the Bundled Software	Installation of NEC ESMPRO, and other bundled software

## Maintenance Guide

Chapter 1: Maintenance	Server maintenance and troubleshooting
Chapter 2: Useful Features	The details of system utility settings, RAID Configuration Utility, and EXPRESSBUILDER
Chapter 3: Appendix	Error messages and Windows Event Logs

## Other manuals

The details of NEC ESMPRO, and other features
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# Conventions Used in This Document

## Signs and symbols for safety

WARNING and CAUTION are used in this guide as the following meaning.



**WARNING**







Indicates there is a risk of death or serious personal injury



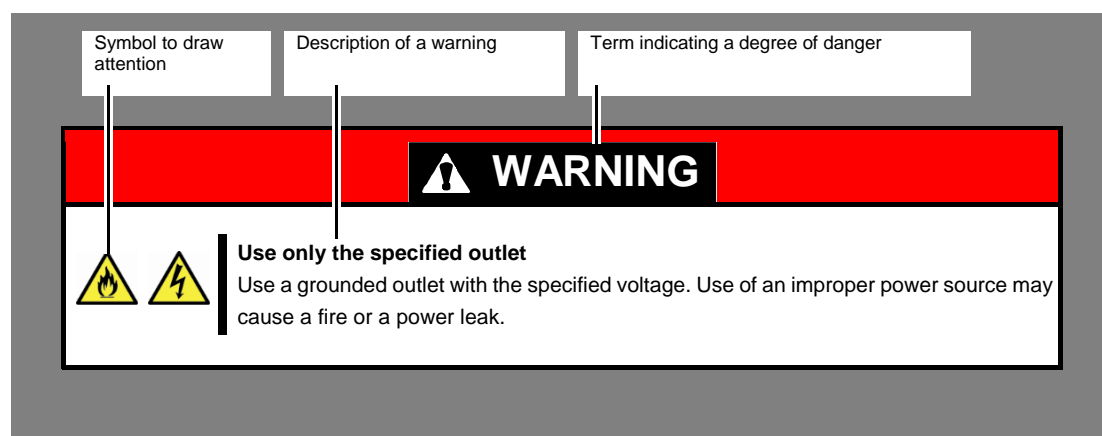
**CAUTION**

Indicates there is a risk of burns, other personal injury, or property damage

Precautions and notices against hazards are presented with one of the following three symbols. The individual symbols are defined as follows:

	<b>Attention</b>	This symbol indicates the presence of a hazard if the instruction is ignored. An image in the symbol illustrates the hazard type.	(Example)  (Electric shock risk)
	<b>Prohibited Action</b>	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action.	(Example)  (Do not disassemble)
	<b>Mandatory Action</b>	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard.	(Example)  (Disconnect a plug)

(Example)



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## Notations used in the text

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In addition to safety-related symbols urging caution, three other types of notations are used in this document. These notations have the following meanings.

<b>Important</b>	Indicates critical items that must be followed when handling hardware or operating software. If the procedures described are not followed, <b><u>hardware failure, data loss, and other serious malfunctions could occur.</u></b>
<b>Note</b>	Indicates items that must be confirmed when handling hardware or operating software.
<b>Tips</b>	Indicates information that is helpful to keep in mind when using this server.

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## Optical disk drive

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This server is equipped with one of the following drives. These drives are referred to as *optical disk drive* in this document.

- DVD-ROM drive
- DVD Super MULTI drive

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## Hard disk drive

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Unless otherwise stated, *hard disk drive* described in this document refer to both of the following.

- Hard disk drive (HDD)
- Solid state drive (SSD)

---

## Abbreviations of Operating Systems (Windows)

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Windows Operating Systems are referred to as follows.

**See *Chapter 1 (1.2 Supported Windows OS) in Installation Guide (Windows)* for detailed information.**

Notations in this document	Official names of Windows
Windows Server 2016	Windows Server 2016 Standard
	Windows Server 2016 Datacenter
Windows Server 2012 R2	Windows Server 2012 R2 Standard
	Windows Server 2012 R2 Datacenter

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## POST

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POST described in this manual refers to the following.

- Power On Self-Test

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## BMC

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BMC described in this manual refers to the following.

- Baseboard Management Controller

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## **zlib End User License Agreement**

zlib License

zlib.h -- interface of the 'zlib' general purpose compression library  
version 1.2.2, October 3rd, 2004

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**Keep this document for future use**

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## Latest editions

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This document was created based on the information available at the time of its creation. The screen images, messages and procedures are subject to change without notice. Substitute as appropriate when content has been modified.

The most recent version of this guide, as well as other related documents, is also available for download from the following website.

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## Safety notes

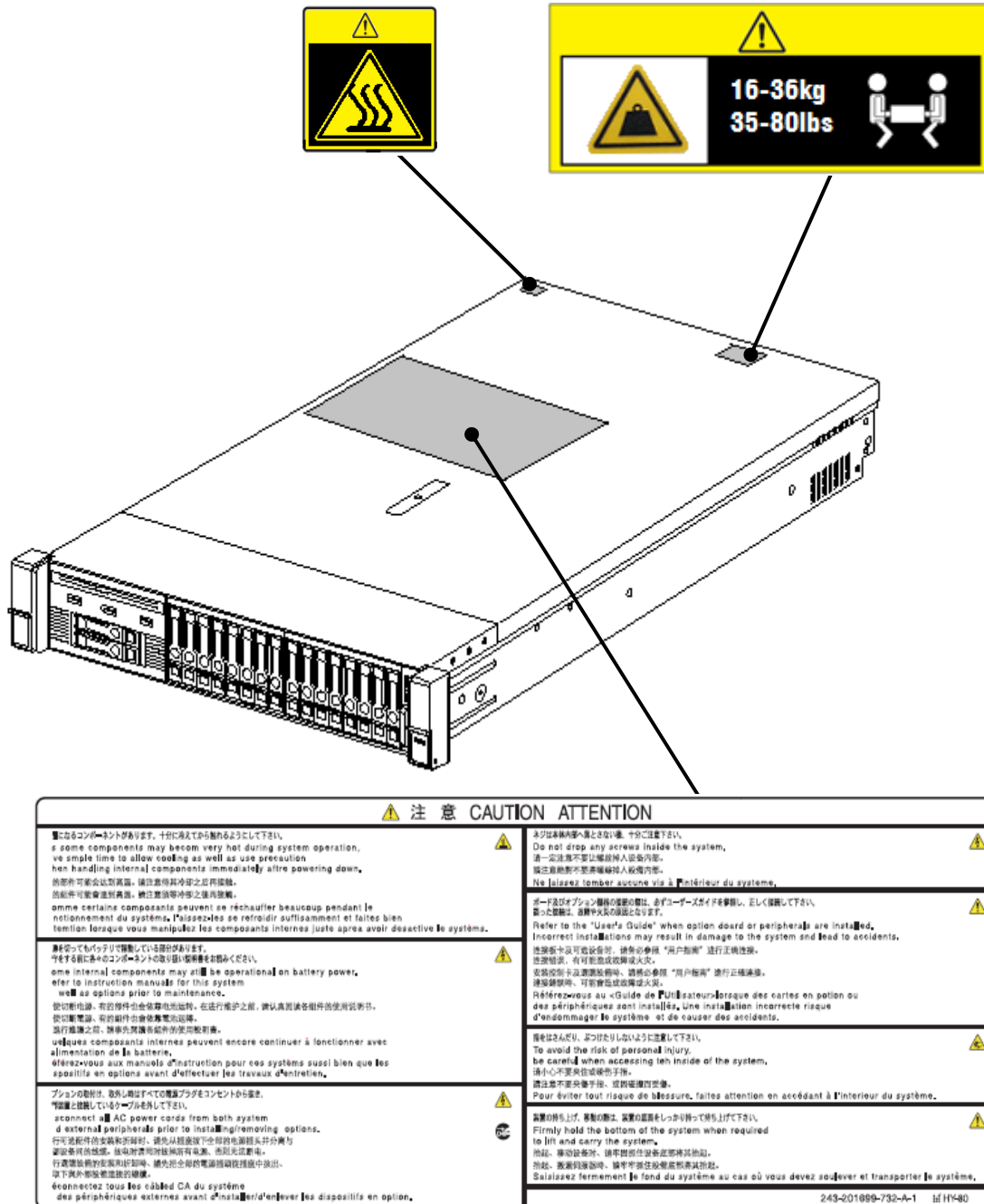
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To use this server safely, read thoroughly "Safety Precautions and Regulatory Notices" that comes with your server.

## Warning label

Warning label are attached on or near the components with potential hazards. This label is either attached or printed on the component.

Do not remove or black out this label and keep it clean. If no label is attached or printed on the server, contact your sales representative.



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## Handling precautions (for proper operations)

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Be sure to observe the following precautions for the proper functioning of the server. Ignoring the precautions may cause server malfunction or failure.

- Do not use any cellphones and switch off them near the server. Electric waves from such devices can cause server to malfunction.
- Install the server in an appropriate place. For details about the installation location, see *Chapter 2 Preparations (2. Installation and Connection)*.
- Before connecting/removing cables to/from peripheral devices, make sure that the server is off and unplug the power cord, if they are non plug-and-play devices.
- Connect the provided power cord to a 100/200 VAC outlet.
- Make sure that the access LED on the server is off before turning off the power or ejecting an optical disk.
- Wait for at least 30 seconds before connecting power cord to power outlet after disconnecting it.
- If any Uninterruptible Power Supply (UPS) unit is connected, set it to wait for at least 30 seconds before turning on the server after power off.
- Do not power off or reset the server, nor disconnect the power cord before POST completes.
- Turn off the server and unplug the power cord before moving it.
- Regularly clean the server to prevent various types of failure. See *Chapter 1 Maintenance (2. Daily Maintenance)* in "Maintenance Guide" for details about cleaning.
- Momentary voltage drop may occur due to lightning strike. To prevent this, use of UPS is recommended.
- In the following cases, check and adjust the system clock before operation.
  - After transportation
  - After storage
  - After the server is used following a period of disuse, in which storage conditions did not conform to those that guarantee server operations (temperature: 10 to 35°C; humidity: 8% to 90%).
- Check the system clock approximately once per month. Use of a time server (NTP server) is recommended if high accuracy timing is required by the system.
- Observe the storage conditions (Temperature: -30°C to 60°C, Humidity: 5% to 95%, No condensation of moisture) to store the server. If this server, internal optional devices, and media set for the backup devices (tape cartridges) are moved from a cold place to a warm place in a short time, condensation will occur and cause malfunctions and failures when these are used in such state. To protect important stored data and property, make sure to wait for a sufficient period to use the server and components in the operating environment.
  - Reference: Time effective at avoiding condensation in winter (more than 10°C differences between the room temperature and atmospheric temperature)
  - Disk devices: Approximately 2 to 3 hours
  - Tape media: Approximately 1 day
- This server does not support hibernation/standby function.
- For optional devices, we recommend you use our NEC products. Even if they are successfully installed or connected, installation of unsupported devices can cause the server to malfunction or even failure. You will be charged to repair failure or damage caused by use of such products even within warranty period.

## Tips for your health and safety

Using a computer extensively may affect different parts of your body. Here are tips you should follow while working on a computer to minimize strain on your body.

### Keep proper posture

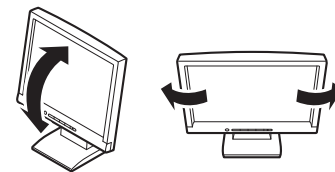
The basic body position for using a computer is sitting straight with your hands on the keyboard parallel with the floor, and your eyes directed slightly downward toward the monitor. With the proper posture described above, no unnecessary strain is applied on any part of your body, in other words when your muscles are most relaxed.

Working on the computer with bad posture such as hunching over or being too close to the monitor could cause fatigue or deteriorated eyesight.



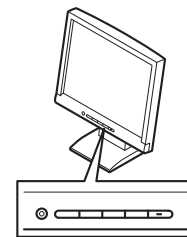
### Adjust the angle of your display

Most display units are designed for adjustment of the horizontal and vertical angles. This adjustment is important to prevent the screen from reflecting bright lights and to make the display contents easy to see. Working without adjusting the display to a comfortable angle makes it difficult for you to maintain a proper posture and you will get tired easily. Adjust the viewing angle before use.



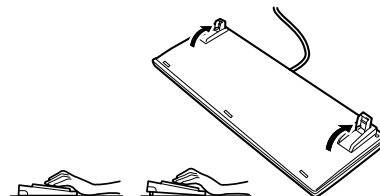
### Adjust the brightness and contrast of the display

Display screens have functions to control brightness and contrast. The most suitable brightness/contrast depends on age, individuals, and environment, so adjust it to suit your preferences. A too bright or too dark display is bad for your eyes.



### Adjust the angle of keyboard

Some keyboards are ergonomically designed, which allow the angle to be adjusted. Adjusting the angle of the keyboard is effective to reduce tension on your shoulders, arms, and fingers.



### Clean your equipment

Keeping your equipment clean is important not only for the appearance but also for functional and safety reasons. A dusty monitor makes it difficult to see the display contents, so clean it regularly.

### Take rest breaks

When you feel tired, take a break. Light exercise is also recommended.



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# **General Description**

This chapter introduces the features of this server and the name of each part

**1. Introduction**

**2. Accessories**

Describes the accessories of the server.

**3. Features**

Describes the features of the server and the server management.

**4. Names and Functions of Parts**

Describes the name of each part contained in this server.

---

# **1. Introduction**

---

Thank you for purchasing this NEC Express5800 Series product.

This server is powered by the latest microprocessor "Intel® Xeon® processor".

With our latest technology and architecture, we offer "high performance" and "high reliability" that could not be accomplished by conventional servers. Furthermore, with its design for "extensibility," our servers can be widely used for general purpose. For proper use of the unit, read this manual carefully to fully understand handling of the product.

---

## 2. Accessories

---

The carton box contains various accessories which are required for setup or maintenance. **Make sure you have them all** for future use.

The rack or server chassis includes all rack-mounting hardware parts required for the server installation.

- Power cord
- Manual and software products
- Rack-mounting hardware and documentation
- Front Bezel
- Bezel Lock Key (attached to Front Bezel)
- Safety Precautions and Regulatory Notices
- Getting Started

In addition to these enclosed items, the following extra items may be required.

- Operating system or application software
- Hardware options
- Drivers (Hexalobular Standard, etc.)

Check whether all parts are present and complete. If some parts are missing or damaged, contact the applicable vendor.

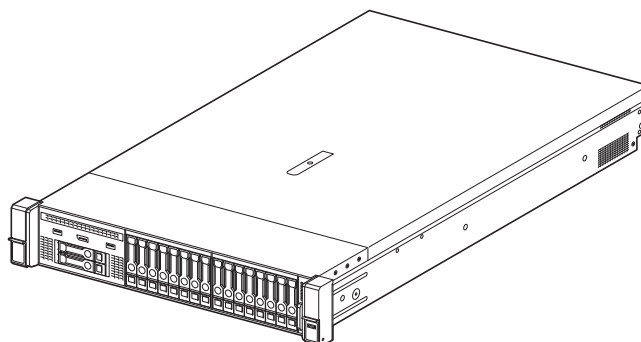
**Important**

The chassis serial number plate and maintenance label is located on the server. If the serial number does not match the number on the warranty, you may not be guaranteed against failure even within the warranty period. Contact your sales representative if they do not match.



## 3. Features

The server has the following features.



### High performance

- Intel® Xeon® Processor Scalable Family

- Xeon Bronze 3104 Processor (1.70 GHz, 6C/6T, 8.25MB, TDP 85W) \*11,
- Xeon Bronze 3106 Processor (1.70 GHz, 8C/8T, 11MB, TDP 85W) \*11,
- Xeon Silver 4108 Processor (1.80 GHz, 8C/16T, 11MB, TDP 85W),
- Xeon Silver 4110 Processor (2.10 GHz, 8C/16T, 11MB, TDP 85W),
- Xeon Silver 4112 Processor (2.60 GHz, 4C/8T, 8.25MB, TDP 85W),
- Xeon Silver 4114 Processor (2.20 GHz, 10C/20T, 13.75MB, TDP 85W),
- Xeon Silver 4116 Processor (2.10 GHz, 12C/24T, 16.50MB, TDP 85W),
- Xeon Gold 5115 Processor (2.40 GHz, 10C/20T, 13.75MB, TDP 85W),
- Xeon Gold 5118 Processor (2.30 GHz, 12C/24T, 16.50MB, TDP 105W),
- Xeon Gold 5120 Processor (2.20 GHz, 14C/28T, 19.25MB, TDP 105W),
- Xeon Gold 5122 Processor (3.60 GHz, 4C/8T, 16.50MB, TDP 105W),
- Xeon Gold 6126 Processor (2.60 GHz, 12C/24T, 19.25MB, TDP 125W),
- Xeon Gold 6128 Processor (3.40 GHz, 6C/12T, 19.25MB, TDP 115W),
- Xeon Gold 6130 Processor (2.10 GHz, 16C/32T, 22MB, TDP 125W),
- Xeon Gold 6132 Processor (2.60 GHz, 14C/28T, 19.25MB, TDP 140W),
- Xeon Gold 6134 Processor (3.20 GHz, 8C/16T, 24.75MB, TDP 130W),
- Xeon Gold 6136 Processor (3 GHz, 12C/24T, 24.75MB, TDP 150W),
- Xeon Gold 6138 Processor (2GHz, 20C/40T, 27.50MB, TDP 125W),
- Xeon Gold 6140 Processor (2.30 GHz, 18C/36T, 24.75MB, TDP 140W),
- Xeon Gold 6142 Processor (2.60 GHz, 16C/32T, 22MB, TDP 150W),
- Xeon Gold 6144 Processor (3.50 GHz, 8C/16T, 24.75MB, TDP 150W),
- Xeon Gold 6146 Processor (3.20 GHz, 12C/24T, 24.75MB, TDP 165W),
- Xeon Gold 6148 Processor (2.40 GHz, 20C/40T, 27.50MB, TDP 150W),
- Xeon Gold 6150 Processor (2.70 GHz, 18C/36T, 24.75MB, TDP 165W),
- Xeon Gold 6152 Processor (2.10 GHz, 22C/44T, 30.25MB, TDP 140W),
- Xeon Gold 6154 Processor (3GHz, 18C/36T, 24.75MB, TDP 200W),
- Xeon Platinum 8153 Processor (2 GHz, 16C/32T, 22MB, TDP 125W),
- Xeon Platinum 8156 Processor (3.60 GHz, 4C/8T, 16.50MB, TDP 105W),
- Xeon Platinum 8158 Processor (3GHz, 12C/24T, 24.75MB, TDP 150W),

- Xeon Platinum 8160 Processor (2.10 GHz, 24C/48T, 33MB, TDP 150W),
  - Xeon Platinum 8164 Processor (2GHz, 26C/52T, 35.75MB, TDP 150W),
  - Xeon Platinum 8168 Processor (2.70 GHz, 24C/48T, 33MB, TDP 205W),
  - Xeon Platinum 8170 Processor (2.10 GHz, 26C/52T, 35.75MB, TDP 165W),
  - Xeon Platinum 8176 Processor (2.10 GHz, 28C/56T, 38.50MB, TDP 165W),
  - Xeon Platinum 8180 Processor (2.50 GHz, 28C/56T, 38.50MB, TDP 205W),
  - Xeon Gold 6134M Processor (3.20 GHz, 8C/16T, 24.75MB, TDP 130W),
  - Xeon Gold 6140M Processor (2.30 GHz, 18C/36T, 24.75MB, TDP 140W),
  - Xeon Gold 6142M Processor (2.60 GHz, 16C/32T, 22MB, TDP 150W),
  - Xeon Platinum 8160M Processor (2.10 GHz, 24C/48T, 33MB, TDP 150W),
  - Xeon Platinum 8170M Processor (2.10 GHz, 26C/52T, 35.75MB, TDP 165W),
  - Xeon Platinum 8176M Processor (2.10 GHz, 28C/56T, 38.50MB, TDP 165W),
  - Xeon Platinum 8180M Processor (2.50 GHz, 28C/56T, 38.50MB, TDP 205W)
- Turbo Boost Technology feature \*1
  - Hyper Threading Technology feature \*1
  - Intel AVX-512 Extended Instruction Set \*2
  - Intel Ultra Path Interconnect (UPI) \*3
  - Intel Run Sure Technology \*4
  - High-speed memory access (DDR4 2133/2400/2666 supported) \*5
  - High-speed disk access (SATA 6Gb/s, SAS 12Gb/s supported)
  - High-speed 10GBASE-SFP+ / 10GBASE-T / 1000BASE-T/100BASE-TX / 10BASE-T interface (10Gbps / 1Gbps / 100Mbps / 10Mbps supported) can be selected

### High reliability

- Processor throttle-ring feature
- Memory monitoring feature (error correction/error detection)
- Memory x4 SDDC feature
- Memory mirroring, memory sparing features
- Bus parity error detection
- Temperature detection
- Error detection
- Internal fan monitoring feature
- Internal voltage monitoring feature
- Power redundant feature (hot swapping supported)
- RAID system (Disk Array) (An option card is required.)
- Auto rebuild feature (hot swapping supported)
- System utility password feature
- The security lock that comes with Front Bezel
- Redundant fan configuration
- Fan (hot swapping supported)
- HDD (hot swapping supported)

**Management Utilities**

- NEC ESMPRO
- Remote controlling feature (iLO5)
- RAID system management utility (Smart Storage Administrator)
- Hard disk drive monitoring
- Power supply monitoring

**Power saving and noiseless design**

- Selection of power unit appropriate to environment, work load, and configuration
- Power consumption monitoring feature
- Power control feature
- 80 PLUS® Platinum / Titanium certified high efficiency power supply \*7
- Fan control appropriate to environment, work load, and configuration
- Silent sound design
- Enhanced Intel SpeedStep® Technology supported

**Expandability**

- Various option slots
  - PCI Express 3.0 (x16 lanes): 5 slot (Full height) \*9
  - PCI Express 3.0 (x8 lanes): 8 slots (Full height) \*10
  - PCI Express 3.0 (x8 lanes): 1 slot (dedicated to RAID controller)
  - PCI Express 3.0 (x8 lanes): 1 slot (dedicated to LOM card)
- Large capacity memory of up to 3.0TB \*6
- Can upgrade to multi-processor system with up to two processors
- Expansion Bay (for hard disk drives): up to 30 slots
- Optical disk drive bay provided as standard (8x 3.5-inch drive model)
- USB3.0 interface (Front: 1 port, rear: 2 ports, internal: 2 ports)
- USB2.0 interface (Front: 2 ports (option))
- Management LAN port (1 port)
- With optional LOM card, two to four LAN ports can be added.

**Ready to use**

- No cable connection is required to install a hard disk drive, additional power supply unit, and redundant fan unit (hot swap supported).
- Slide rails for each installation

**Many built-in Features**

- Redundant power supply system supported (valid when optional power supply unit is installed)
- Software power-off
- Remote power-on feature
- AC-Link feature
- Remote console feature

- Connector for display unit provided on rear panel
- Supports Redfish® API and incorporates baseboard management controller (iLO 5) which conforms to IPMI v2.0

### Self-diagnosis

- Power On Self-Test (POST)

### Easy setup

- EXPRESSBUILDER (setup utility)
- System utility

- \*1: The Intel Xeon processor Bronze 3100 series is not supported.
- \*2: The device that mounts Intel Xeon processor Bronze 3100 series/Silver 4100 series/Gold 5100 series executes one instruction simultaneously. The device that mounts Gold 6100 series/Platinum 8100 series executes two instructions simultaneously.
- \*3: The device that mounts Intel Xeon processor Bronze 3100 series/Silver 4100 series/Gold 5100 series is 2-UPI. The device that mounts Gold 6100 series/Platinum 8100 series is 3-UPI.
- \*4: The device that mounts Intel Xeon processor Bronze 3100 series/Silver 4100 series is not supported.
- \*5: Operating frequency can vary depending on the type or the number of boards of processor or memory installed.
- \*6: For 2 CPU configuration. Up to 1.5TB for 1 CPU configuration

Maximum available memory capacity depends on the type of processor, see below.

CPU	Maximum memory capacity per CPU
"Processor containing an "M" in the model Xeon ® Platinum 8160M, 8170M, 8176M, 8180M Xeon ® Gold 6134M, 6140M, 6142M"	1.5TB
others	768GB

- \*7: Power supply unit N8181-161 acquired 80 PLUS® Titanium.  
Power supply units N8181-159/160/162 acquired 80 PLUS®Platinum.
- \*8: When 2 rear-side N8154-98 2 x 2.5-inch additional HDD cage bays and N8154-95 2 x 2.5-inch additional HDD cage bays are installed in the 24 x 2.5-inch hard disk drive model (24 slots in standard configuration).
- \*9: When an optional riser card is installed with PCI Express 3.0: 2 slot (x16 lanes) for the primary riser, PCI Express 3.0: 2 slot (x16 lane) for the secondary riser, and PCI Express 3.0: 1 slot (x16 lane) for the tertiary riser.
- \*10: When an optional riser card is installed with PCI Express 3.0: 3 slot (x8 lanes) for the primary riser, PCI Express 3.0: 3 slot (x8 lane) for the secondary riser, and PCI Express 3.0: 2 slot (x8 lane) for the tertiary riser.
- \*11: These CPUs will not be supported and shipped to Taiwan clients.

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## 4. Names and Functions of Parts

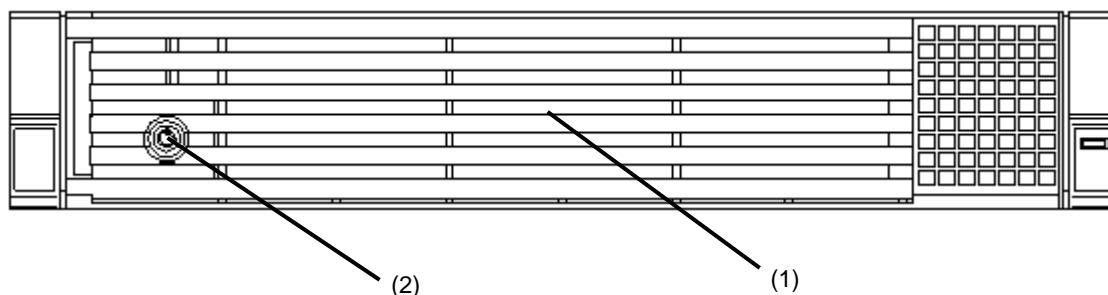
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This section describes the names of the server parts.

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### 4.1 Front View (With Front Bezel)

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**(1) Front Bezel**

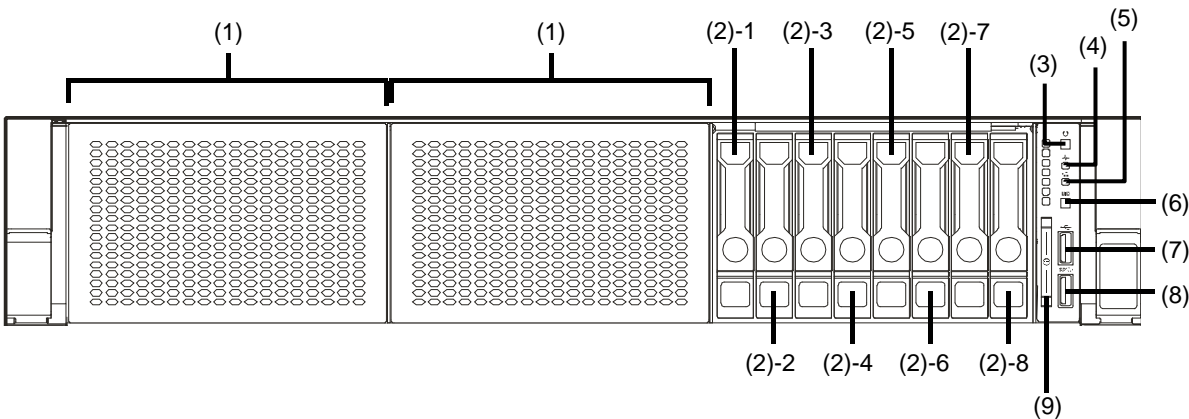
A cover for protecting the front of the server. This cover can be locked with the provided Bezel Lock Key.

**(2) Key Slot**

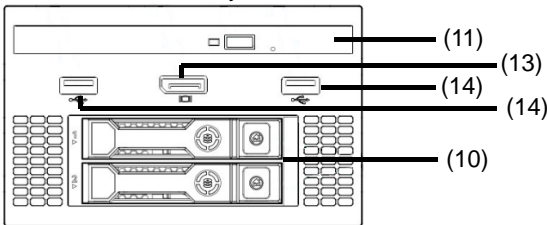
A slot for Bezel Lock Key that is used to lock Front Bezel.

## 4.2 Front View (Without Front Bezel)

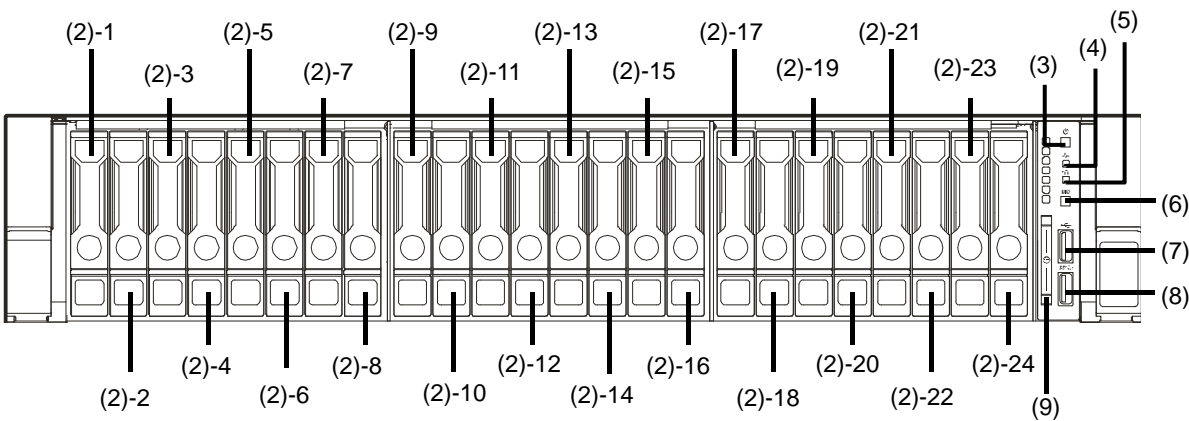
• 8 x 2.5-inch drive model



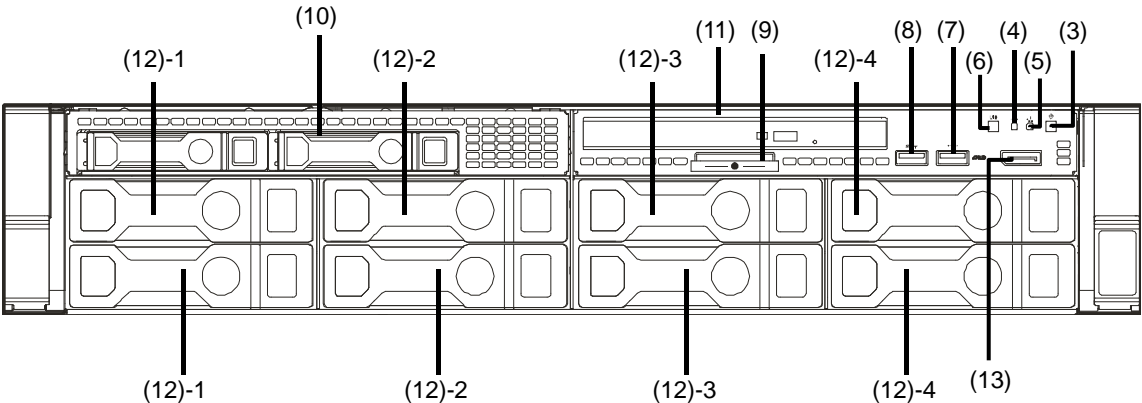
• Universal media bay



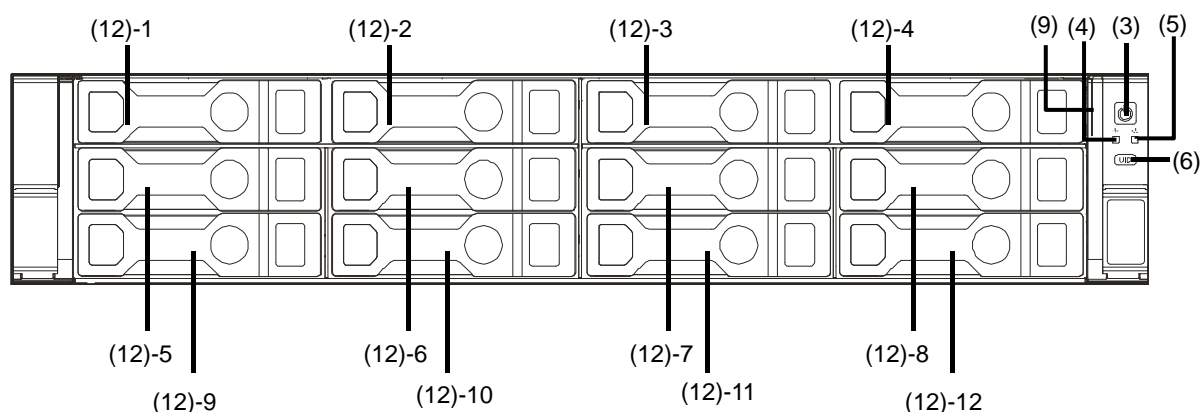
• 24 x 2.5-inch drive model



• 8 x 3.5-inch drive model



## • 12 x 3.5-inch drive model

**(1) Expansion Bay**

Used for installing the optional hard disk drive, universal media bay

**(2) 2.5-inch Hard Disk Drive Bay**

Bays for installing HDDs. The sequential numbers indicate the corresponding bay numbers. All bays include Dummy Trays.

**(3) POWER Switch/LED**

A switch for turning on/off the server. Press once to turn on the server. POWER LED lights when it is on. Press it again to turn off the server. Hold down the switch for four seconds or more to forcibly turn off the server.

**(4) STATUS LED**

LEDs for showing the server status

**(5) LAN LINK/ACT LED**

LEDs for showing the status of accessing to the network.

**(6) UID (unit ID) switch/LED**

The switch to turn ON/OFF unit ID LED or restart iLO. When pressed once, the UID LED lights up, and it turns ON. Press it again to turn it OFF.

For instructions on restarting iLO using the UID switch, see iLO 5 User's Guide.

During executing commands from software, remote management of iLO or firmware update, the UID LED lights up or flashes if iLO is restarted via UID switch

**(7) iLO service port USB connector**

A USB connector used for connecting to iLO such as for acquiring log. For details, refer to *iLO 5 User's Guide*.

**(8) USB3.0 connector (front)**

Connectors for connecting USB 3.0 interface devices.

**(9) Pull-out Tab**

A tab for showing the model number and serial number of the server

**(10) 2.5-inch Expansion Bay (option)**

Used for installing 2 x 2.5-inch expansion modules (optional).

**(11) Optical disk drive (option)**

Attaching the optical disk drive.

According to the order at the time of buying, one of the following option drives is installed.

- DVD-ROM drive
- DVD Super MULTI drive

**(12) 3.5-inch Hard Disk Drive Bay**

Bays for installing HDDs. The sequential numbers indicate the corresponding bay numbers. All bays include Dummy Trays.

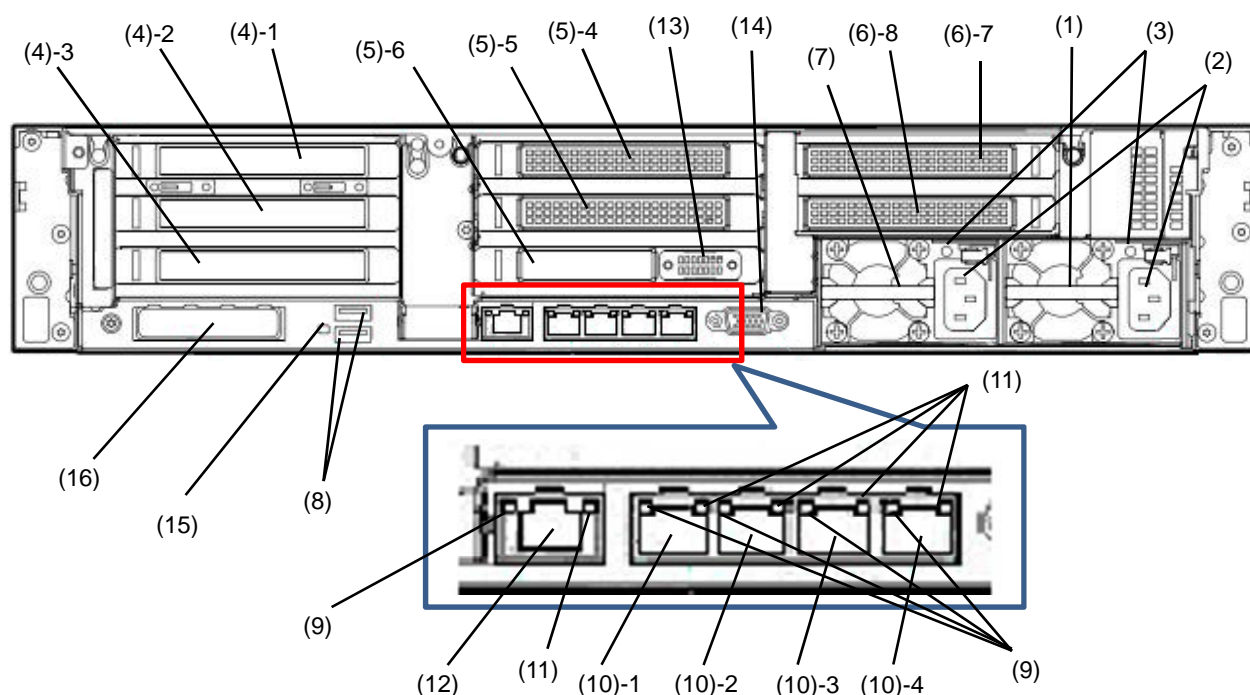
**(13) Display Port Connector (Optional)**

Not support

**(14) USB 2.0 connector (optional)**

Connectors for connecting USB 2.0 interface devices.

## 4.3 Rear View



**(1) Power Unit (Power supply slot 1)**  
(Required option) A power supply for supplying the DC power to the server.

**(2) AC Inlet**  
A socket for connecting the power cord.

**(3) AC POWER LED**  
An LED for showing the power supply status. (See page 43)

**(4) Primary Riser Slot**  
Slots for installing full-height PCI cards. The numbers following the numbers in parentheses indicate PCI slot numbers.

**(5) Secondary Riser Slot**  
Slots for installing full-height PCI cards. The numbers following the numbers in parentheses indicate PCI slot numbers. \*1

**(6) Tertiary Riser Slot**  
Slots for installing full-height PCI cards. The numbers following the numbers in parentheses indicate PCI slot numbers. \*1

**(7) Power supply unit 2 (power supply slot 2) (Selection option)** The second power supply unit.  
It can be redundant if the second unit is arranged.

**(8) USB 3.0 Connectors**  
Connectors for connecting USB 3.0 interface devices

**(9) LINK LED**  
LEDs for showing the status of LAN. (See page 43)

**(10) LAN connectors \*1**  
Connectors for connecting to a network (1000BASE-T/100BASE-TX/10BASE-T).  
(10)-1: LAN1 connector  
(10)-2: LAN2 connector  
(10)-3: LAN3 connector  
(10)-4: LAN4 connector

**(11) ACT LED**  
LEDs for showing the transfer speed of LAN ports. (See page 43)

**(12) Management LAN Connector**  
A LAN connector which supports 1000BASE-T/100BASE-TX/10BASE-T.  
Incompatible as LANs for regular OS.

**(13) Serial Port Connector (optional)**  
A connector for connecting serial interface devices.  
This cannot directly connect to a network line.

**(14) Display Connector**  
A connector for connecting a display.

**(15) UID (unit ID) LED**  
Turning ON/OFF the unit ID LED on the front side, it lights up/lights off. It interlocks with the front UID LED. During executing commands from software, remote management of iLO or firmware update, the UID LED lights up or flashes if iLO is restarted via UID switch.

**(16) LOM Card Slot**  
A PCIe slot bay dedicated to an additional LAN card (optional) that can be directly connected to the motherboard.

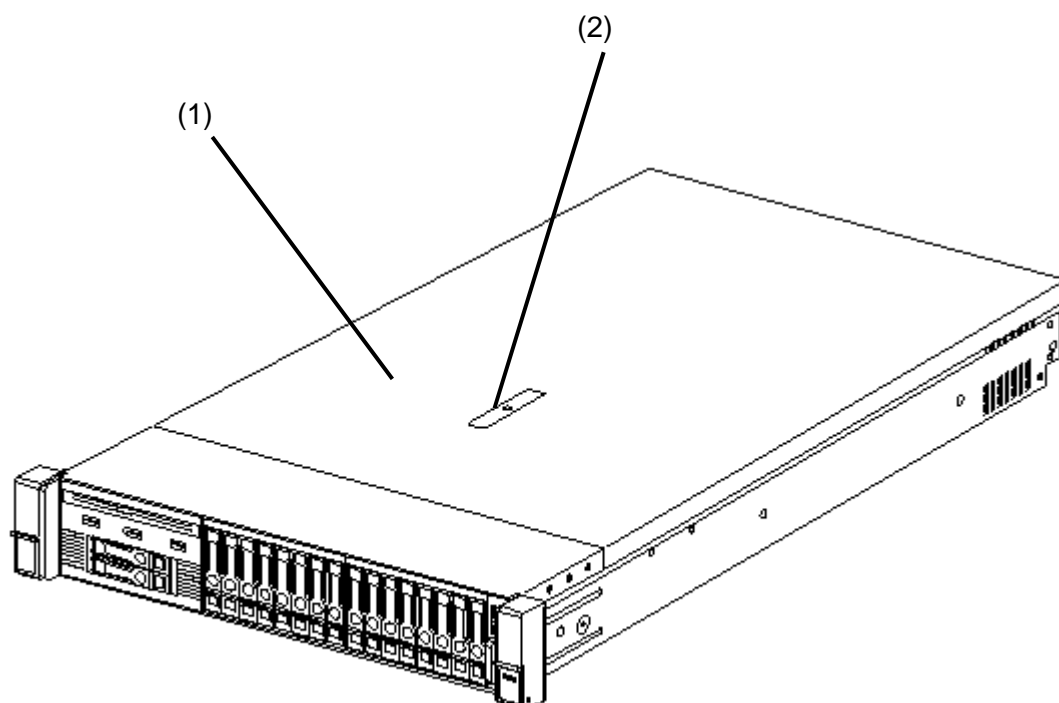
\*1: Secondary/Tertiary Riser are an option which needs the second processor before the installation.



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## 4.4 External View

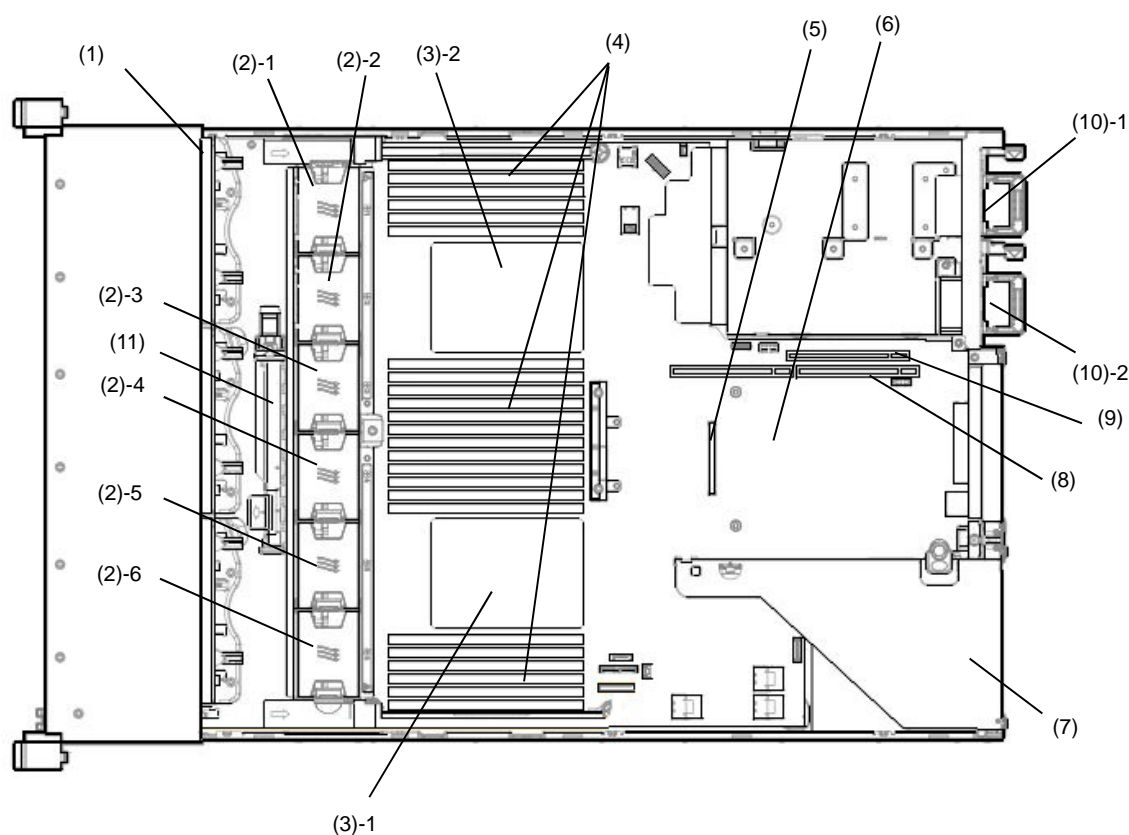
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- (1) Top cover
- (2) Hood latch

## 4.5 Internal View

The diagram omits the air duct.



**(1) Backplane**

**(2) Cooling Fan**

- 1 FAN1 (option)
- 2 FAN2 (option)
- 3 FAN3
- 4 FAN4
- 5 FAN5
- 6 FAN6

FAN3 to FAN6 are factory installed. FAN 1 and 2 are required in 2-CPU configuration.

**(3) Processor (CPU, installed under the heat sink)**

- 1 CPU1 (required option)
- 2 CPU2 (option)

**(4) DIMM (option)**

**(5) Slot for RAID Controller**

**(6) Motherboard**

**(7) Primary Riser Card**

Standard riser is standard-installed  
Changeable by option

**(8) Secondary Riser Card connector**

Riser card/cage are optional.

**(9) Tertiary Riser Card connector**

Riser card/cage are optional.

**(10) Power Supply Unit**

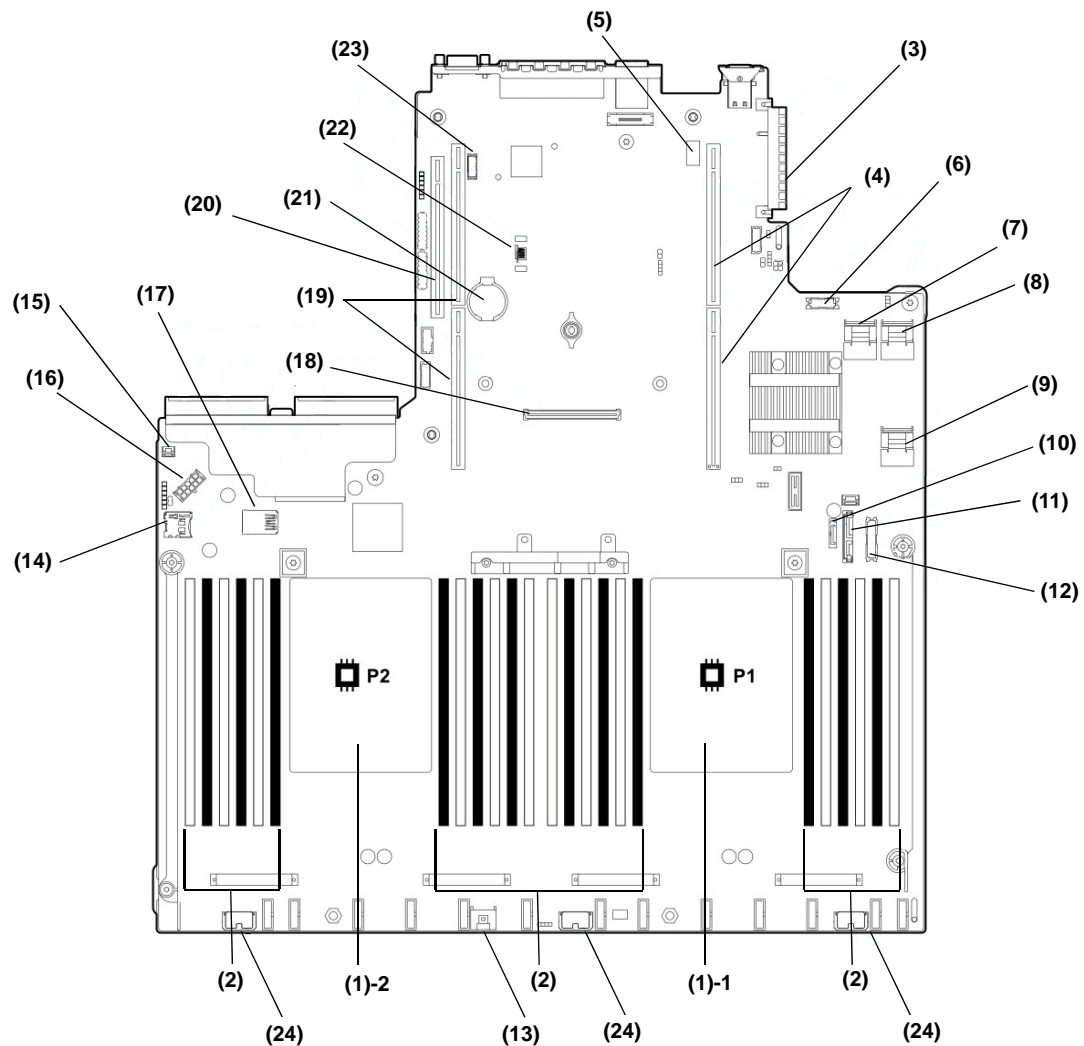
The numbers after the parenthesized numbers indicate slot numbers.

- 1 PSU1 (required option)
- 2 PSU2 (optional)

**(11) Battery for RAID controller**

(Lithium ion battery)

## 4.6 Motherboard



- |  |  |
|--|--|
| <p>(1) Processor (CPU) Socket<br/>-1 Processor #1 (CPU #1)<br/>-2 Processor #2 (CPU #2)</p> <p>(2) DIMM slot</p> <p>(3) LAN Mezzanine Card Connector</p> <p>(4) Connector for primary Riser Card</p> <p>(5) System maintenance switch</p> <p>(6) Front display/USB 2.0 connector</p> <p>(7) X4 SATA Port 1 connector</p> <p>(8) x4 SATA Port 2 connector</p> <p>(9) x2 SATA Port 3 connector</p> <p>(10) x1 SATA Port 4 connector</p> <p>(11) SATA Port 5 connector for optical disk drive</p> | <p>(12) Power supply SW/USB 3.0 connector</p> <p>(13) Battery connector for RAID controller</p> <p>(14) Power Connector for Expander Board</p> <p>(15) Power Connector for Expander Board</p> <p>(16) Power connector for HDD BP</p> <p>(17) Internal x 2 USB 3.0 connector</p> <p>(18) Connector dedicated to RAID controller (Type-a)</p> <p>(19) Connector for secondary Riser Card<br/>CPU2 is required for using the secondary riser card.</p> <p>(20) Connector for tertiary Riser Card<br/>CPU2 is required for using the tertiary riser card.</p> <p>(21) Lithium Battery</p> <p>(22) Connector for Option TPM Kit</p> <p>(23) Connector for Option COM</p> <p>(24) Drive BP Power Connector</p> |
|--|--|

### 4.6.1 System Maintenance Switch

Position	Default	Setting	Description
SW1 *1,*5	Off	Off	Set to OFF at regular times.
		On	Sets the security of iLO5 to disabled.
SW2	Off	Reserved	-
SW3	Off	Reserved	-
SW4	Off	Reserved	-
SW5 *2,*5	Off	Off	Set to OFF at regular times.
		On	Clear power-on password and administrator password.
SW6 *3,*5	Off	Off	Set to OFF at regular times.
		On	Set the system configuration back to the default values. *4
SW7	Off	Reserved	-
SW8	Off	Reserved	-
SW9	Off	Reserved	-
SW10	Off	Reserved	-
SW11	Off	Reserved	-
SW12	Off	Reserved	-

**Important** Do not change the system maintenance switch that says “Reserved” unless it is instructed by the document. It may cause the trouble or malfunction of the device.

\*1 Set the SW1 to ON when all the passwords of iLO5 to which administrator authority is given have become unknown or when enabling the iLO5 features.

\*2 Regarding the operation procedure of SW5, see *Chapter 1 (7.3.4 Clearing a Password)* in the *Maintenance Guide*.

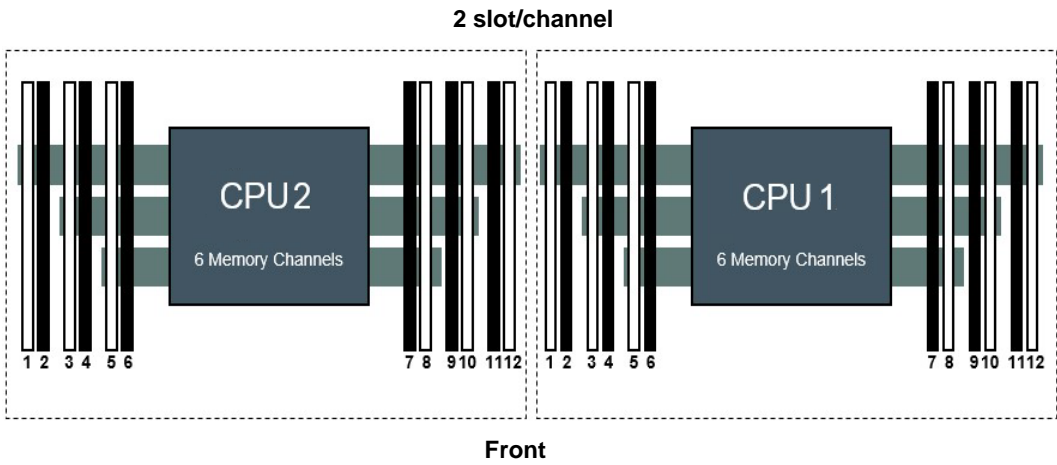
\*3 Regarding the operation procedure of SW6, see *Chapter 3 (7.3.3 Set the System Configuration Back to the Default Value)* in the *Maintenance Guide*.

\*4 Default values may be different from the factory presets.

\*5 When you set SW1, SW5, and SW6 to ON at the same time, boot with the backup ROM.

4.6.2 DIMM slot

DIMM slots are numbered in order 1 to 12 for the processor.

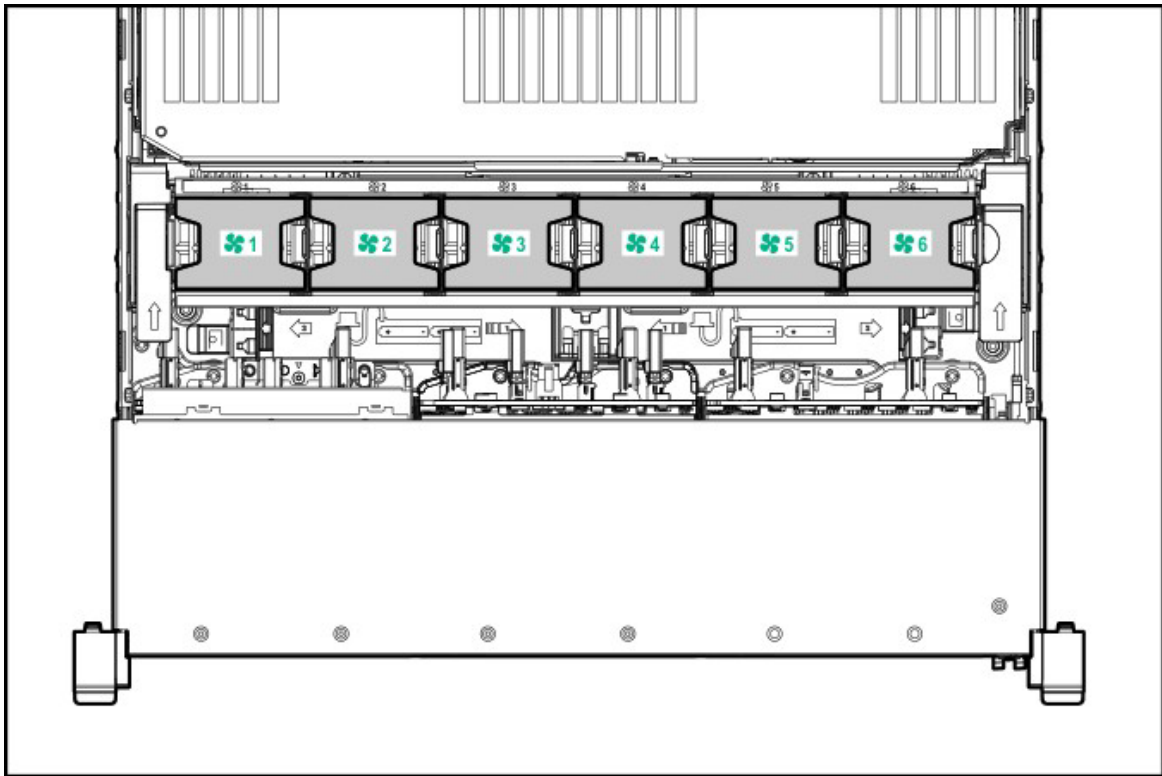


4.7    Cooling Fan Option

- Important

To prevent damage to server components, make sure to install fan covers on fan bays 1 and 2 for single processor configurations.
- Important

To prevent damage to the device, do not let the server operate for extended lengths of time without the appropriate number of fans installed. The server may start, but it is not recommended to let is operate without the necessary fans installed and running.



The following displays the structure for installing cooling fans.

Configuration	Fan bay 1	Fan bay 2	Fan bay 3	Fan bay 4	Fan bay 5	Fan bay 6
1xCPU	Blank cover	Blank cover	Fan	Fan	Fan	Fan
2xCPU	Fan	Fan	Fan	Fan	Fan	Fan
Containing CPU x 1 and 2.5 inch drive x 24 or 3.5 inch drive x 12. Employing a powerful fan	Fan	Fan	Fan	Fan	Fan	Fan

For single processor configurations except for 24x2.5-inch and 12x3.5-inch configurations, a particular cooling fan bay requires four fans and two blank covers for redundancy. If the cooling fan fails or lacks, the redundancy will fail. The server shuts down in the normal way when the second cooling fan fails or falls short.

6 fans are needed to enable redundancy for dual processor configuration or 24 x 2.5-inch or 12 x 3.5-inch single processor configuration. If a fan fails or is missing, redundancy will be disabled. If the second fan fails or is missing, the server will shut down through the normal process.

A high-performance fan is required for the configuration of 24 x 2.5 inch drive model or 12x 3.5 inch drive model. In addition, it may required for the following installation.

- Optional GPU Riser Card

The device supports the change of the revolving speed of fan. Until a temperature rises and the server needs to be cooled down by accelerating the revolving speed of fan, the fan revolves at the minimum speed. The server shuts down in the following situations relating to temperature.

- In case a temperature at a cautious level is detected, iLO5 executes the shutdown of OS safely. In case a temperature at a critical level is detected, iLO5 executes not a shutdown but a hard shutdown of OS.
- With "Thermal Shutdown" function set to "Disabled" at "BIOS/Platform Configuration (RBSU)", in case a temperature at a cautious level is detected, the shut down of OS is not executed and the operation continues, but in case a temperature at a critical level is detected, a hard shutdown is executed.

Important

If “Thermal Shutdown“ feature is set to “Disabled” in “BIOS/Platform Configuration (RBSU),” Server Component may be damaged by a high temperature event.

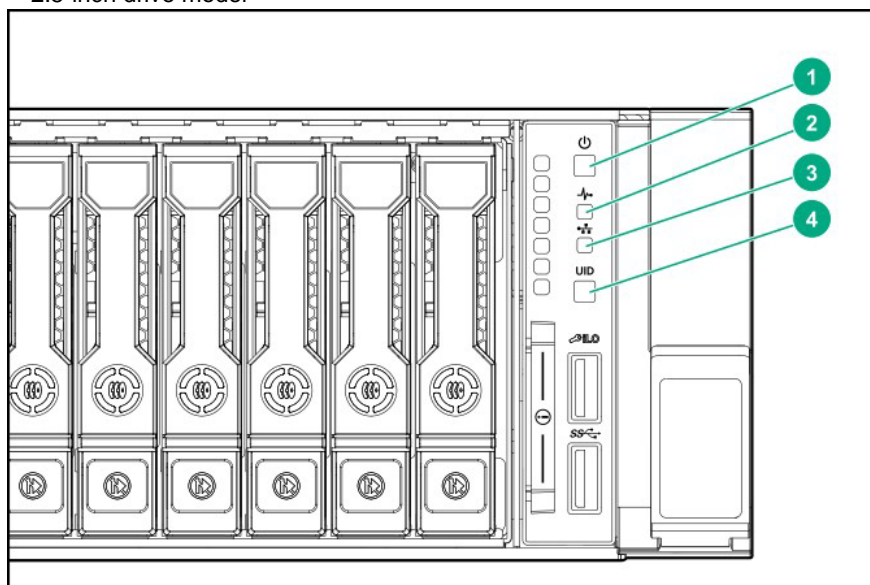
Tips

In case NEC ESMPRO ServerAgentService is installed, since a shut down due to high temperature is executed by NEC ESMPRO ServerAgentService, you need to set “Thermal Shutdown” to “Disabled.”

## 4.8 Status Indicators

### 4.8.1 LEDs on the front side of the unit

• 2.5-inch drive model



No.	Item	Status	Description
1	Power switch and system power LED <sup>*1</sup>	Lights in green	The system is powered on
		Flashes in green (once per second)	The power on sequence in progress
		Lights in amber	The system is in standby state
		Lights off	Power is not supplied <sup>*2</sup>
2	Status LED <sup>*1</sup>	Lights in green	Normal state
		Flashes in green (once per second)	Restarting iLO
		Flashes in amber	The function of the system is deteriorating
		Flashes in red (once per second)	The system is in a critical state <sup>*3</sup>
3	LINK/ACT LED <sup>*1</sup>	Lights in green	Linked to the network
		Flashes in green (once per second)	The network is working
		Lights off	The network is not working
4	UID switch/LED <sup>*1</sup>	Lights in blue	Working in operation
		Flashes in blue (once per second)	Remote management or firmware upgrade is in progress
		Flashes in blue (4 times per second)	The iLO restart sequence using the UID switch has been launched
		Flashes in blue (8 times per second)	The iLO restart sequence using UID switch is in progress
		Lights off	Not working

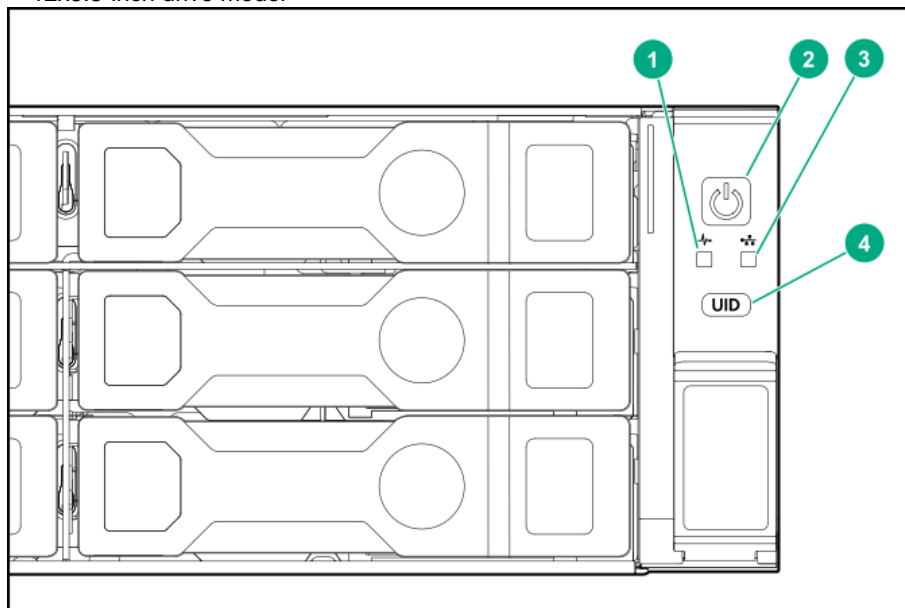
<sup>\*1</sup> If all the four LEDs described in this table is flashing at the same time, it indicates that a power failure has occurred. For details, refer to (2) *Power failure LED*.

<sup>\*2</sup> The power is not supplied, the power cord is not connected, the power supply unit is not installed, the power supply unit is defect, or the power cord is disconnected.



- \*3 If the STATUS LED indicates a degraded or critical condition, check the system IML or use iLO to check the system status.

• 12x3.5-inch drive model



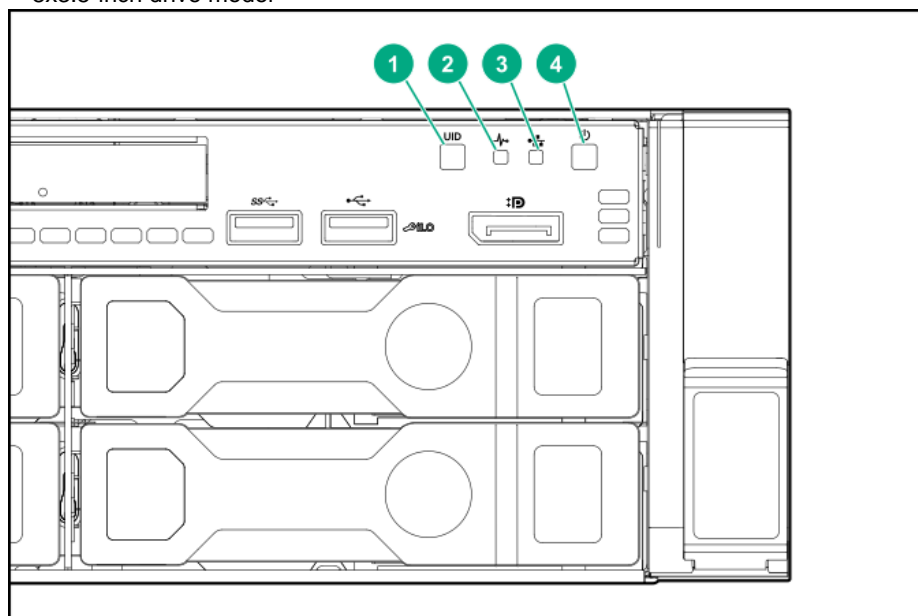
No.	Item	Status	Description
1	STATUS LED*1	Lights in green	Normal state
		Flashes in green (once per second)	Restarting iLO
		Flashes in amber	The function of the system is deteriorating
		Flashes in red (once per second)	The system is in a critical state *3
2	POWER Switch/LED*1	Lights in green	The system is powered on
		Flashes in green (once per second)	The power on sequence in progress
		Lights in amber	The system is in standby state
		Lights off	Power is not supplied*2
3	LINK/ACT LED*1	Lights in green	Linked to the network
		Flashes in green (once per second)	The network is working
		Lights off	The network is not working
4	UID Switch/LED*1	Lights in blue	Working in operation
		Flashes in blue (once per second)	Remote management or firmware upgrade is in progress
		Flashes in blue (4 times per second)	The iLO restart sequence using the UID switch has been launched
		Flashes in blue (8 times per second)	The iLO restart sequence using UID switch is in progress
		Lights off	Not working

\*1 If all the four LEDs described in this table is flashing at the same time, it indicates that a power failure has occurred. For details, refer to (2) *Power failure LED*.

\*2 The power is not supplied, the power cord is not connected, the power supply unit is not installed, the power supply unit is defect, or the power cord is disconnected.

\*3 If the STATUS LED indicates a degraded or critical condition, check the system IML or use iLO to check the system status.

• 8x3.5-inch drive model



No.	Item	Status	Description
1	UID switch/LED <sup>*1</sup>	Lights in blue	Working in operation
		Flashes in blue (once per second)	Remote management or firmware upgrade is in progress
		Flashes in blue (4 times per second)	The iLO restart sequence using the UID switch has been launched
		Flashes in blue (8 times per second)	The iLO restart sequence using UID switch is in progress
		Lights off	Not working
2	STATUS LED <sup>*1</sup>	Lights in green	Normal state
		Flashes in green (once per second)	Restarting iLO
		Flashes in amber	The function of the system is deteriorating
		Flashes in red (once per second)	The system is in a critical state <sup>*3</sup>
3	LINK/ACT LED <sup>*1</sup>	Lights in green	Linked to the network
		Flashes in green (once per second)	The network is working
		Lights off	The network is not working
4	POWER Switch/LED <sup>*1</sup>	Lights in green	The system is powered on
		Flashes in green (once per second)	The power on sequence in progress
		Lights in amber	The system is in standby state
		Lights off	Power is not supplied <sup>*2</sup>

<sup>\*1</sup> If all the four LEDs described in this table is flashing at the same time, it indicates that a power failure has occurred. For details, refer to (2) *Power failure LED*.

<sup>\*2</sup> The power is not supplied, the power cord is not connected, the power supply unit is not installed, the power supply unit is defect, or the power cord is disconnected.

<sup>\*3</sup> If the STATUS LED indicates a degraded or critical condition, check the system IML or use iLO to check the system status.

### (1) UID switch function

When the server does not turn on, the UID switch can be used to display Server Health Summary.

### (2) Power failure LED

The following table shows a list on power failure LEDs and affected subsystems. Not all power failures are applied on all servers

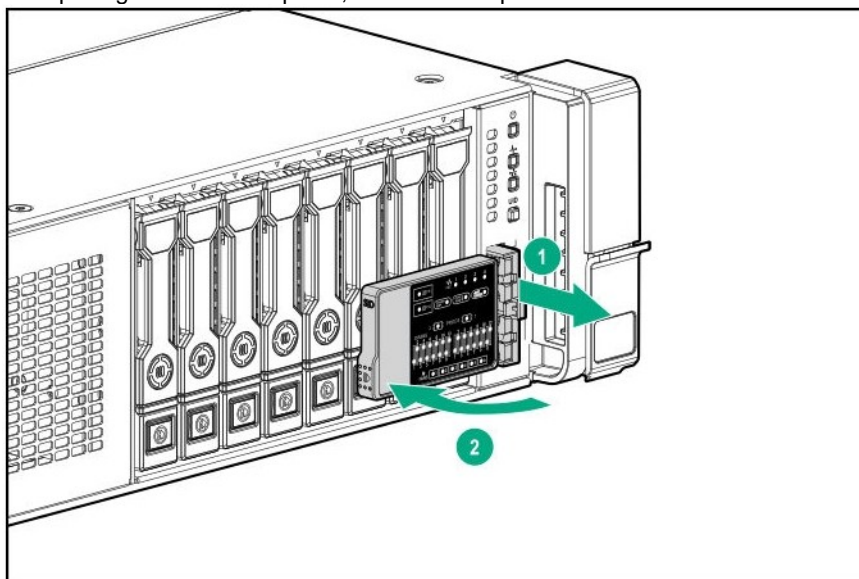
Subsystem	LED status
Motherboard	Flashes once
Processor	Flashes twice
Memory	Flashes 3 times
Riser card board PCIe slot	Flashes 4 times
LOM card	Flashes 5 times
RAID controller/SAScontroller	Flashes 6 times
Motherboard PCIe slot	Flashes 7 times
Power backplane or storage backplane	Flashes 8 times
Power Supply Unit	Flashes 9 times

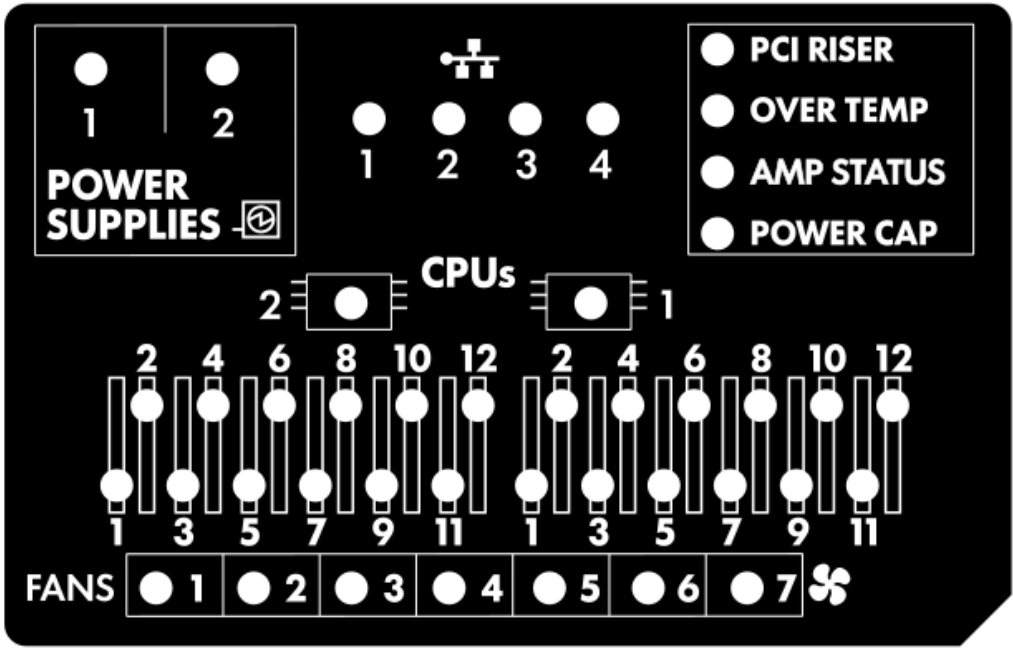
### (3) Status LED Panel (Systems Insight Display)

The Status LED Panel represents the layout of the parts on the motherboard. From these LED indicators, you can diagnose suspected parts while the top cover is attached.

#### Procedure

1. Push the panel and then pull it out.
2. After pulling out the entire panel, turn back the panel to see the status of LED.





Item	Status	Description
Processor LED	Lights off	Normal state
	Amber	Processor has failed
DIMM LED	Lights off	Normal state
	Amber	The DIMM has failed or there is a configuration problem
Cooling fan LED	Lights off	Normal state
	Amber	The cooling fan has failed or is not recognized
NIC LED	Lights off	Not linked to the network. If the NIC LED is off, check the status with LED on the backside of the unit.
	Lights in green	Linked to the network
	Flashes in green	Linked to the network and working in operation
Power unit LED	Lights off	Normal state
	Lights in amber	The power subsystem is degraded, the power supply unit has failed, or the input power is disconnected
Riser Card LED	Lights off	Normal state
	Amber	Riser card unit is not correctly installed
Overtemperature LED	Lights off	Normal state
	Amber	High temperature detected
AMP status LED	Lights off	AMP mode disabled
	Lights in green	AMP mode enabled
	Lights in amber	Failover
	Flashes in amber	Invalid configuration
Power Capping LED	Lights off	The system is in standby state, or the upper limit of power consumption is not set
	Lights in green	The upper limit of power consumption is applied

When the STATUS LED on the front panel lights in amber or red, it indicates that an event has occurred on the server. For details, refer to (4) *Status LED Panel combined LED descriptions* in the next section.

#### (4) Status LED Panel combined LED descriptions

The combined illumination of the following LEDs indicates a system condition:

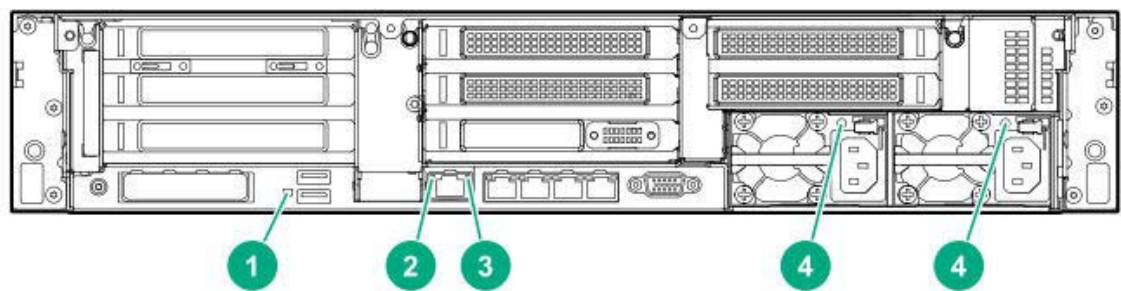
- Systems Insight Display LEDs
- System power LED
- Health LED

Status LED Panel LED		Status LED	System power LED	Description
Processor LED	Amber	Red	Amber	One or more of the following conditions may be occurring. <ul style="list-style-type: none"> <li>· Processor in socket X has failed.</li> <li>· Processor X is not installed in the socket.</li> <li>· Processor X is not supported.</li> <li>· During POST execution, the ROM detected a failed processor.</li> </ul>
	Amber	Amber	Green	The processor in socket X is in the predicted failure state.
DIMM LED	Amber	Red	Green	One or more DIMM(s) have failed.
	Amber	Amber	Green	The DIMM in slot X is in predicted failure state.
Overtemperature LED	Amber	Amber	Green	Health driver has detected warning temperature.
	Amber	Red	Amber	The server has detected a fault on hardware temperature.
Riser Card LED	Amber	Red	Green	The riser card unit is not properly installed.
Cooling Fan LED	Amber	Amber	Green	One cooling fan has failed or has been removed.
	Amber	Red	Green	Two or more cooling fans have failed or have been removed
Power Supply Unite LED	Amber	Red	Amber	One or more of the following conditions may be occurring. <ul style="list-style-type: none"> <li>· Only one power supply unit is installed and is in the standby state.</li> <li>· Power supply failure</li> <li>· System board failure</li> </ul>
	Amber	Amber	Green	One or more of the following conditions may be occurring. <ul style="list-style-type: none"> <li>· While redundant power supplies are installed, the only one of them is functioning.</li> <li>· The AC power cord is not connected to the redundant power supply.</li> <li>· Failure on redundant power supply</li> <li>· Power supply does not match due to the detection of power supply mismatch during POST execution, or addition of a hot plug.</li> </ul>
Power Capping LED	Lights off	—	Amber	In standby state
	Green	—	Flashes in green	Waiting for power supply to be turned ON.
	Green	—	Green	Power is available.
	Flashes in amber	—	Amber	Power is not available.

#### Important

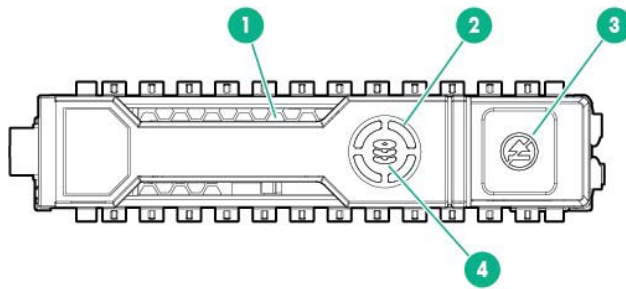
If the LED in multiple DIMM slots is lit, further troubleshooting is required. Remove all other DIMMs and test each bank of DIMMs. Replace each DIMM in the bank with a properly working DIMM to identify the faulty DIMM.

4.8.2 LEDs on the backside of the unit



No.	Item	Status	Description
1	UID LED	Lights in blue	Confirmation function is used.
		Flashes in blue	The system is remotely managed.
		Lights off	Confirmation function is not used.
2	LINK LED	Lights in green	Connected.
		Lights off	Not linked to the network.
3	ACT LED	Lights in green	Working in operation.
		Flashes in green	Working in operation.
		Lights off	Not working.
4 (left)	AC POWER2 LED	Lights in green	Normal state
		Lights off	One or more of the following situations are occurring <ul style="list-style-type: none"><li>· AC power is not supplied</li><li>· Power supply unit has failed</li><li>· Power supply unit is in standby mode</li><li>· Power supply unit exceeds the current limit</li></ul>
4 (right)	AC POWER1 LED	Lights in green	Normal state
		Lights off	One or more of the following situations are occurring <ul style="list-style-type: none"><li>· AC power is not supplied</li><li>· Power supply unit has failed</li><li>· Power supply unit is in standby mode</li><li>· Power supply unit exceeds the current limit</li></ul>

### 4.8.3 Hot plug compatible SATA/SAS drive LED



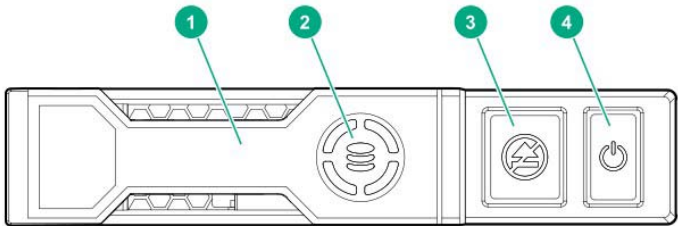
No.	Item	Status	Description
1	Position Check LED	Lights in blue	The drive is identified by the host application
		Flashes in blue	Firmware on the drive carrier is being updated or requires updating
2	DISK ACT LED	Rotates in green	Drive is working
		Lights off	Drive is not working
3	Remove Protect Switch/LED	Lights in white	Do not remove the drive. Removing a drive causes one or more logical drives to fail.
		Lights off	Even if the drive is removed, the logical drive will not fail.
4	DISK STATUS LED	Lights in green	A drive is a member of one or more logical drives.
		Flashes in green	Rebuilding the drive, migrating RAID on the drive, migrating or expanding the capacity of the strip size, expanding the capacity of the logical drive, or erasing the drive.
		Flashes in amber/green.	A drive is a member of one or more logical drives and a drive failure is predicted.
		Flashes in amber	Drive is not configured, and drive failure is predicted.
		Lights in amber	Drive has failed.
		Lights off	In the drive, the RAID controller has not achieved the configuration.

Important	Observe the following precautions whenever you use the auto rebuilding feature.
	• Do not turn off or reboot the server while a HDD is being rebuilt.
	• Wait for at least 90 seconds before installing a HDD after removing one.
	• Do not replace a HDD while another HDD is being rebuilt.



4.8.4 PCIe SSD drive LED

PCIe SSD is a PCIe bus device. Devices connected to the PCIe bus cannot be removed until the signals of device and bus and traffic flow are completely terminated.



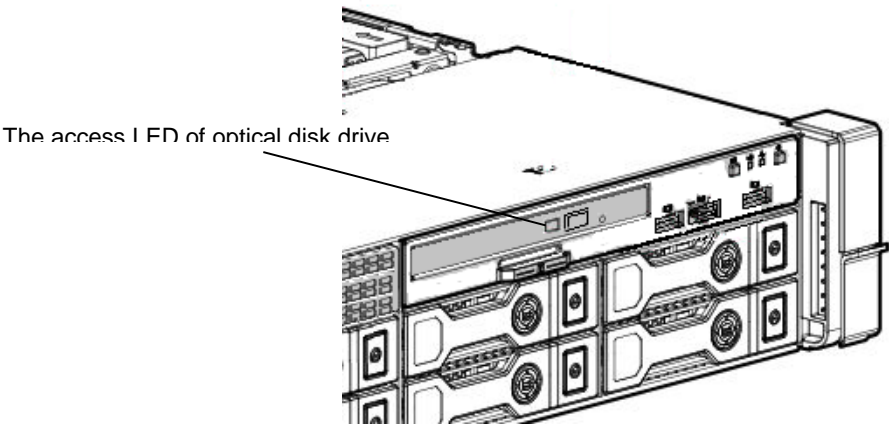
Important

Do not remove the PCIe SSD drive from the drive bay when the LED of removal prohibition is flashing. The flashing of the removal prohibition LED indicates that the device is still in use. Removing the PCIe SSD drive before completion of the device signal and traffic flow may result in data loss.

No.	Item	Status	Description
1	Release lever	—	—
		—	—
2	DISK ACT LED	Rotates in green	Drive is working
		Lights off	Drive is not working
3	Remove Protect Switch/LED	Lights in white	Do not remove the drive. Removing a drive causes one or more logical drives to fail.
		Flashes in white	Hot-plug processing
		Lights off	Even if the drive is removed, the logical drive will not fail.
4	Power switch	Lights in green	Singed in OS.
		Lights off	Unsigned in OS

4.8.5 Optical Disk Drive Access LED (optional)

The LED for optical disk drive at the front of the server flashes when a CD or DVD is being accessed.



4.9

Identification of Drive Boxes

4.9.1

Front BOX

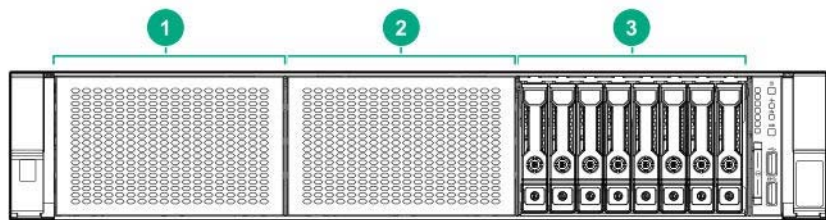


Chart number	BOX number
1	BOX1
2	BOX2
3	BOX3

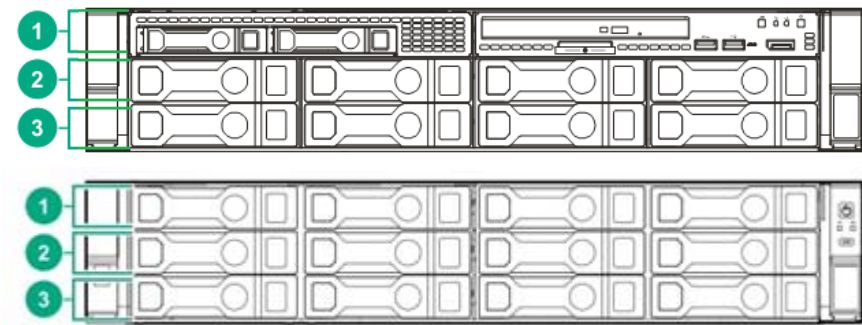


Chart number	BOX number
1	BOX1
2	BOX2
3	BOX3

4.9.2

Rear BOX

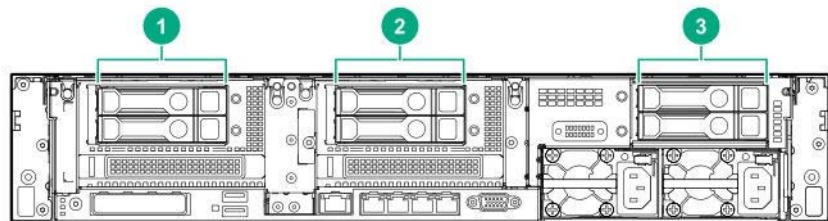


Chart number	BOX number
1	BOX4
2	BOX5
3	BOX6

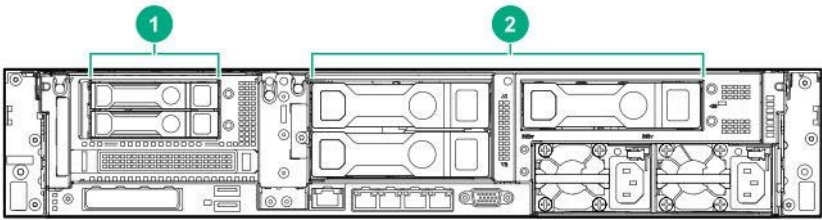


Chart number	BOX number
1	BOX4
2	BOX6

4.9.3 Mid BOX

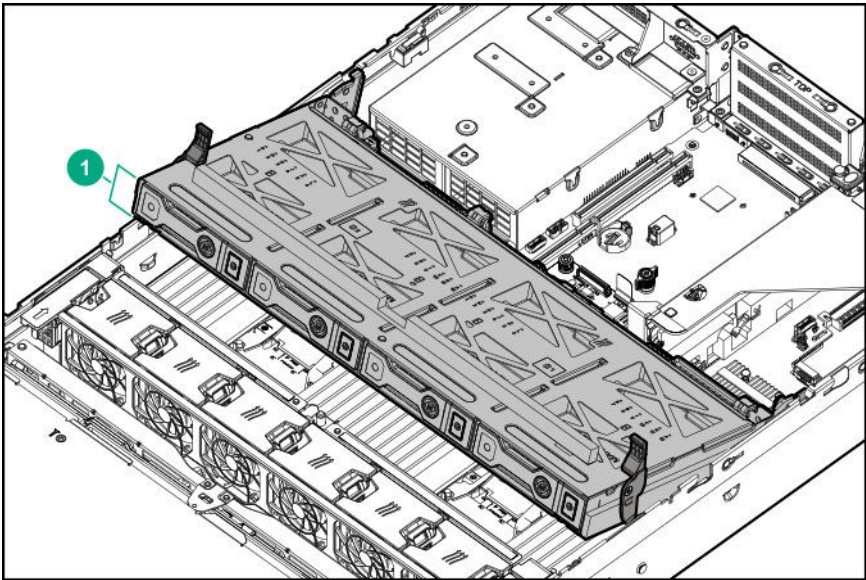


Chart number	BOX number
1	BOX7

## 4.10 Device Number

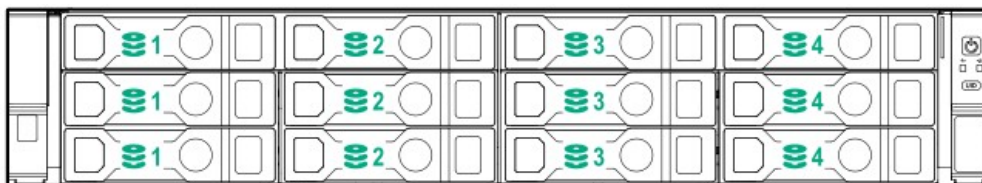
Drive bay numbers may differ according to the connection of a drive back plane and a controller.

- Controller
  - Connection to a on-board SATA port
  - Connection to a PCI board (AROC Type-a) to be installed on a dedicated connector for RAID controller
  - Connection to a RAID controller PCI board (Type-p) to be installed on riser card

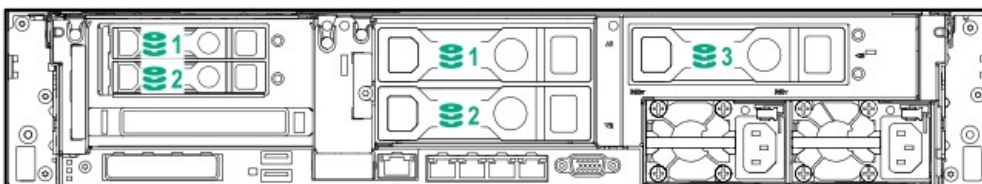
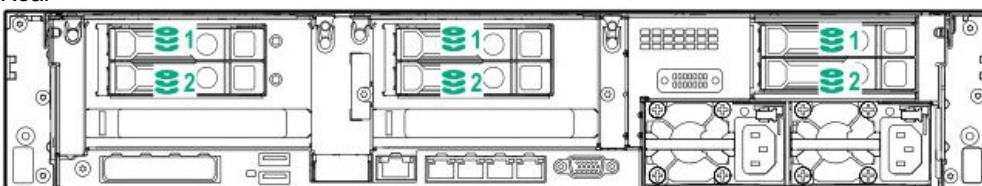
### 4.10.1 Drive bay numbers when a RAID controller is used

If the drive back plane is directly connected to the controller, the drive bay number starts from 1. Here we illustrate the examples.

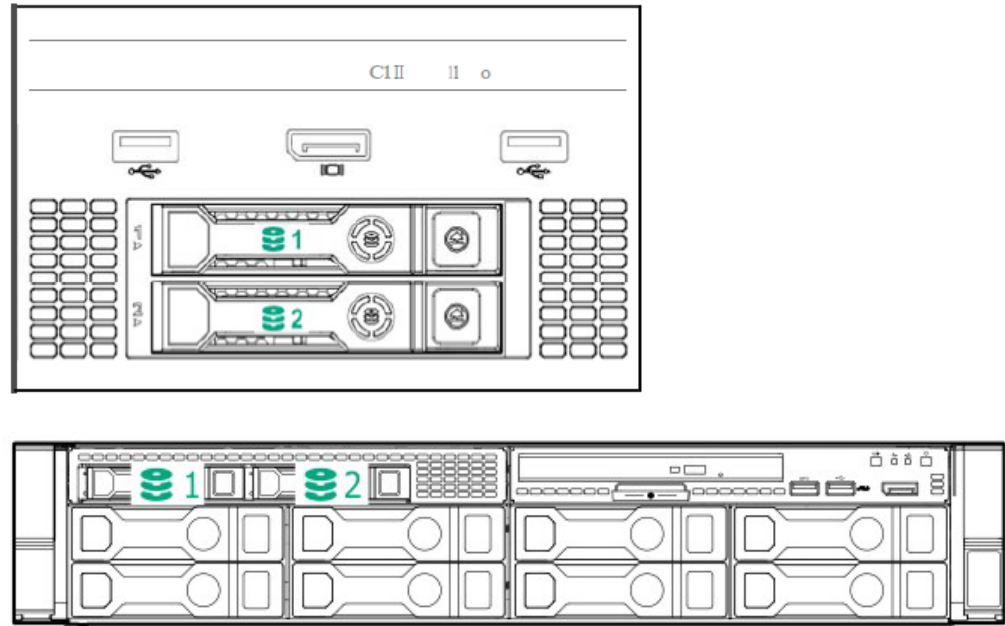
Front



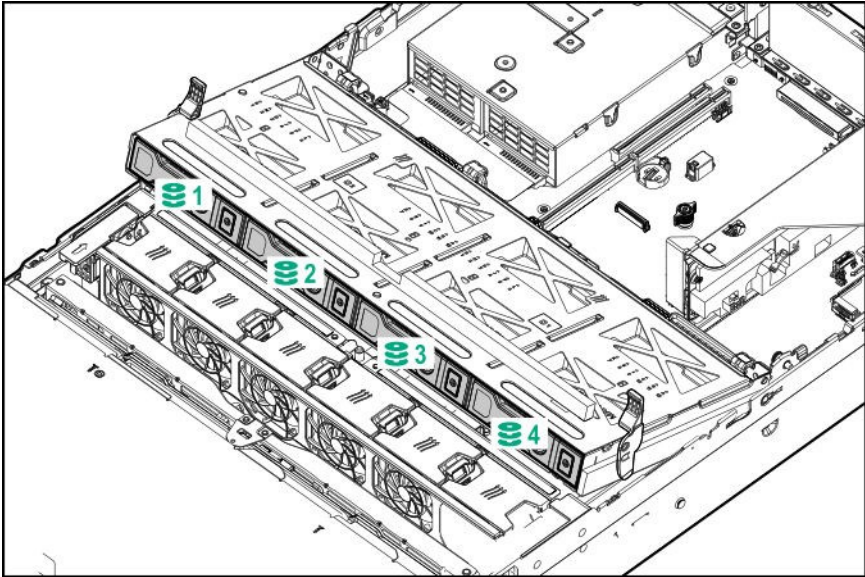
Rear



Front



Mid





### 4.10.2 Drive bay numbers when SAS expander is used

If you connect via an SAS Expander, the drive bay numbers become sequential.

- SAS Expander Port 1 is always connected to Port 1 of RAID Controller.
- SAS Expander Port 2 is always connected to Port 2 of RAID Controller.
- SAS Expander Port 3 connection = Drive bay number 1-4
- SAS Expander Port 4 connection = Drive bay number 5-8
- SAS Expander Port 5 connection = Drive bay number 9-12
- SAS Expander Port 6 connection = Drive bay number 13-16
- SAS Expander Port 7 connection = Drive bay number 17-20
- SAS Expander Port 8 connection = Drive bay number 21-24
- SAS Expander Port 9 connection = Drive bay number 25-28

Here we illustrate the examples.

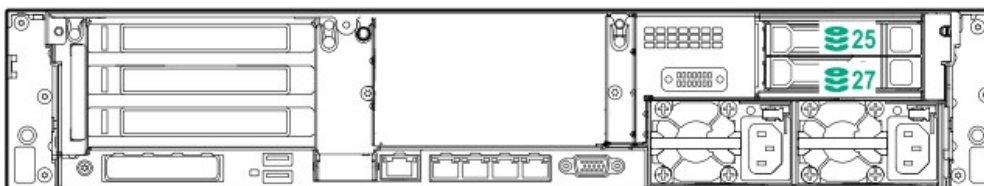
Front



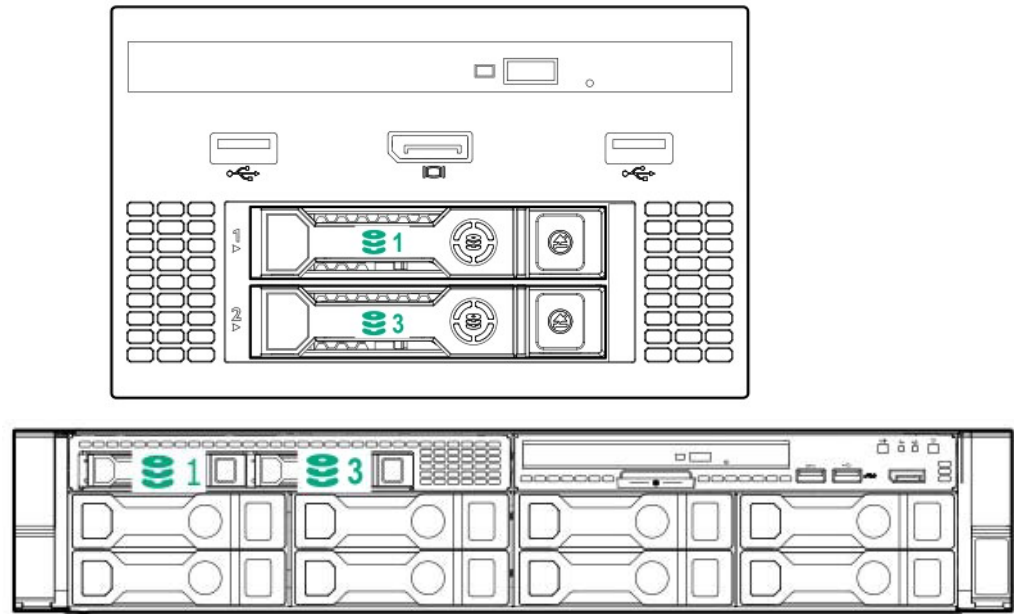
If an optional 2x 2.5 inch drive cage is connected to an SAS Expander, the drive bay number skips by one.

For example, in case 2x 2.5 inch drive cages at rear are connected to port 9 of SAS Expander, the drive bay numbers are 25 and 27.

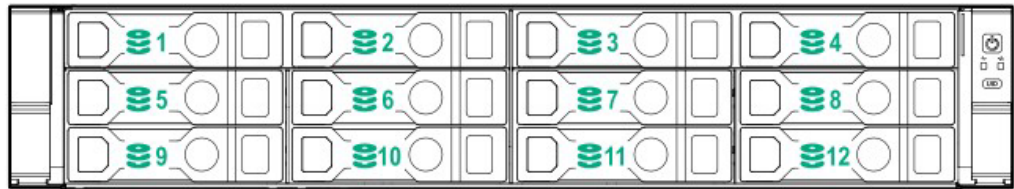
Rear



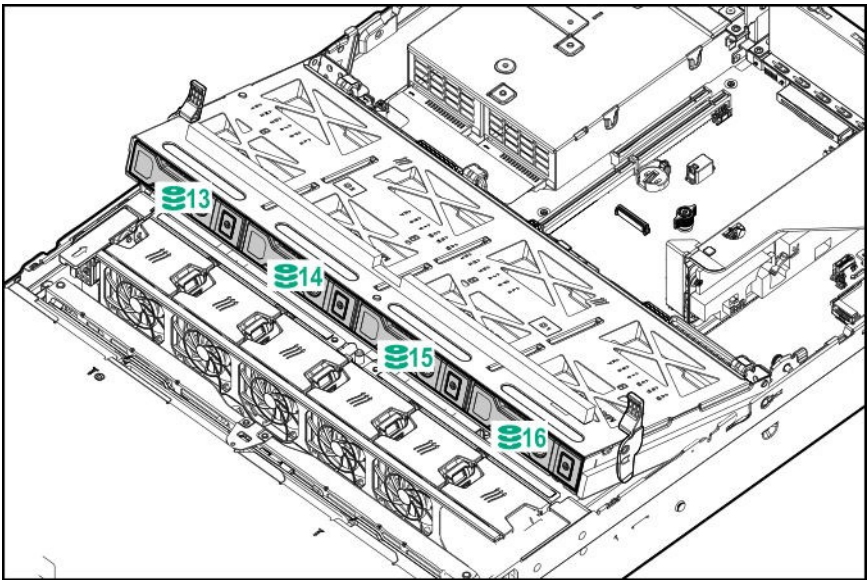
If 2x 2.5 inch drive cage are connected to port 3 of SAS Expander, the drive bay numbers are 1 and 3.



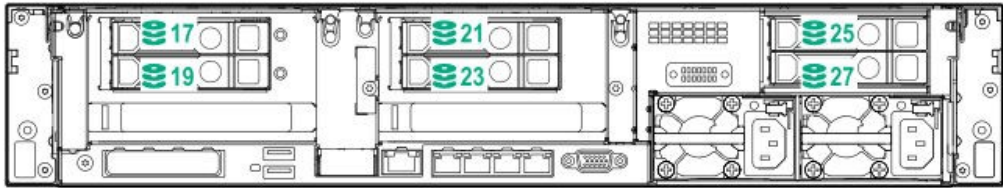
In the case of 12x 3.5 inch drive + middle 4x 3.5 inch drive + rear 2x2.5 inch drive cages x3



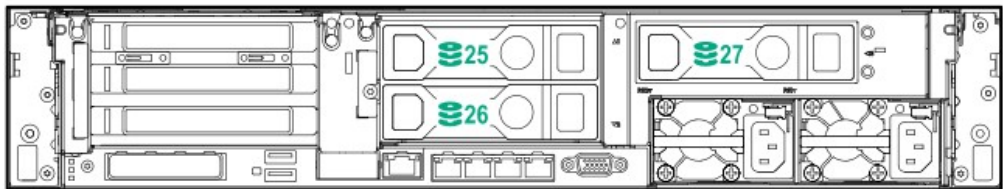
Mid



Rear 2.5-inch

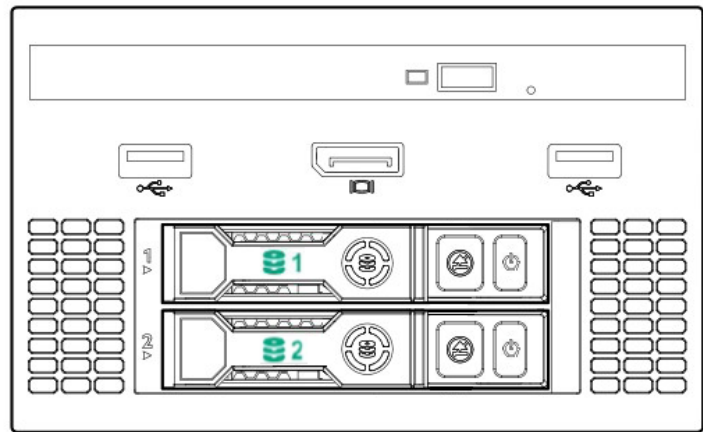


Rear 3.5-inch

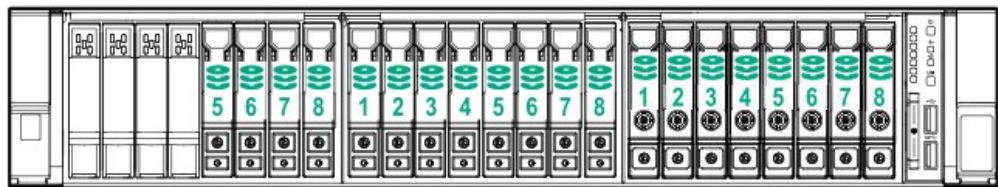


4.10.3 Drive Bay Number of PCIe SSD Drive

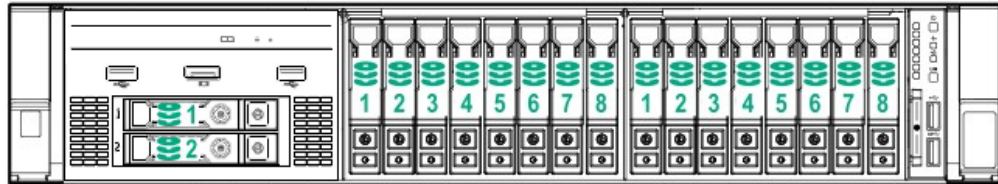
In the case that 2 PCIe SSD drives of the universal media bay are connected to PCIe SSD riser card



In the case that 12 PCIe SSD drives of BOX1 and BOX2 are connected to PCIe SSD riser card



In the case that 16 PCIe SSD drives of BOX2 and BOX3 are connected to PCIe SSD riser card





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# Preparations

This chapter describes preparations for using this server.

## **1. Installing Internal Optional Devices**

You can skip this section if you did not purchase any optional devices.

## **2. Installation and Connection**

Place the server in a suitable location and connect cables following this section.

# 1. Installing Internal Optional Devices



This section describes the instructions for installing supported optional devices and precautions.



## Important

Use only the devices and cables specified by NEC. You will be charged to repair damages, malfunctions, and failures caused by the use of any devices or cables not specified for use with this server even within the warranty period.

## 1.1 Safety Precautions

Be sure to observe the following precautions to install and remove optional devices properly and safely.



 <b>WARNING</b>	
	<p>Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, see Safety Precautions and Regulatory Notices.</p> <ul style="list-style-type: none"> <li>• Do not disassemble, repair, or modify the server.</li> <li>• Do not remove the lithium battery, NiMH battery, or Li-ion battery.</li> <li>• Disconnect the power plug when installing and removing devices.</li> </ul>

 <b>CAUTION</b>	
	<p>Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, see Safety Precautions and Regulatory Notices.</p> <ul style="list-style-type: none"> <li>• Do not drop</li> <li>• Do not leave the server being pulled out.</li> <li>• Make sure to complete installation.</li> <li>• Do not install with the cover removed.</li> <li>• Do not get your fingers caught.</li> <li>• High temperature</li> <li>• Electrical shock</li> </ul>

## 1.2 Overview of Installation and Removal

Install/remove components by using the following procedure.

Installing or removing internal parts such as hard disk drives, fan units, and power units is done while the rack is removed from the server. It is recommended that several people work together to remove the rack.

 <b>CAUTION</b>	
	<p>Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, see Safety Precautions and Regulatory Notices.</p> <ul style="list-style-type: none"><li>• Do not drop the server</li><li>• Do not leave the server pulled out of the rack</li><li>• Replace the cover after installing components</li><li>• Beware of high temperatures</li><li>• Do not get your fingers caught when installing components</li></ul>

1. If the server is mounted on a rack, use the UID switch to identify the target server.  
See *Chapter 2 (1.3 Installing Internal Optional Devices)*.

2. Remove Front Bezel.  
See *Chapter 2 (1.4 Removing Front Bezel)*.

3. Turn off the server.  
See *Chapter 3 (6. Turning Off the Server)*.

4. Disconnect the power cord from the outlet and the server.

<b>Important</b>	<ul style="list-style-type: none"><li>• After disconnecting the power cord from the server, wait for at least 30 seconds before installing/removing optional devices.</li><li>• Make sure AC POWER LED on power supply unit is unlit.</li></ul>
------------------	---

5. If only installing a disk drive, proceed to step 12. If only installing a power supply unit, proceed to step 13. When installing or removing other internal options, remove from the rack from the main device, and place it on a sturdy, flat desk.

<b>Important</b>	<b>Do not leave the server being pulled out from the rack.</b>
------------------	--

6. Remove Top Cover.  
See *Chapter 2 (1.5 Removing Top Cover)*.

7. Remove the air baffle.  
See *Chapter 2 (1.6 Removing the Air Baffle)*.
8. Depending on the components to be installed or removed, follow the procedure in order.  
See *Chapter 2 (1.7 ) to (1.32 Use of Internal Hard Disk Drives in the RAID System)*.
9. Attach the air baffle.  
See *Chapter 2 (1.33 Attaching the air baffle)*.
10. Attach Top Cover.  
See *Chapter 2 (1.34 Installing Top Cover)*.
11. Mount the server onto the rack.  
See *Chapter 2 (2.1 Installation)*.
12. Install disk drives.  
See *Chapter 2 (1.35 Drives )*.
13. Install power supply units  
See *Chapter 2 (1.36 Power Supply Unit)*.
14. Attach Front Bezel.  
See *Chapter 2 (1.37 Installing Front Bezel)*.

Installation and removal for internal optional devices are now complete.  
Continue the setup with reference to *Chapter 2 (2.2 Connection)*.

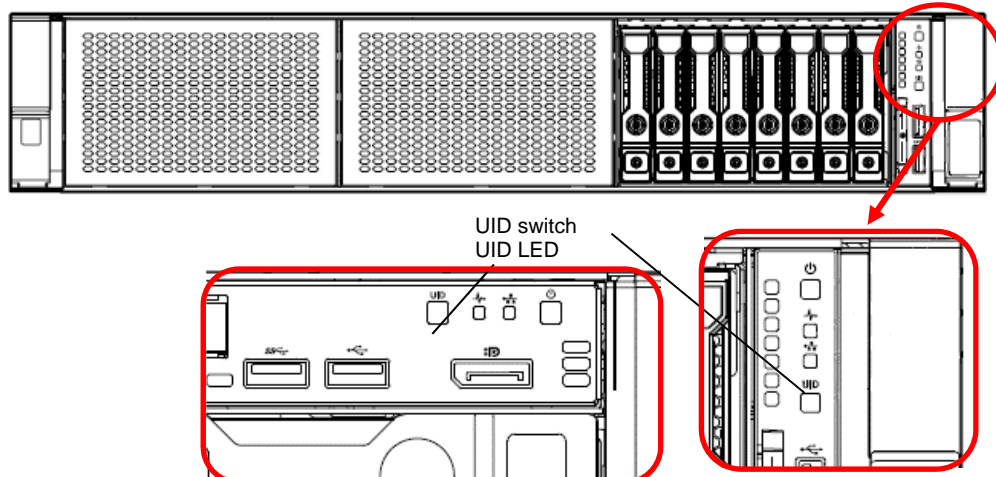
## 1.3 Identifying Servers (UID Switch)

Using UID (Unit ID) Switch helps you to identify the target server.

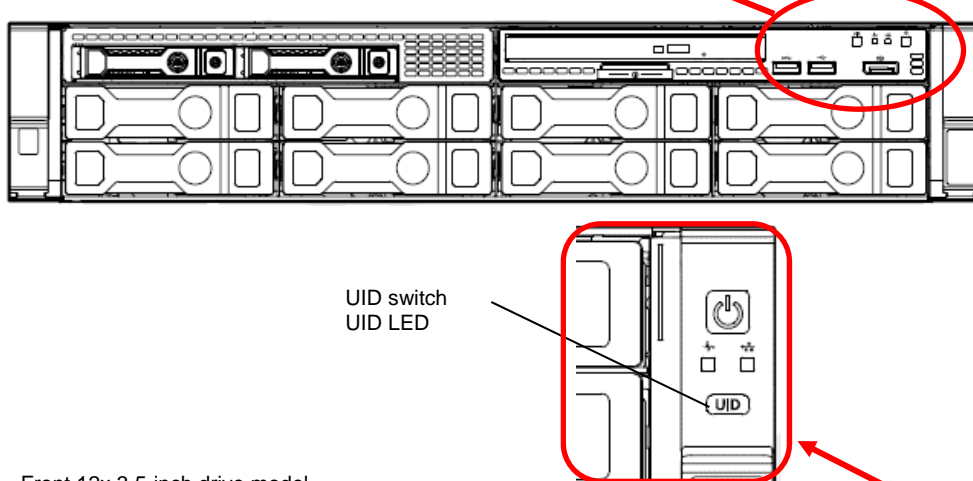
When the server is working, **be sure to identify the target server by using UID Switch first** before you turn off the server or disconnect a cable from the server.

To turn UID LED on, press UID Switch. When it is pressed again, the LED will be off.

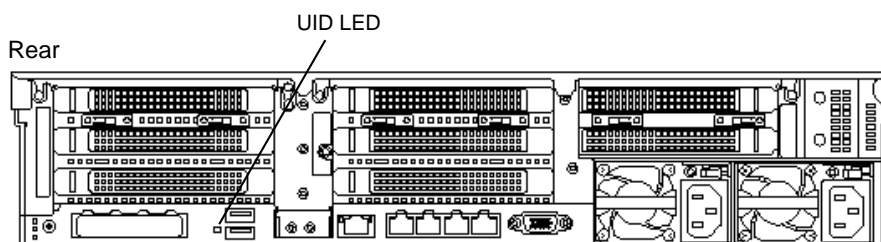
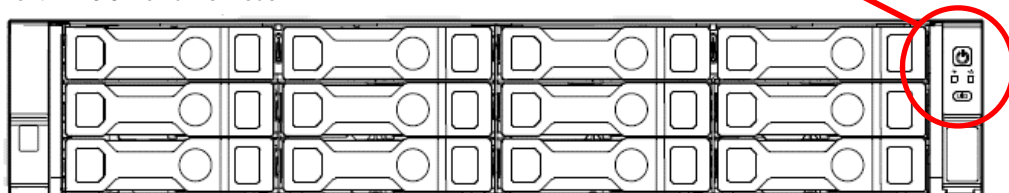
Front 8x 2.5-inch drive model / 24x 2.5-inch drive model



Front 8x 3.5-inch drive model



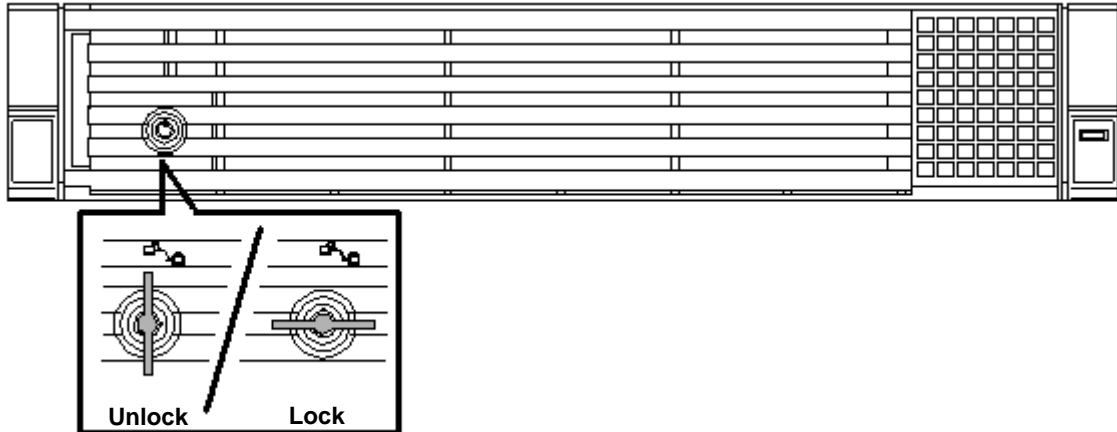
Front 12x 3.5-inch drive model



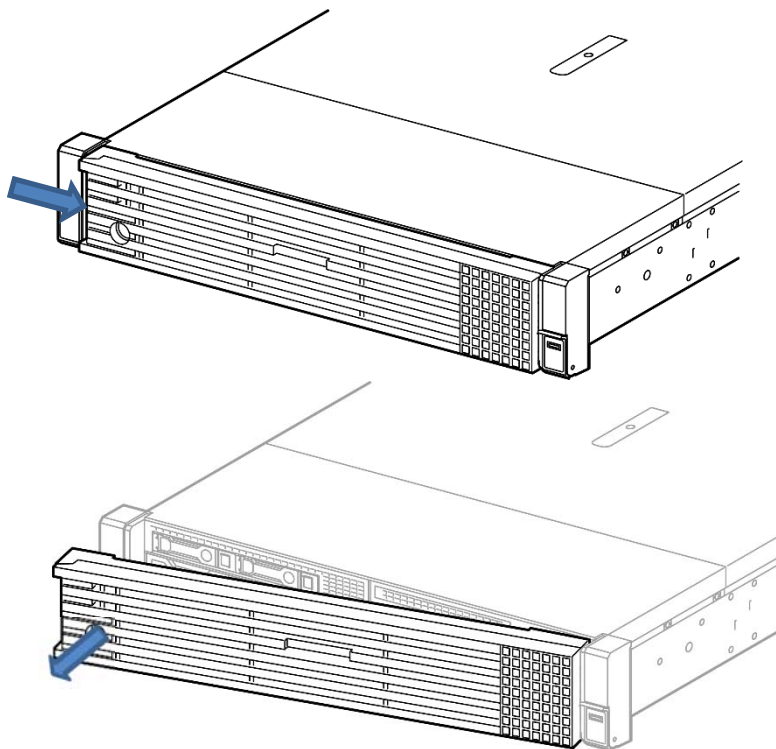
## 1.4 Removing Front Bezel

Remove the front bezel when pressing the POWER switch or removing Top Cover.

1. To unlock the bezel, insert the attached Bezel Lock Key into the key slot and turn the key.



2. Press to the right and unlock the lever seen on the left when you face the front bezel, and pull only the left side of bezel by about 10 cm toward you. Then, as shown in the diagram, pull the bezel to the left forward direction with the lock on the left unlocked to remove the bezel from the device.



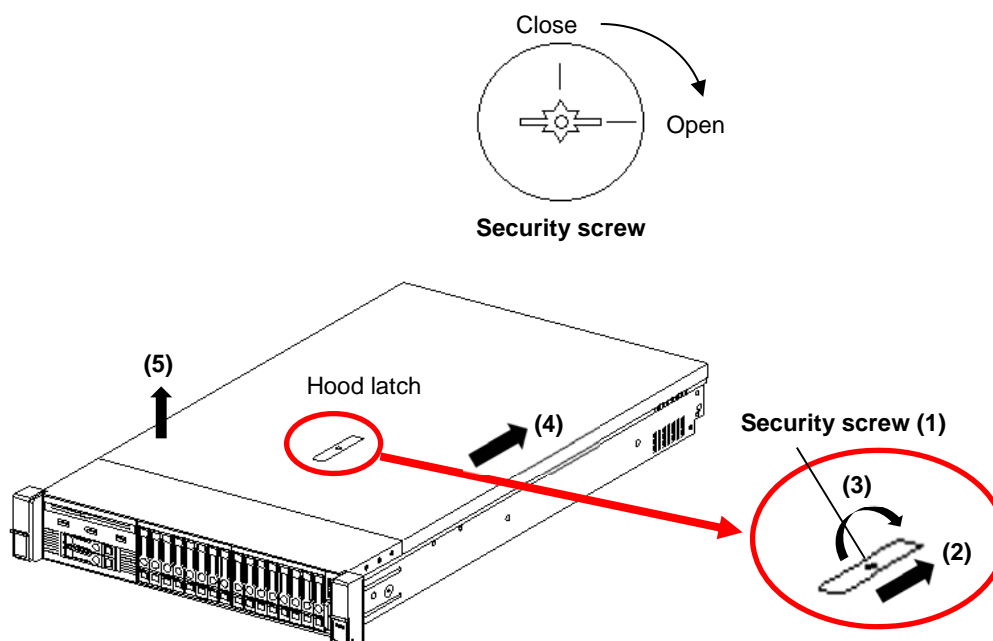
**Note** Be careful not to press the POWER Switch.

**Important** If you fail to remove the front bezel properly, the front bezel might be damaged. Pay attention not to press the power switch when installing the front bezel.

## 1.5 Removing Top Cover

Remove Top Cover when installing or removing the optional component or change internal cable connection.  
Please have ready a hexalobular driver (T-10) or flathead driver.

1. See steps 1 to 5 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Unscrew the security screw with the hexalobular driver or flathead driver.
3. Unlock the hood latch on the top by pressing from behind and raise the hood latch.



4. Slide the cover a little bit to the rear side of the chassis.
5. Lift Top Cover and remove it from the server.

## 1.6 Removing the Air Baffle

**Note**

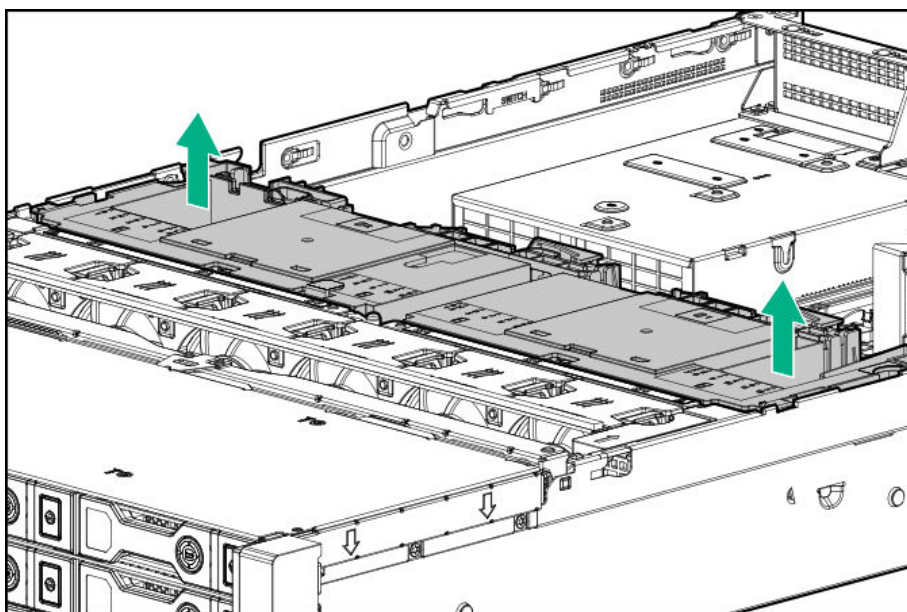
Do not remove the cable connecting the cache module from the battery pack. If the cable is disconnected, the data stored in the cache module will be lost.

**Note**

Do not let the server operate for extended lengths of time with the top cover, air baffle, expansion slot cover, or the blank cover removed. If the server operates under these conditions, it will not be properly ventilated and the cooling mechanism will not properly function, which may lead to damages due to high temperature.

When installing or removing internal optional devices, or when changing the internal cable connection, remove the air baffle.

1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Press both sides of the air baffle, and pull it upwards to remove it.





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## 1.7 TPM Kit N8115-35

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### Overview

Install the TPM (Trusted Platform Module) Kit unit according to the instructions in this section to enable it.

There are two steps to follow.

1. Installation of TPM Kit
2. Enabling TPM
3. Retaining the recovery key/password.

When using drive encryption technologies, such as Microsoft Windows BitLocker Drive Encryption feature, you must enable TPM. For more information, see the Microsoft Web site.

#### Note

If the TPM is removed from the original server and powered up on a different server, data stored in the TPM including keys will be erased. Be careful not to press the POWER Switch.

### TPM 2.0 Guidelines

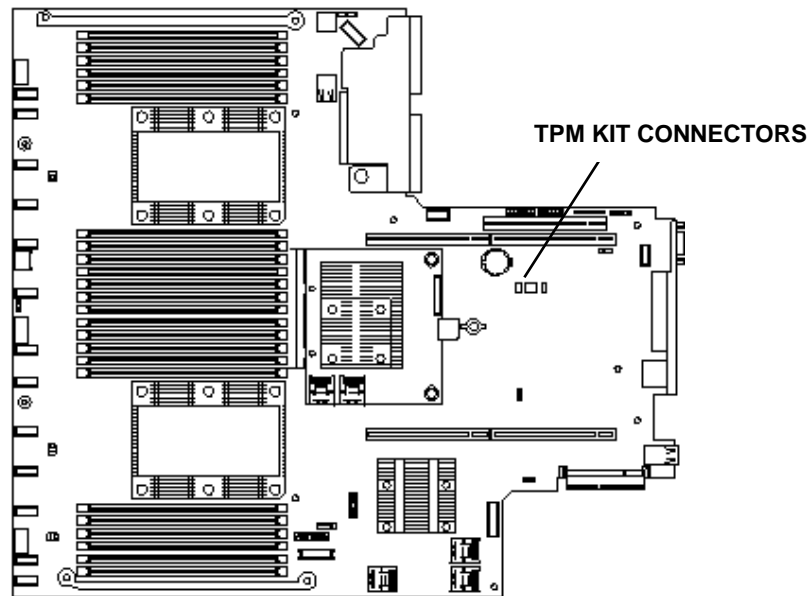
#### Important

Always observe the guidelines in this document. Failure to follow these guidelines can cause hardware damage or halt data access.

When installing or replacing a TPM, observe the following guidelines:

- Do not remove an installed TPM. Once installed, the TPM is bound to the system board. If an OS is configured to use the TPM and it is removed, the OS may go into recovery mode, data loss can occur, or both.
- When installing or replacing hardware, our service providers cannot enable the TPM or the encryption technology. For security reasons, only the customer can enable these features.
- When returning a system board for service replacement, do not remove the TPM from Motherboard. When requested, our service provides a TPM with the spare Motherboard.
- Any attempt to remove the cover of an installed TPM from Motherboard can damage the TPM cover, the TPM, and Motherboard.
- If the TPM is removed from the original server and powered up on a different server, data stored in the TPM including keys will be erased.
- When using BitLocker, always retain the recovery key/password. The recovery key/password is required to complete Recovery Mode after BitLocker detects a possible compromise of system integrity or system configuration.
- Our company is not liable for blocked data access caused by improper TPM use. For operating instructions, see the TPM documentation or the encryption technology feature documentation provided by the operating system.

Check the position of the TPM installer connector on the figure below.



### 1.7.1 Installing the N8115-35 TPM Kit

#### Procedure

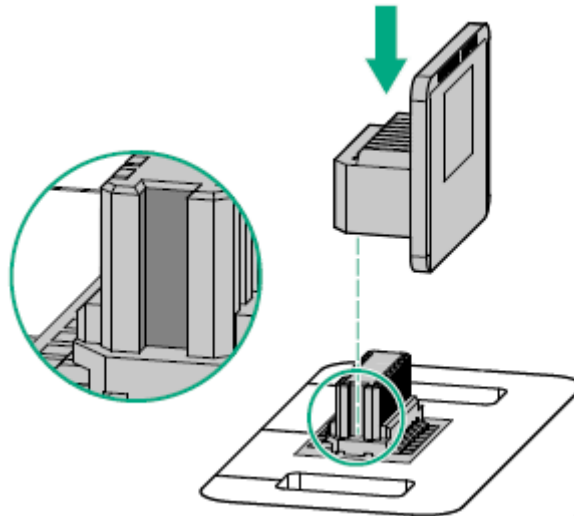
**Important** To reduce the risk of personal injury, electric shock, or damage to the equipment, remove power from the server by removing the power cord. The front panel Power On/Standby button does not shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

**Important** To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system

To install the components, follow these steps.

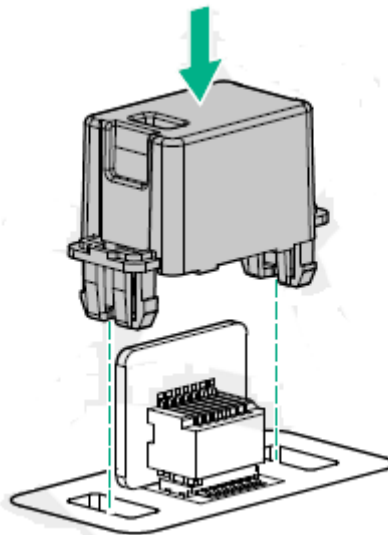
1. Update System Utility  
Please download the latest version from our support center website. For updating System utility, please follow the instructions on the website.
2. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
3. Temporarily remove options and cables that prevent the installation of TPM.

4. Match the TPM kit with the connector grooves on the motherboard. Press the connector in firmly and install the TPM kit. Please check the location of the TPM connector on the motherboard by looking at the quick reference level attached to the back of the top cover.

**Note**

If you try to remove the already attached TPM from the motherboard you may cause injury to the TPM cover, TPM, and motherboard. If it was installed on a different device, the data (including the key) stored in TPM are deleted when the power is turned on. the TPM that has been removed from the original server and installed on another server.

5. Installing the TPM cover.
  - (1) Align the holes and locking latches on both sides of the TPM connector.
  - (2) Press down the center of the cover firm and straight until you hear a locking sound.



6. Re-attach the options and cables that were removed in step 3.
7. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

8. Please see *Chapter 2 (2 Installation and Connection)* in this manual to conduct installation and connection, and turn the power supply ON.

**Important** TPM Kit once installed cannot be removed.  
Ask your sales representative if you want to remove the TPM kit.

### 1.7.2 Enable TPM

---

#### Procedure

1. During the server startup sequence, press the **F9** key to access **System Utilities**.
2. From the System Utilities screen, select **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security > Trusted Platform Module options**.
3. Verify the following:
  - "Current TPM Type" is set to **TPM 2.0**.
  - "Current TPM State" is set to **Present and Enabled**.
  - "TPM Visibility" is set to **Visible**.
4. If changes were made in the previous step, press the **F10** key to save your selection.
5. If F10 was pressed in the previous step, do one of the following:
  - If in graphical mode, click **Yes**.
  - If in text mode, press the **Y** key.
6. Press the **ESC** key to exit System Utilities.
7. If changes were made and saved, the server prompts for reboot request. Press the **Enter** key to confirm reboot.

If the following actions were performed, the server reboots a second time without user input. During this reboot, the TPM setting becomes effective.

  - Changing TPM bus from FIFO to CRB
  - Enabling or disabling TPM
  - Clearing the TPM
8. Enable TPM functionality in the OS, such as Microsoft Windows BitLocker or measured boot.

For more information, see the **Microsoft website**.

If you need detailed information on the update of firmware and the procedure of hardware, refer to the Web Site of NEC Support Center.

### 1.7.3 Retaining the recovery key/password

---

The recovery key/password is generated during BitLocker setup, and can be saved and printed after BitLocker is enabled. When using BitLocker, always retain the recovery key/password. The recovery key/password is required to enter Recovery Mode after BitLocker detects a possible compromise of system integrity.

To help ensure maximum security, observe the following guidelines when retaining the recovery key/password:

- Always store the recovery key/password in multiple locations.
- Always store copies of the recovery key/password away from the server.
- Do not save the recovery key/password on the encrypted hard drive.

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## 1.8 Processor (CPU)

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You can configure the multi-processor system by adding an optional processor.

**Note**

- In order to prevent damage to the processor or system board, please ensure that only an authorized representative conducts replacements and installation of the processor on this server.
- In order to prevent server malfunctions or damage to the equipment, for multiprocessor configuration make sure to use a processor with the same product number.

**Important**

- To avoid static electricity, see *Chapter 1 (1.8 Anti-static Measures)* in *Safety Precautions and Regulatory Notices*.
- Make sure to use the CPU authorized by NEC. Installing a third-party CPU may cause a failure of the CPU as well as the motherboard. Repair of the server due to failures or damage resulted from installing such a CPU will be charged.
- Update the system ROM before installing the processor if a higher speed processor is to be installed.

**Note**

- Pins on the motherboard are very fragile and easily damaged. To avoid damaging the motherboard, do not touch the processor or processor socket contact point.
- When handling the heat sink always hold along the fin shaft. You may damage the fin by holding it.

**Tips**

After adding the CPU, Windows may record the event log to System category of Event Viewer, but it is no problem for operation.

### 1.8.1 Maximum number of processor cores supported by this server

The maximum number of processor cores (logical processors) available on the server depends on the architecture (x86 architecture) and OS specs.

OS	The maximum number of logical processors supported by OS	The maximum number of logical processors supported by this server
Microsoft Windows Server 2012 R2 Standard Microsoft Windows Server 2012 R2 Datacenter	640 *1	112
Microsoft Windows Server 2016 Standard Microsoft Windows Server 2016 Datacenter	640 *1	112
VMware ESXi 6.0	480	112
VMware ESXi 6.5	576	112

\*1: When Hyper-V is used, the maximum number of logical processors is as shown below:

- Windows Server 2012 R2 :320
- Windows Server 2016: 512

### 1.8.2 Installation

Please prepare the following before installing the option.

- Parts included in the optional processor heat sink kit
- T-30 hexalobular driver

To install the components, follow these steps.

1. See steps 1 to 7 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations
2. For the 3.5-inch drive model, if the mid-plane drive cage is attached, it must be removed.
3. Install the processor heatsink assembly:
  - ① Locate and align the Pin 1 indicator on the processor carrier and the socket.

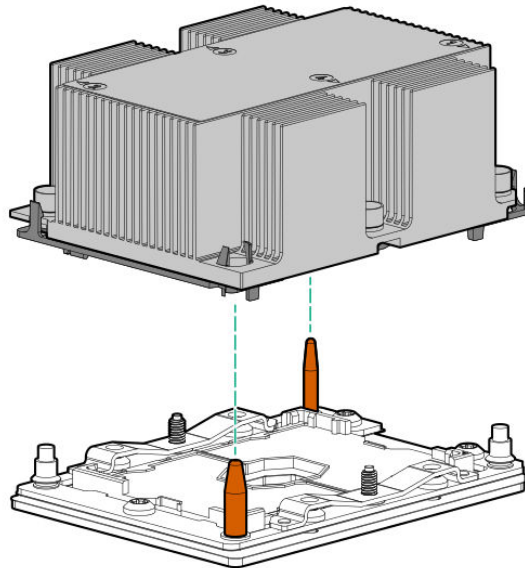
**Note**

Keep the removed protective cover for future use.

- ② Align the processor-heatsink module with the heatsink alignment pins and gently lower it down until it sits evenly on the socket.

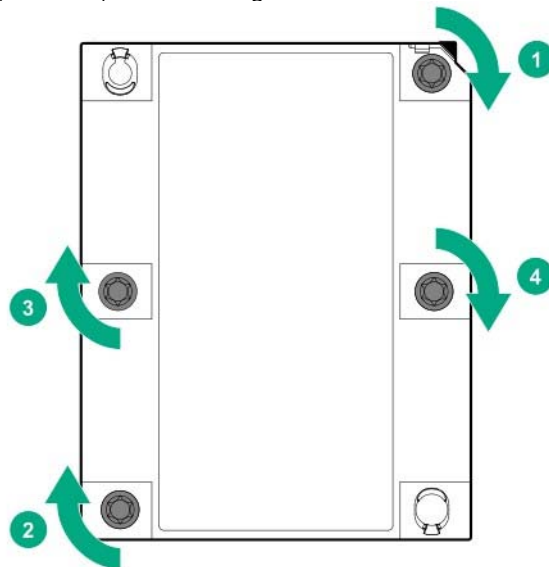
The heatsink alignment pins are keyed. The processor will only install one way.

Your heatsink may look different than the one shown.

**Note**

Be sure to tighten each heatsink nut fully in the order indicated. Otherwise, boot failure or intermittent shutdowns might occur. Do not touch the point of contact of the processor.

- ③ Using a T-30 Hexalobular screwdriver, fully tighten each heatsink nut in the order indicated on the heatsink label (1 -2 -3 -4) until it no longer turns.

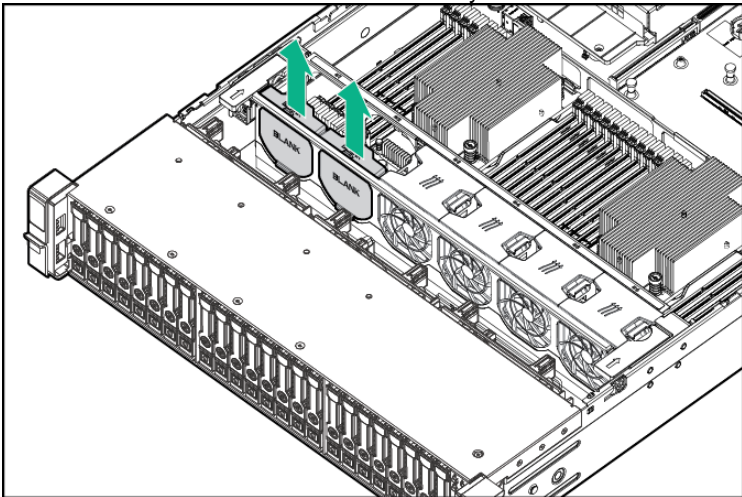


4. If installing a second processor, install fans in bays 1 and 2. These fans are provided with the processor option kit.
5. Make sure that the heat sink is installed on a level with the motherboard.

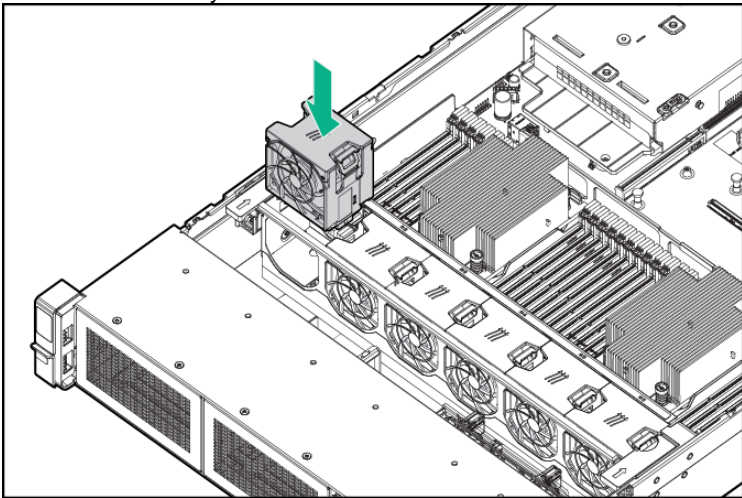
**Note**

- If the heat sink is not level, remove it, and then install it again.  
The following probably causes the heat sink not to be level:
  - The CPU is not positioned correctly.
  - All screws are not completely tightened.
- Do not move the secured heat sink.

- 6. Install an additional fan unit provided with additional CPU kit.  
Remove the fan blank cover from the fan bay.

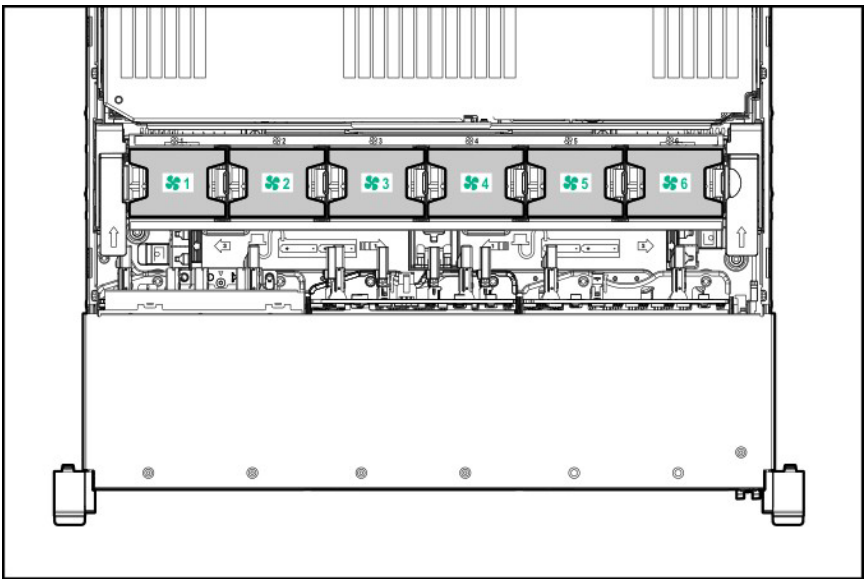


- 7. Attach the fan to bay 1 and 2.



Fan connection conditions are shown in the table below.

Fan bay	1	2	3	4	5	6
Configuration						
1xCPU	Blank cover	Blank cover	Fan	Fan	Fan	Fan
2xCPU	Fan	Fan	Fan	Fan	Fan	Fan





8. See *Chapter 2 (1.33 Attaching the air baffle)* to attach the air baffle.
9. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

10. Please see *Chapter 2 (2 Installation and Connection)* in this manual to conduct installation and connection, and turn the power supply ON.

### 1.8.3 Identifying processor type

---

The type of processor installed on the server is displayed simply on the POST. To view this information and additional processor specifications follow the directions below

1. Reboot the server.  
The server restarts and the POST screen is displayed.
2. Press <F9> key.  
System Utility screen appears.
3. Select **System Information > Processor Information**.  
More information about the processors installed on the server appears on the screen.
4. Keep pressing <ESC> key until the main menu is displayed.
5. The menu below will appear, select **OK** from the system utility and switch to boot mode.

### 1.8.4 Replacement / Removal

---

**Important**

- Do not remove any CPU unless it is failed.
- In case you take off the CPU but do not fit a protection cover or dummy cover, the cooling effect declines and the device may break down.

To remove CPU, reverse the installation procedure.

Also follow the steps below if the CPU was removed.

1. Mount the protective cover to CPU socket.
2. Remove the additional fan unit.
3. Attach the fan blank cover.

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## 1.9 High-performance fan N8181-158

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### 1.9.1 Installing N8181-158 High-performance fan

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**Note**

To prevent damage to the server, confirm that all DIMM latches are locked before installing the fans.

**Note**

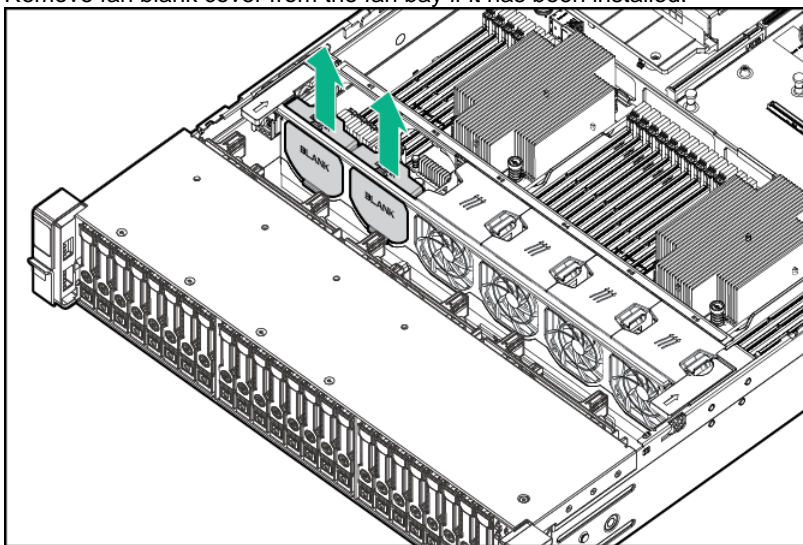
Do not let the server operate for extended lengths of time with the top cover open or removed. When operating under these conditions, poorly controlled airflow and cooling will make it to overheat and cause damage.

**Note**

In order to prevent the damage to electronic components, please start to install the system after conducting the appropriate anti-static treatment. There is a possibility of causing electrostatic discharge if appropriate grounding wire treatment is not conducted.

To install the components, follow these steps.

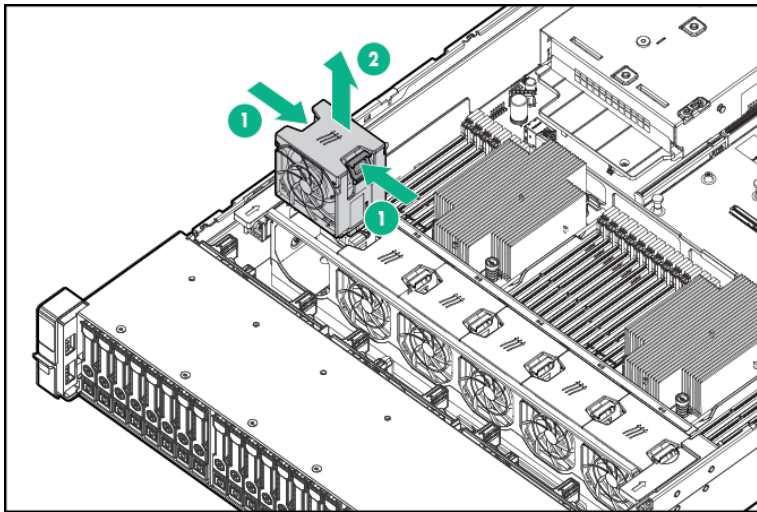
1. See steps 1 to 7 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Remove fan blank cover from the fan bay if it has been installed.

**Note**

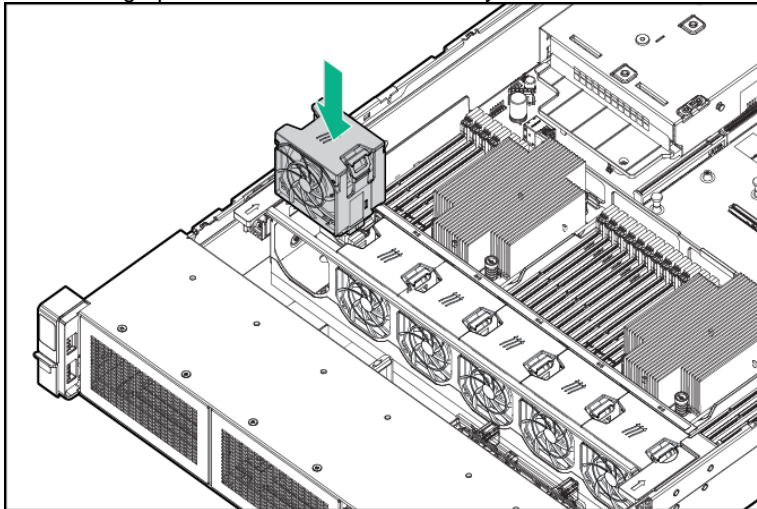
Keep each removed fan blank covers.

3. Remove all standard fans from the fan bays.

**Important** Do not mix standard and high-performance fans in the same server.



4. Install all high-performance fans to the fan bay.



5. See *Chapter 2 (1.33 Attaching the air baffle)* to attach the air baffle.
6. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

**Note** In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

7. Please see *Chapter 2 (2 Installing Internal Optional Devices)* in this manual to conduct installation and connection, and turn the power supply ON.

## 1.9.2 Removal

The procedure for removal is the reverse of installation.

Re-attach the blank cover if you operate without it attached.

**Important** Re-attach the blank cover removed to maintain the internal cooling.

### 1.9.3 Hot-pluggable fan

**Note**

To avoid server parts from being damaged, the fan blank cover at x1 CPU configuration must be installed in the Fan 1 and 2 positions.

**Note**

To avoid the server from being damaged, do not operate the server for extended lengths of time without the appropriate number of fans installed. The server may start, but it is not recommended to let it operate without the necessary fans installed.

The following displays the structure for installing cooling fans.

Configuration	Fan bay 1	Fan bay2	Fan bay3	Fan bay4	Fan bay5	Fan bay6
CPU x1	Blank cover	Blank cover	Fan	Fan	Fan	Fan
CPU x1, 24x 2.5-inch configuration CPU x1, 12x 3.5-inch configuration High performance fan	Fan	Fan	Fan	Fan	Fan	Fan
CPU x2	Fan	Fan	Fan	Fan	Fan	Fan

For CPU x1 configuration (except for 24 x 2.5-inch configuration and 12 x 3.5-inch configuration), 4 fans and 2 blanks are required for redundancy. If the cooling fan fails or lacks, the redundancy will fail.

For CPU x2 configuration or CPU x1 24 x 2.5-inch configuration or 12 x 3.5-inch configuration, 6 fans are required for redundancy. If the cooling fan fails or lacks, the redundancy will fail.

High-performance fans may be necessary in 24 x 2.5-inch configuration and 12 x 3.5-inch configuration for the following devices:

- Installing optional GPU riser

This device monitors the temperature inside the server, controls the cooling fan, and cools down the server to the proper temperature.

The server will undergo a normal shutdown process under the following temperature conditions :

- If the temperature in caution level is detected, iLO 5 performs a normal shutdown at POST execution and OS. If the server hardware detects temperature in the critical level before a normal shutdown, the server performs an immediate shutdown.
- With "Thermal Shutdown" feature set to "Disabled" in "BIOS/Platform Configuration (RBSU)," iLO5 does not execute the usual shut down even if it detects a temperature over an alarming level.  
Even with this feature set to "Disabled," the hardware of Server shuts down immediately if it detects a cautious level of temperature.

**Note**

If the shutdown function due to high temperature is disabled in system utility, equipment parts may become damaged by high temperatures.

**Tips**

In case NEC ESM PRO ServerAgentService is installed, since a shut down due to high temperature is executed by NEC ESM PRO ServerAgentService, you need to set "Thermal Shutdown" to "Disabled."

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## 1.10 High-performance CPU heat sink module N8101-1286, 1U heat sink

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This procedure is illustrated with a standard heat sink as the example. The install method is same for all heat sinks. Before installing, check the parts of processor, heat sink, and plug.

### 1.10.1 Handling precautions

---

To prevent personal injury, electrical shock or equipment damage, unplug the power cord and ensure no power is supplied to the server. You cannot turn off the system power supply completely by the power button on the front panel. Until the AC power cord is unplugged, the power supply circuit is still active in some parts of the machine.

### 1.10.2 Installation

---

**Note**

Installing a high-performance heatsink requires the installation of a processor assembly onto the heatsink. To avoid damage to server or components, do not remove or install the processor assembly when installing or replacing other heatsinks.

Please prepare the following before installing the option.

- Parts included in the optional processor heat sink kit
- T-30 hexalobular driver
- 1/4" flat blade screwdriver or nonconductive tool

To install the components, follow these steps.

1. Please follow the cautions below.

**Note**

- The processor assembly must be removed and replaced as a unit. Do not remove the processor from the carrier.
- When handling the heatsink, always hold it along the top and bottom of the fins. Holding it from the sides can damage the fins.
- **THE CONTACTS ARE VERY FRAGILE AND EASILY DAMAGED.** To avoid damage to the socket or processor, do not touch the contacts.

**Note**

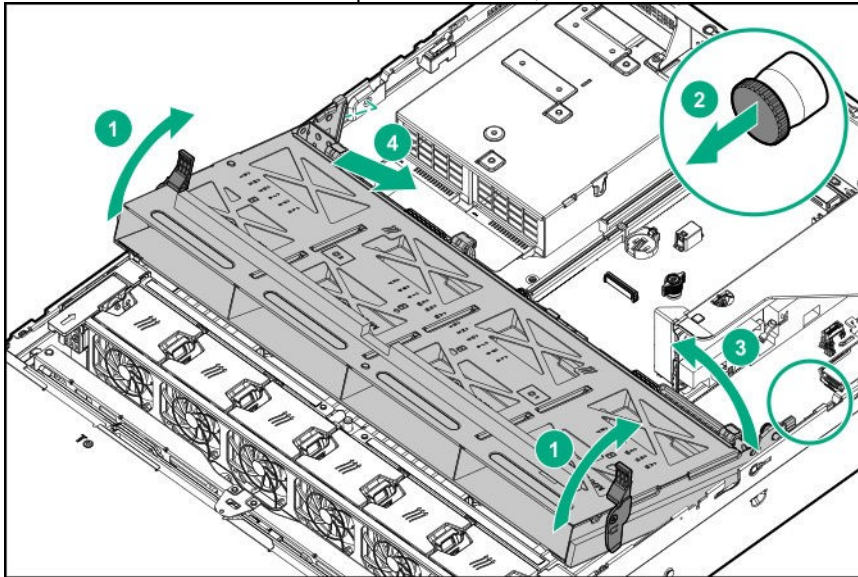
- To avoid damage to the mother board and processor please ensure that only licensed staff conduct installation and replacement of the processor.
- To prevent server malfunction and damage to the equipment, multiprocessor configuration process the same part numbers.
- When operating the processor at an even faster speed, update the system ROM before installing the processor.

2. See steps 1 to 7 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.

**Note**

- Be sure to loosen each heatsink nut in the order indicated. Otherwise, damage might occur to the heatsink or processor.
- Install the processor heatsink assembly as soon as possible after removing it. Do not leave the processor socket unpopulated for extended periods of time.

3. In case a 4x3.5-inch drive of mid plane is installed, remove it.

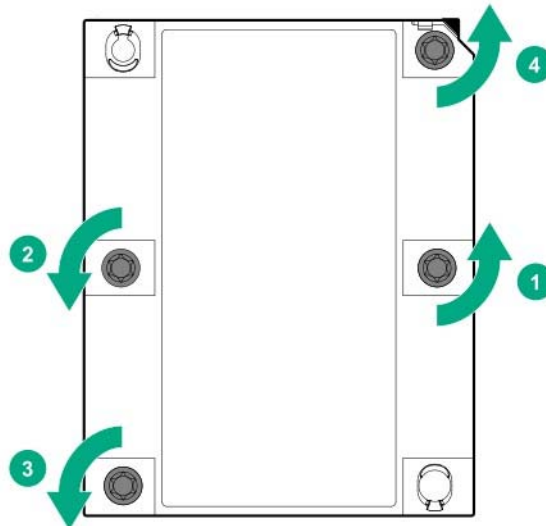


4. Remove the processor heat sink module.

- (1) Wait for the heat sink to cool.
- (2) Use a hexalobular driver to loosen the heat sink screws (4 PCs) in the following order (1→2→3→4).

**Note**

Contacts on the motherboard are very fragile and easily damaged. To avoid damage to the motherboard, do not touch the processor or processor socket contact.



- (3) Lift the processor heat sink module up and remove.
  - (4) Turn over the heat sink module and position the contact surface of the processor at the top.
  - (5) Install the protective cover on the processor socket.
5. Remove the processor from the heat sink
- (1) Locate the release slot between the processor and heat sink.  
Release slot is located on the opposite side of the pin 1 mark.

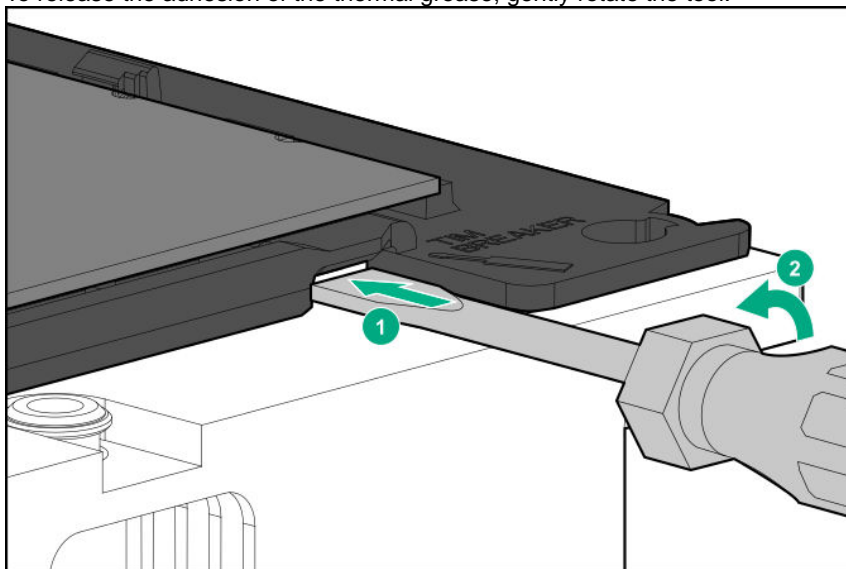


- (2) Insert a 1/4-inch wide flat-blade screwdriver into the release slot.

**Note**

To avoid damage to the processor, insert the tool between the processor and the heatsink base. The opening in the carrier provides access to a gap between the processor heatsink spreader and the heatsink base.

- (3) To release the adhesion of the thermal grease, gently rotate the tool.



- (4) Unlatch the remaining corners of the processor assembly.

- (5) Separate the processor assembly from the heatsink.

The processor remains attached to the carrier.

6. Using alcohol, remove thermal grease adhering to the processor.

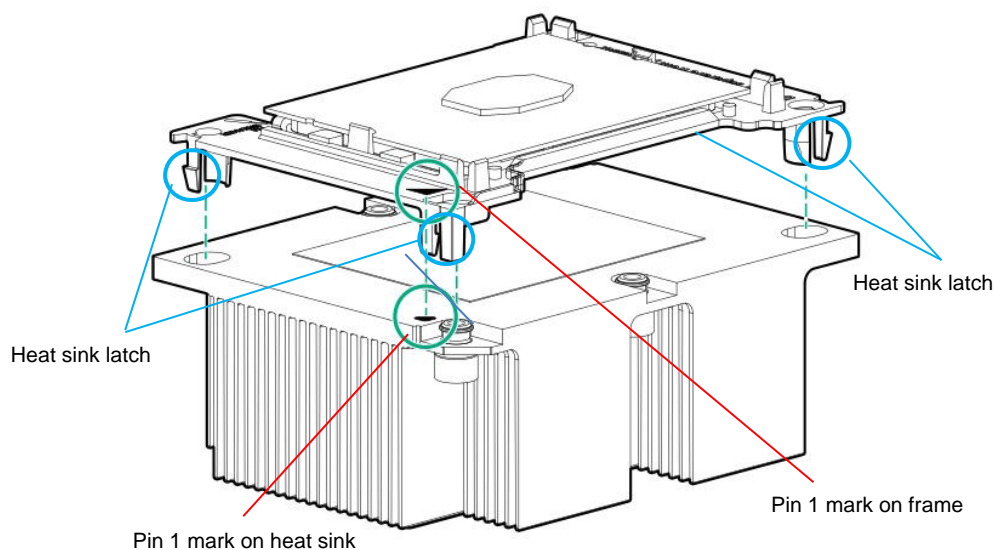
Before new thermal grease adheres, dry the alcohol.

**Note**

Do not touch the point of contact of the processor.

7. Remove the dust cover of the high-performance heat sink.

8. Align the pin mark 1 on the processor frame with the pin mark 1 on the high performance heat sink, gently press the four corners of the processor frame from the top securing the heat sink latch on the high performance heat sink and attach.



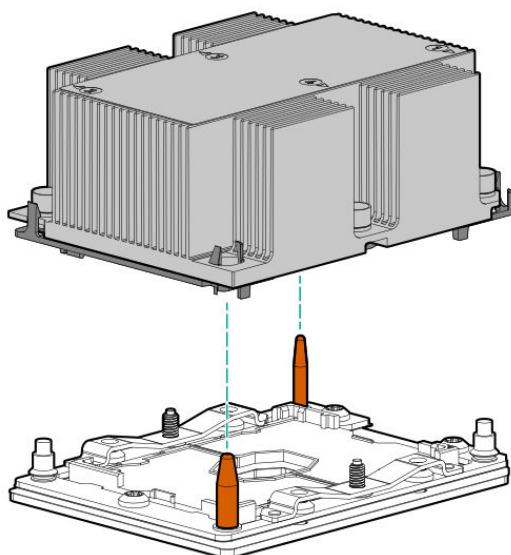
9. Confirm the location of the processor, remove the processor socket protective cover.

**Note**

Keep the removed protective cover for future use.

10. Install the processor heatsink assembly:

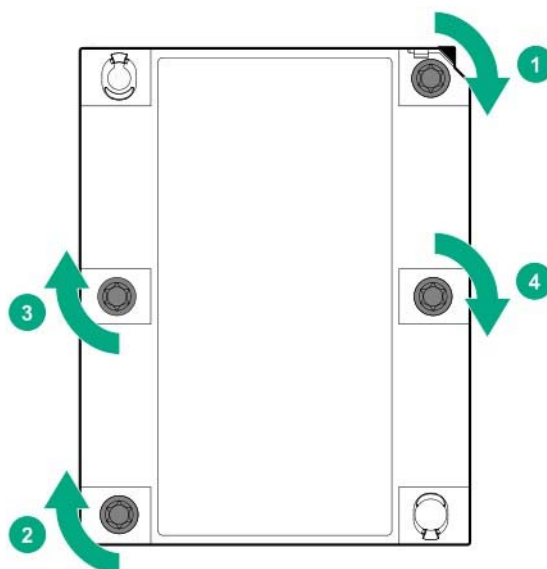
- ① Locate the Pin 1 indicator on the processor carrier and the socket.
- ② Align the processor heatsink assembly with the heatsink alignment pins and gently lower it down until it sits evenly on the socket. The heatsink alignment pins are keyed. The processor heatsink assembly will only install one way.



- ③ Using a T-30 hexalobular screwdriver, fully tighten each heatsink nut until it no longer turns.

**Note**

Be sure to tighten each heatsink nut fully in the order indicated. Otherwise, boot failure or intermittent shutdowns might occur.





11. Make sure that the heat sink is installed on a level with the motherboard.

**Note**

- If the heat sink is not level, remove it, and then install it again. The following probably causes the heat sink not to be level:
  - The CPU is not positioned correctly.
  - All screws are not completely tightened.
- Do not move the secured heat sink.

12. See *Chapter 2 (1.33 Attaching the air baffle)* to attach the air baffle.
13. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

14. Please see *Chapter 2 (2 Installation and Connection)* in this manual to conduct installation and connection, and turn the power supply ON.

### 1.10.3 Identifying processor type

---

The type of processor installed on the server is displayed simply on the POST. To view this information and additional processor specifications follow the directions below

1. Reboot the server.  
The server restarts and the POST screen is displayed.
2. Press <F9> key.  
System utility screen appears.
3. Select **System Information > Processor Information**.  
More information about the processors installed on the server appears on the screen.
4. Keep pressing <ESC> key until the main menu is displayed.
5. The menu below will appear, select **OK** from the system utility and switch to boot mode.

### 1.10.4 Removal

---

**Important**

- Do not remove any CPU unless it is failed.
- In case you take off the CPU but do not fit a protection cover or dummy cover, the cooling effect declines and the device may break down.

To remove CPU, reverse the installation procedure.

Also follow the steps below if the CPU was removed.

1. Mount the protective cover to CPU socket.
2. Remove the additional fan unit.
3. Mount the fan blank cover.

## 1.1.1 DIMM

Install a Dual Inline Memory Module (DIMM) to a DIMM slot on the motherboard in the server. The motherboard provides 24 slots to install DIMMs.

### Important

- To avoid static electricity, see *Chapter 1 (1.8 Anti-static Measures) in Safety Precautions and Regulatory Notices*.
- Use only the specified DIMMs. Installing a DIMM from a third party may damage not only the DIMM but the motherboard. You will be charged to repair failures or damages caused by the use of such products even within the warranty period.

### Tips

Up to 3072GB (128 GB x 24) can be installed in 2-CPU configuration. Up to 1536 GB (128 GB x 12) can be installed in 1-CPU configuration. No DIMM is factory installed in standard configuration.

The memory subsystem in this server supports LRDIMM and RDIMM.

- RDIMM offers address parity protection.
- LRDIMM supports a higher density than a single rank or dual-rank. For this reason, you can provide higher system capacity and bandwidth by installing larger capacity DIMM.

For the information corresponding to all the types, all the types are referred to as DIMM. If you specify LRDIMM or RDIMM, the information is applicable only to the type. It is necessary that the type of all of the memory installed on the server is the same.

### Important

**This server does not support mix of LRDIMM and RDIMM. If you allow the mix of any combination of these DIMM, there is a possibility that the server stops during POST.**

### 1.1.1.1 Maximum supported memory size

The maximum available memory size on the server depends on the architecture and OS specs.

#### Maximum memory sizes

OS	The maximum memory size supported on each OS	The maximum memory size supported on the server
Microsoft Windows Server 2012 R2 Standard *1 Microsoft Windows Server 2012 R2 Datacenter *1	4TB	3.0TB
Microsoft Windows Server 2016 Standard *1 Microsoft Windows Server 2016 Datacenter *1	24TB	3.0TB
VMware ESXi 6.0 *2	6TB	3.0TB
VMware ESXi 6.5 *3	12TB	3.0TB

\*1: Shown below is the maximum memory size when Hyper-V is used:

- Windows Server 2012 R2: Up to 4TB

\*2: Up to 4 TB on virtual machine

\*3: Up to 6 TB on virtual machine

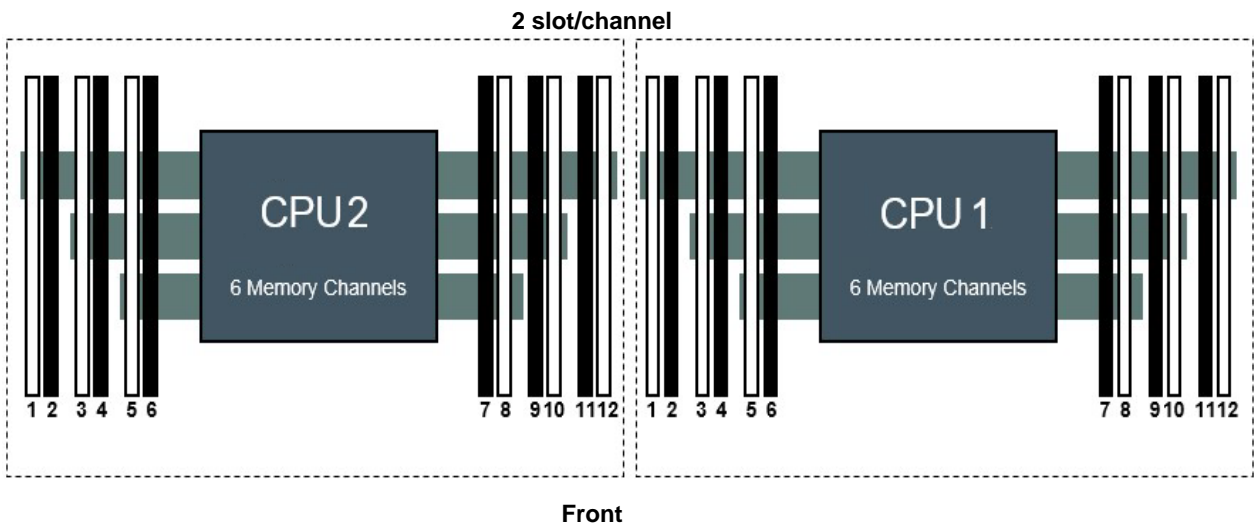
1.11.2 DIMM installation order

Note

See Memory RAS features supported by additional memory board in 1.11.3  
Memory RAS Feature before using memory RAS feature.

This server's memory subsystem is divided into channels. Each processor supports 6 channels and each channel supports 2 DIMM slots.

Slot number shows DIMM slot ID for spare replacement.  
Please see the following chart for the location of the slot number.



The order of installation may be different on x1CPU (PROC1) configuration and x2 CPU (PROC1, PROC2) configuration.

When only CPU1 is mounted

Mounted number	CPU1 slot number											
1 DIMM							8					
2 DIMM							8		10			
3 DIMM							8		10		12	
4 DIMM			3		5		8		10			
5 DIMM			3		5		8		10		12	
6 DIMM	1		3		5		8		10		12	
7 DIMM	1		3		5		7	8		10		12
8 DIMM			3	4	5	6	7	8	9	10		
9 DIMM	1		3		5		7	8	9	10	11	12
10 DIMM	1		3	4	5	6	7	8	9	10		12
11 DIMM	1		3	4	5	6	7	8	9	10	11	12
12 DIMM	1	2	3	4	5	6	7	8	9	10	11	12

When CPU1 and CPU2 are mounted

Mounted number	CPU2 slot number											
2 DIMM							8					
3 DIMM							8					
4 DIMM							8		10			
5 DIMM							8		10			
6 DIMM							8		10		12	
7 DIMM							8		10		12	
8 DIMM		3		5			8		10			
9 DIMM		3		5			8		10			
10 DIMM		3		5			8		10		12	
11 DIMM		3		5			8		10		12	
12 DIMM	1	3		5			8		10		12	
13 DIMM	1	3		5			8		10		12	
14 DIMM	1	3		5		7	8		10		12	
15 DIMM	1	3		5		7	8		10		12	
16 DIMM		3	4	5	6	7	8	9	10			
17 DIMM		3	4	5	6	7	8	9	10			
18 DIMM	1	3		5		7	8	9	10	11	12	
19 DIMM	1	3		5		7	8	9	10	11	12	
20 DIMM	1	3	4	5	6	7	8	9	10		12	
21 DIMM	1	3	4	5	6	7	8	9	10		12	
22 DIMM	1	3	4	5	6	7	8	9	10	11	12	
23 DIMM	1	3	4	5	6	7	8	9	10	11	12	
24 DIMM	1	2	3	4	5	6	7	8	9	10	11	12

CPU1 slot number											
						8					
						8		10			
						8		10			
						8		10		12	
						8		10		12	
		3		5		8		10			
		3		5		8		10			
		3		5		8		10		12	
		3		5		8		10		12	
1		3		5		8		10		12	
1		3		5		8		10		12	
1		3		5		7	8		10		12
1		3		5		7	8		10		12
		3	4	5	6	7	8	9	10		
		3	4	5	6	7	8	9	10		
1		3		5		7	8	9	10	11	12
1		3		5		7	8	9	10	11	12
1		3	4	5	6	7	8	9	10		12
1		3	4	5	6	7	8	9	10		12
1		3	4	5	6	7	8	9	10	11	12
1		3	4	5	6	7	8	9	10	11	12
1	2	3	4	5	6	7	8	9	10	11	12
1	2	3	4	5	6	7	8	9	10	11	12

Depends on the combination of DIMM, DIMM expansion order differs. Select DIMM which can be mixed from the following combination list and install them in the order from larger capacity DIMM to small slot number. Mountable DIMM cannot be mixed with the combination. DIMM can be mixed only with the following combination.

N Code	N8102-						
	708	714	709	710	711	712	713
N8102-708, 8GB/R, 1R	✓	✓	✓	✓	✓		
N8102-714, 8GB/R, 2R	✓	✓	✓	✓	✓		
N8102-709, 16GB/R, 1R	✓	✓	✓	✓	✓		
N8102-710, 16GB/R, 2R	✓	✓	✓	✓	✓		
N8102-711, 32GB/R, 2R	✓	✓	✓	✓	✓		
N8102-712, 64GB/LR, 4R						✓	
N8102-713, 128GB/3DS, 8R							✓

✓: Allowed to be install together

Memory processor compatibility information

Memory clock frequency

Operating frequency of DDR4 memory varies by processor type and memory configuration.

Please refer to the table below for the actual maximum operating frequency.

CPU brand	Operating frequency driving voltage 1.2 V
Xeon® Platinum 8100 Series	2666MHz
Xeon® Gold 6100 Series	
Xeon® Gold 5122 Processor	
Xeon® Gold 5100 Series (except Xeon® Gold 5122 processor)	2400MHz
Xeon® Silver 4100 Series	
Xeon® Bronze 3100 Series	2133MHz

The operation memory speed is decided by rating DIMM speed, DIMM attached on each channel, processor model and speed selected on System Utility.

The maximum memory capacity

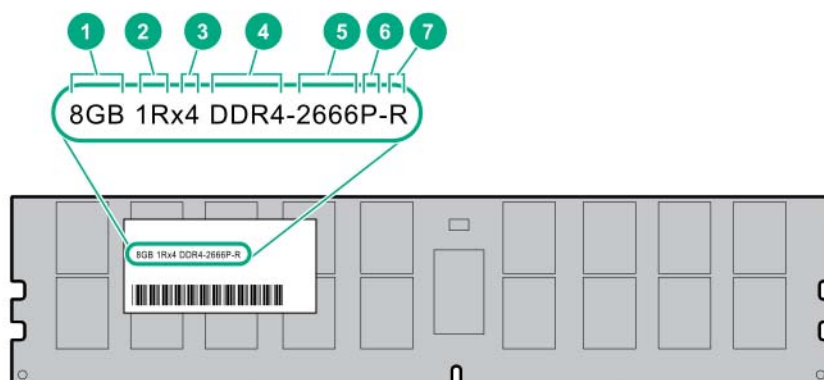
Maximum memory capacity depends on DIMM capacity, the number of installed DIMM, memory type, and the number of processors installed.

The maximum memory capacity

N code	DIMM type	DIMM rank	Capacity (GB)	1CPU (GB)	2CPU (GB)
N8102-708	RDIMM	Single	8	96	192
N8102-714	RDIMM	Dual	8	96	192
N8102-709	RDIMM	Single	16	192	384
N8102-710	RDIMM	Dual	16	192	384
N8102-711	RDIMM	Dual	32	384	768
N8102-712	LRDIMM	Quad	64	768	1536
N8102-713	3DS LRDIMM	Octal	128	1536	3072

### 1.11.3 Checking DIMM

To check out the features of the DIMM, please refer to the label affixed to the DIMM, the following illustrations and tables.

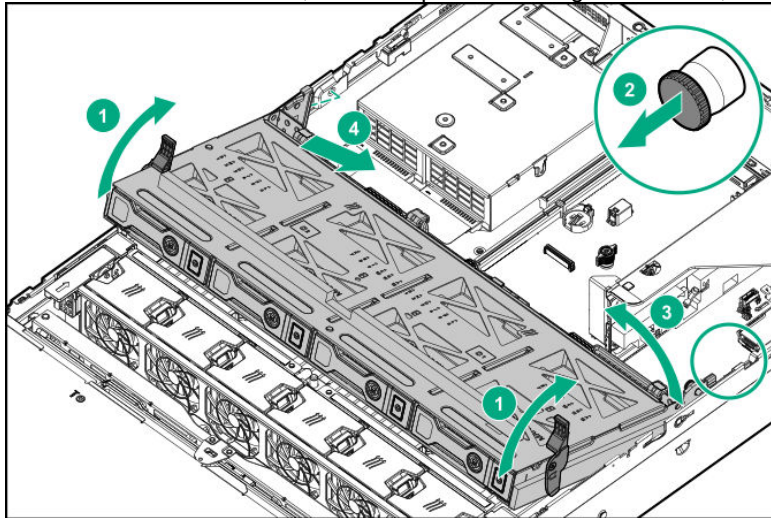


Number	Description	Meaning
1	Capacity	8GB 16GB 32GB 64GB 128GB
2	Rank	1R = Single rank 2R = Dual rank 4R = Quad rank 8R = Octal rank
3	DRAM data width	X4 = 4 bit X8 = 8 bit X16 = 16 bit
4	Memory generation	DDR4
5	The maximum speed of the memory	2133 MT/s 2400 MT/s 2666 MT/s
6	CAS latency	P = CAS 15-15-15 T = CAS 17-17-17 U = CAS 20-18-18 V = CAS 19-19-19 (for RDIMM, LRDIMM) V = CAS 22-19-19 (for 3DS TSVLRDIMM)
7	DIMM type	R = RDIMM (with register) L = LRDIMM (low loading) E = Unbuffered ECC (UDIMM)

### 1.11.4 Installation

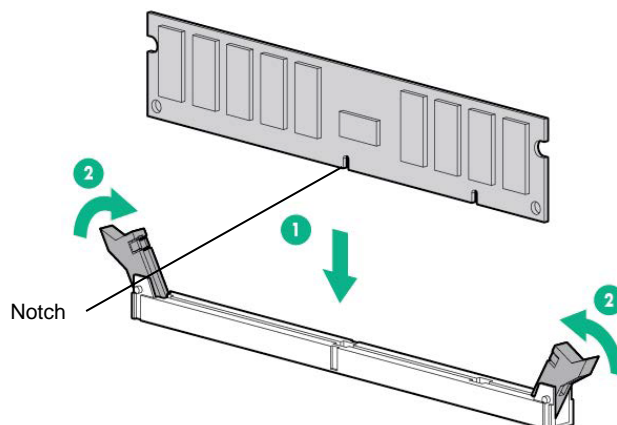
Follow the steps below to install a DIMM.

1. See steps 1 to 7 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. For the 3.5-inch drive model, if the mid-plane drive cage is attached, it must be removed.



3. Open levers on left and right sides of DIMM slot.
4. Push the DIMM straight into the slot.

When a DIMM is inserted into the slot, the lever automatically closes.



#### Important

- Make sure the orientation of the DIMM. The DIMM has a notch, preventing being incorrectly inserted.
- Do not apply too much pressure when you push a DIMM into the slot. Doing so can damage the socket or terminal part.

5. Continue to install/remove the internal options.
6. See *Chapter 2 (1.33 Attaching the air baffle)* to attach the air baffle.
7. Refer to *Chapter 2 (1.34 Installing Top Cover)* in this manual to replace the top cover of the server.

#### Note

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

8. Refer to *Chapter 2 (2 Installation and Connection)* in this manual to install/connect and turn the power ON.
9. Confirm that no error messages are displayed in POST screen.
10. Configure memory mode using RBSU of System Utility.  
Regarding the trouble shooting on a malfunctioning DIMM or the information on LEDs, see “(4) Status LED Panel combined LED descriptions”.

### 1.11.5 Removal / Replacement

---

To replace or remove DIMM, follow these steps.

To remove DIMM, reverse the installation procedure.

Be sure to install dummy cover to the slots from where DIMMs are removed.

**Note**

When removing a defective DIMM, check error messages displayed at POST or NEC ESMPRO and check the DIMM socket where the defective DIMM is installed.

Please check if there is no error on POST after replacing/removing DIMM.

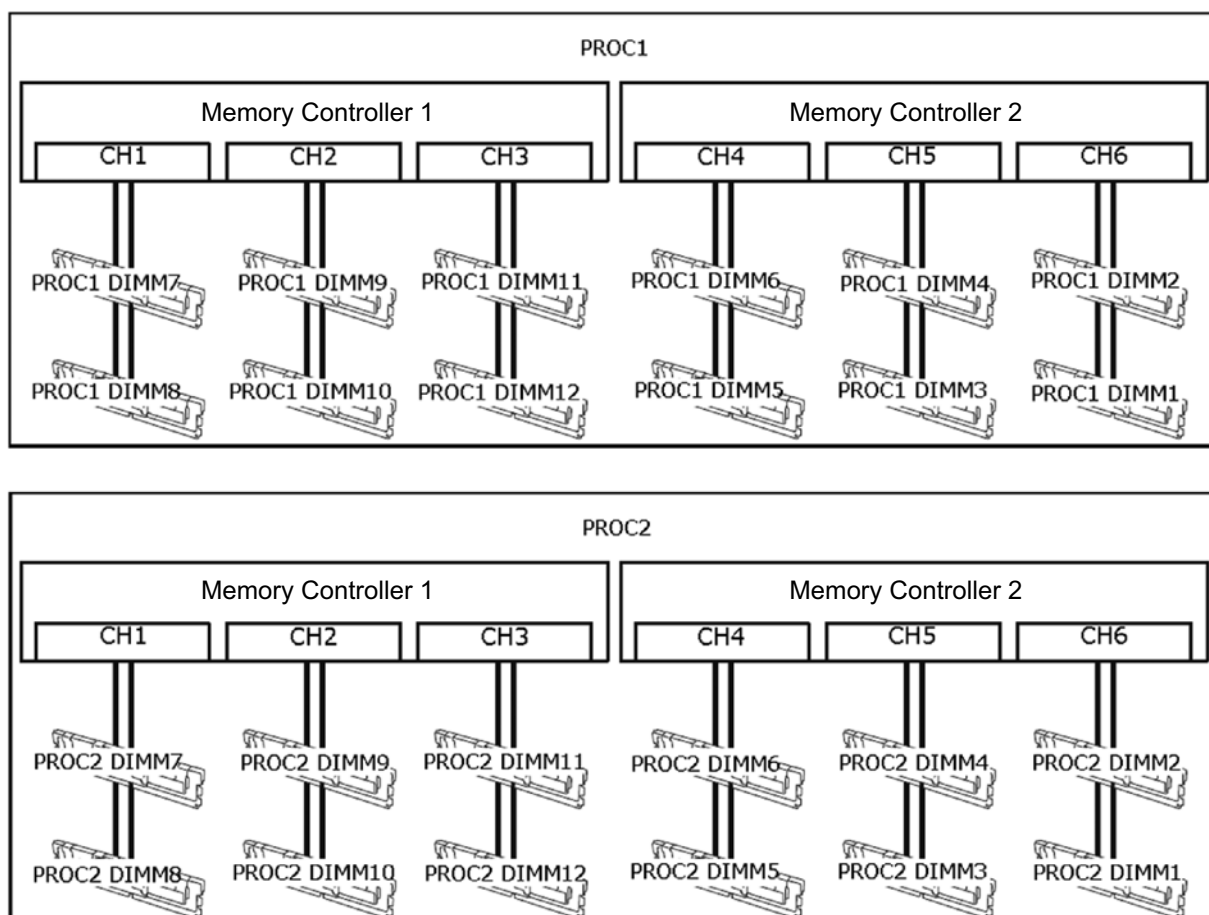


### 1.11.6 Memory Function

The device has, as Memory RAS function, "Advanced ECC Function (x4 SDDC)", "Memory Mirroring Function" and "Memory Sparing Function", "Fault tolerant memory function (ADDDC)".

Single Device Data Correction (SDDC) is a function to restore the data automatically in case one of memory chips stored on DIMM breaks.

The motherboard of this device has six systems of "Memory Channel", which controls memory.

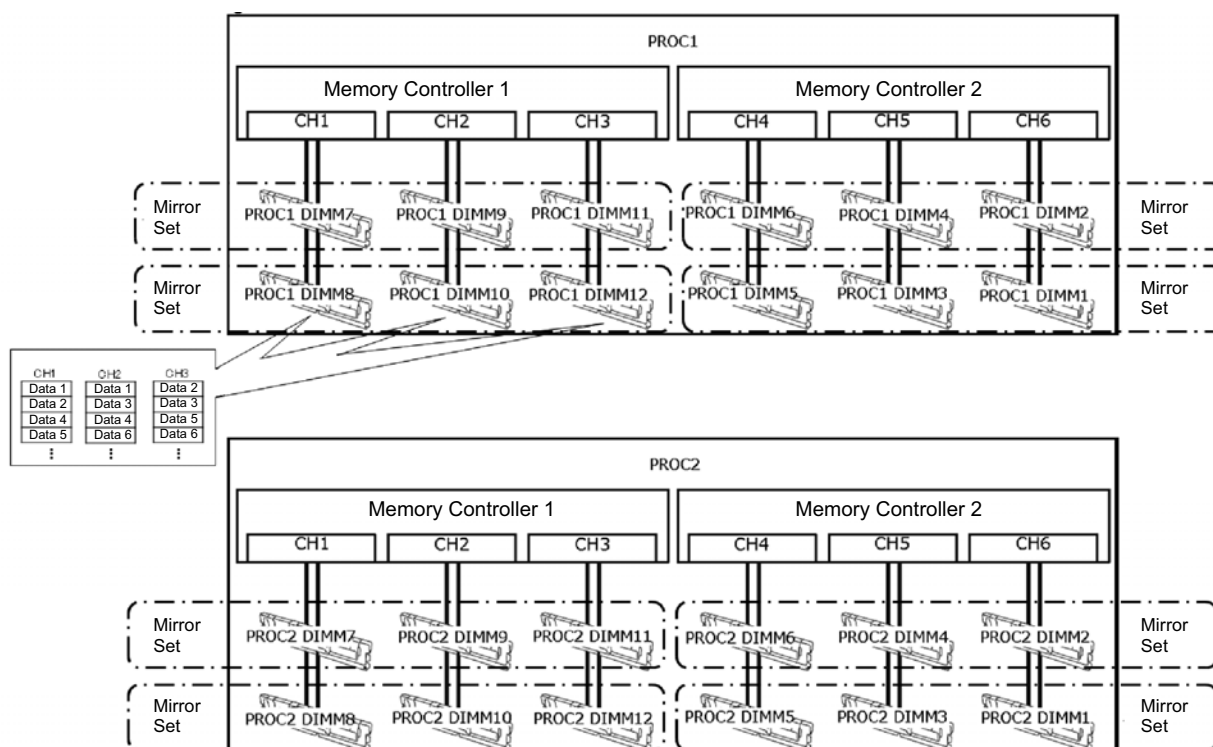


"Memory Mirroring Function" and "Memory Sparing Function" are functions to retain redundancy by monitoring of memories and switching among channels.

## (1) Memory Mirroring Function

Memory Mirroring Function is a function to generate redundancy by writing the same data into DIMM group (mirror set) composed of three channels under the same memory controller (channel1, channel 2 and channel 3 or channel 4, channel 5 and channel 6).

Ex: Configuration with 2 CPUs



### Tips

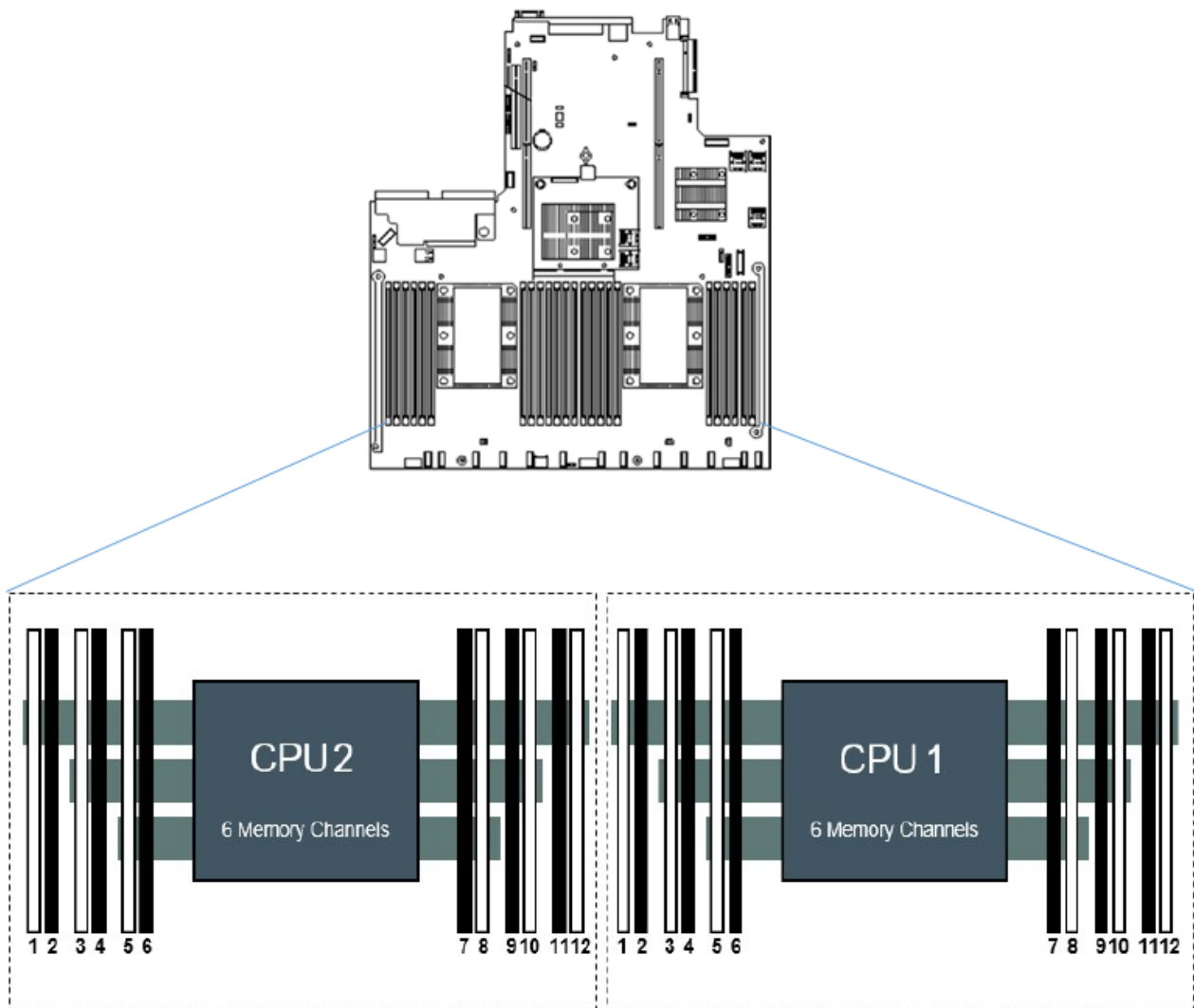
When Memory Mirroring Function is effective and "Memory Mirroring Mode" is set to "Full Mirroring," total 50 % of available memory can be used from the operating system.

The followings are the conditions to use this function.

- Install 12 DIMMs per CPU.
- Use DIMMs with the same product number for the device.
- Change the following parameters and save them.

From system utility, set "System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Memory Operations > Advanced Memory Protection" to "Mirrored Memory with Advanced ECC Support".

- After rebooting, confirm that "Advanced Memory Protection Mode : Memory Mirroring with Advanced ECC" is displayed in POST.



The following mirroring cannot be configured.

- Memory mirroring in the same memory channel

**Note**

- When using Memory Mirroring Function, install 12 DIMMs per CPU.
- Use memories with the same product number for the device.
- Partial Mirror supports only Gold5100 series /Gold6100 series /Platinum8100 series of Intel Xeon processor.

**Notes for the setting of memory mirroring**

Even if "Mirrored Memory with Advanced ECC Support" is set in "Advanced Memory Protection" and Memory Mirroring Configuration is selected, in case DIMM configuration that cannot constitute memory mirroring due to expansion or removal of DIMM is detected, "Advanced Memory Protection" operates as "Advanced ECC" configuration.

In this case, "Advanced ECC" is displayed in POST's "Advanced Memory Protection Mode".

IML also records the relevant error events.

**Notes for replacements at failure**

At the time of failure, identify damaged DIMM(s) from IML and replace DIMM(s) one by one.

(2) Memory Sparing Function

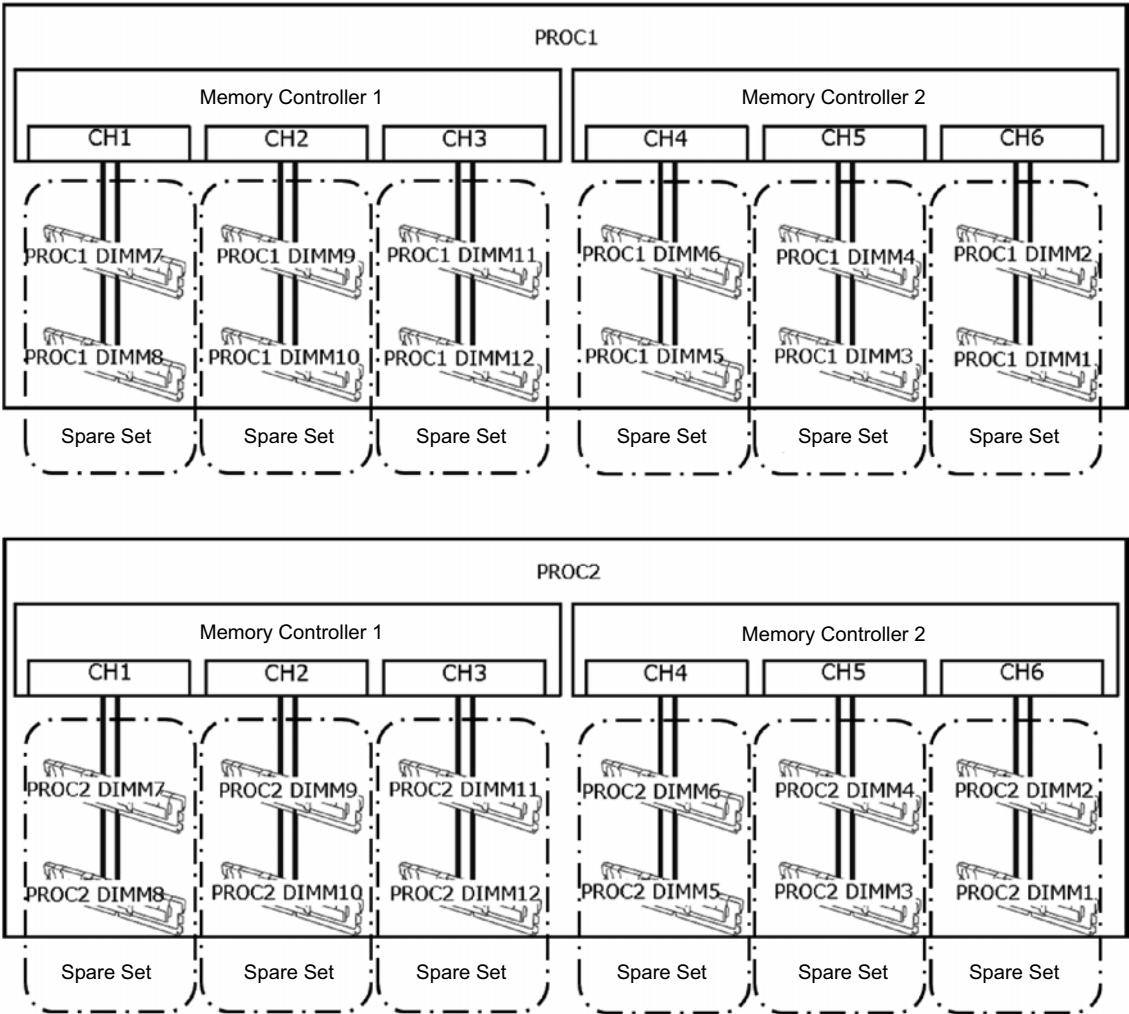
By making a rank of DIMM stored in the memory channel under a memory controller of each CPU stand by as a spare, Memory Sparing Function makes processing continue by making the DIMM standing by perform the task automatically in case a correctable error occurs in a DIMM under the memory channel in operation.

Tips

From the operating system, a size smaller than that is really installed is recognized (it changes depending on the number of DIMM installed and the capacity per one).

For the physical memory capacity available from the operating system, refer to the table below.

The number of CPU	The number of memory	Types of on-board memory						
		8GB (SR)	8GB (DR)	16GB (SR)	16GB (DR)	32GB (DR)	64GB (QR)	128GB (OR)
1	8	32GB	48GB	64GB	96GB	192GB	448GB	768GB
	12	48GB	72GB	96GB	144GB	288GB	672GB	1152GB
2	16	64GB	96GB	128GB	192GB	384GB	896GB	1536GB
	24	96GB	144GB	192GB	288GB	576GB	1344GB	2304GB



The followings are the conditions to use this function.

- Use DIMMS with the same product number for the device.
- Mount DIMMs in the DIMM slot constituting a spare set.
- Change the following parameters and save them.

From System Utility, set "System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Memory Operations > Advanced Memory Protection" to "Online Spare with Advanced ECC Support".

- After rebooting, confirm "Advanced Memory Protection Mode : Online Spare with Advanced ECC" is displayed in POST.

The following memory sparrings cannot be constructed.

- Mounting DIMMs with different product numbers on the spare set
- Memory sparing between different memory channels

#### Note

- When using Memory Mirroring Function, install 12 DIMMs per CPU.
- Use memories with the same product number for the device.

#### Notes for the configuration of memory sparing

Even if you set "Advanced Memory Protection" to "Online Spare with Advanced ECC Support" and select memory sparing configuration, in case DIMM configuration which cannot constitute memory sparing due to expansion or removal of DIMM is detected, "Advanced Memory Protection" operates as "Advanced ECC".

In this case, "Advanced ECC" is displayed in POST's "Advanced Memory Protection Mode".

IML also records the relevant error events.

#### Notes for replacements at failure

At the time of failure, identify damaged DIMM(s) from IML and replace DIMM(s) one by one.

### (3) Fault tolerant memory function (ADDDC)

In case of failures in two chips of more than one memory and chip that are mounted in DIMM, the fault tolerant function (ADDDC) automatically recovers the data and enables the system to continuously run.

#### Tips

Mount DIMM according to 1.10.2 Procedure for adding DIMM.  
The operation system recognizes as the same size as the one actually mounted.

The conditions to use this function are described below.

- Change the following parameters and save the settings.  
From the System Utilities, select "System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Memory Operations to set Advanced Memory Protection" to "Fault Tolerant Memory (ADDDC)".
- After restarting, check that "Advanced Memory Protection Mode: Fault Tolerant Memory (ADDDC)" appears on POST.

**Note**

- To use the fault tolerant function (ADDDC), use the x4 DRAM memory.
- Mount the memory so that the total number of RANK for each channel is 2 or higher.
- When using the memory ADDDC function, install DIMM 8 or DIMM 12 per CPU.
- DIMM with the practicable ADDDC function is "N8102-711", "N8102-712" and "N8102-713".
- Please choose identical part number as the memory installed in this server.

**Cautions for setting the fault tolerant memory (ADDDC)**

If the DIMM configuration that cannot allow the fault tolerant (ADDDC) configuration is detected while "Fault Tolerant Memory (ADDDC)" is set to "Advanced Memory Protection" and the fault tolerant (ADDDC) configuration is specified, the "Advanced ECC" setting is enabled when "Advanced Memory Protection" runs.

In this case, "Advanced ECC" appears in "Advanced Memory Protection Mode:" of POST.

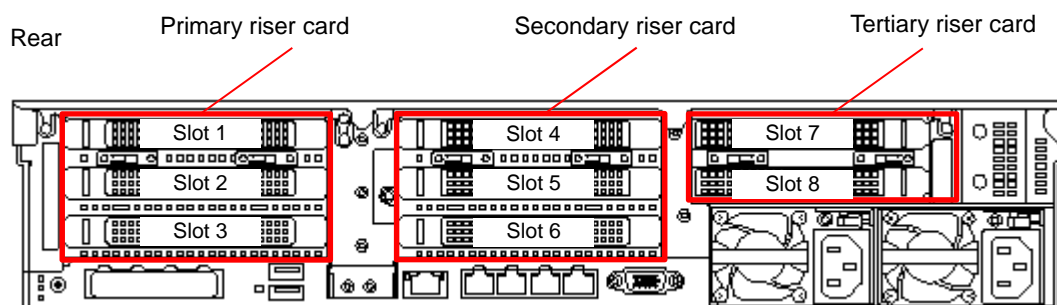
In addition, the related error events are recorded in IML.

**Cautions for replacement of DIMM due to a failure**

In case of a failure, identify the faulty DIMM from IML, and replace DIMM in a unit of one piece of DIMM.

## 1.12 Riser Card

The device is a highly expandable one equipped with “Primary Riser Card” to which 3 PCI boards (Slot 1/2/3) can be fit, “Secondary Riser Card” to which 3 PCI boards (Slot 4/5/6) can be fit and “Tertiary Riser Card (Butterfly Riser)” to which 2 PCI boards (Slot 7/8) can be fit. Moreover, we offer various types of riser cards and so you can change the combination according to your purpose.



### Important

You must avoid static electricity to work with the procedure below. For details, see *Chapter 1 (1.8 Anti-static Measures)* in *Safety Precautions and Regulatory Notices*.

### 1.12.1 Notes

Read the following notes when installing or removing a riser card.

- Do not touch the terminals of the riser cards and the leads of electronic components with your bare hand. Fingerprints and dust left on them cause the server to malfunction due to a connection failure or damage to the leads.
- Available type of PCI card depends on the type of a riser card. Make sure the card type before connecting it to riser card.

### 1.12.2 Installing Primary Riser Card

Please prepare the following before installing the options.

- Parts included in the option kit

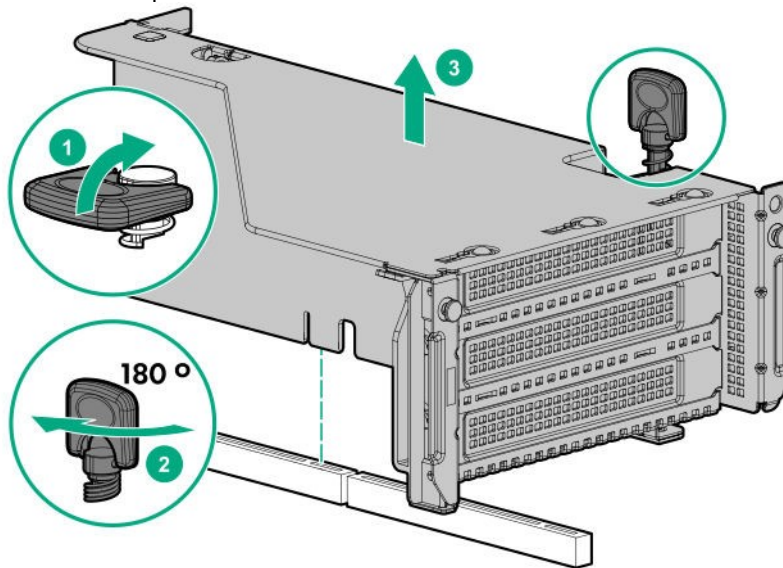
### Note

In order to prevent the damage to server's main body or the expansion board, please remove all the AC power cables before removing/installing riser card.

To install the components, follow these steps.

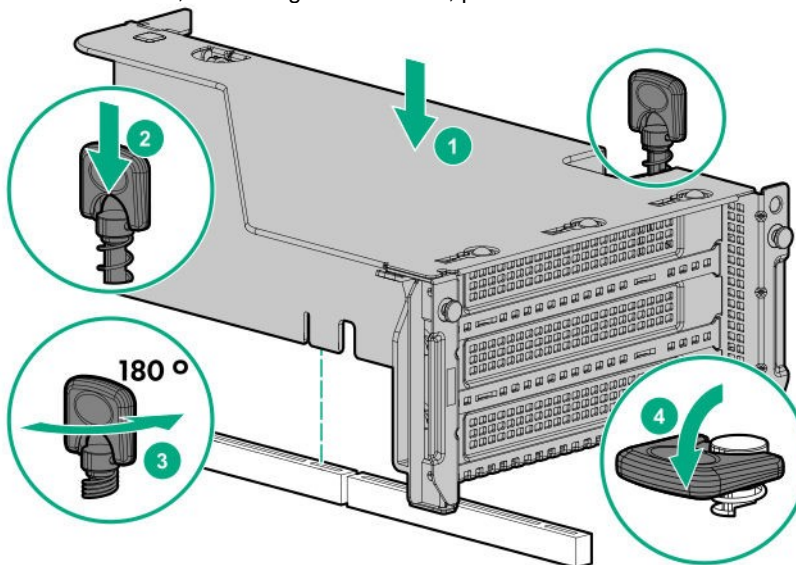
1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.

2. Raise the screw handles located on the upper part of the riser card and turn it 180° to the left. Then, pull the riser card up to remove it.



3. Adjust the position of the riser card edge of the riser card to the position of the connector, and push it in place from above.

Raise the screw handles at the top of riser card, turn the screws to the right 180 degrees while pressing them down. Then, after fixing the riser card, put down the screw handles as before.



4. See Chapter 2 (1.34 Installing Top Cover) to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

5. Please see Chapter 2 (2 installation and connection) in this manual to conduct installation and connection, and turn the power supply ON.



### 1.12.3 Installing Secondary Riser Card

Please prepare the following before installing the options.

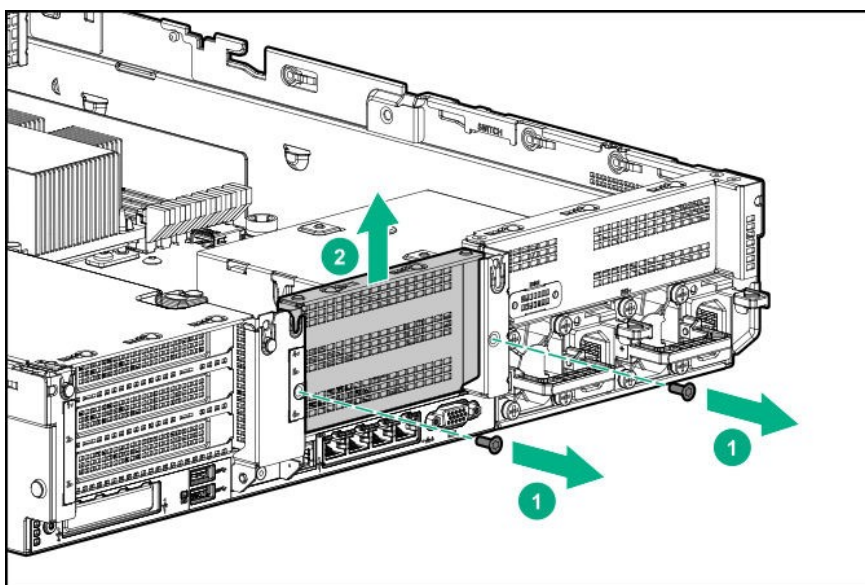
- Parts included in the option kit
- T-10 hexalobular driver

**Note**

In order to prevent the damage to server's main body or the expansion board, please remove all the AC power cables before removing/installing riser card.

To install the components, follow these steps.

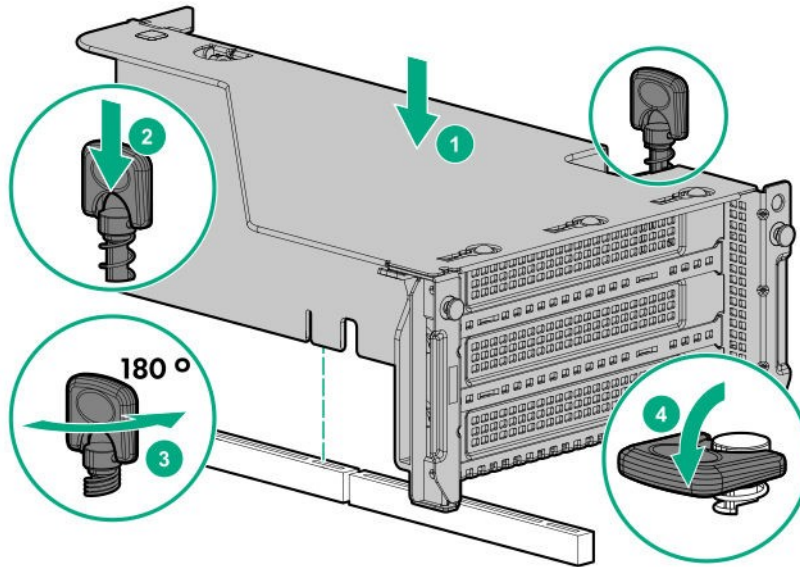
1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Unfasten two screws securing the rear blank cover, and pull up the blank cover to remove it.

**Note**

Keep each removed blank covers.

- Adjust the position of the riser card edge of the secondary riser card to the position of the connector, and push it in place from above.

Raise the screw handles located on the upper part of the riser card and push it downwards while turning it 180° to the right to fix the riser card in place. Then, return the screw handles to their original positions.



- See Chapter 2 (1.34 Attaching the air baffle) to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

- Please see Chapter 2 (2 Installation and Connection) in this manual to conduct installation and connection, and turn the power supply ON.

### 1.12.4 Installing Tertiary Riser Card

Please prepare the following before installing the options.

- Parts included in the option kit
- T-10 hexalobular driver

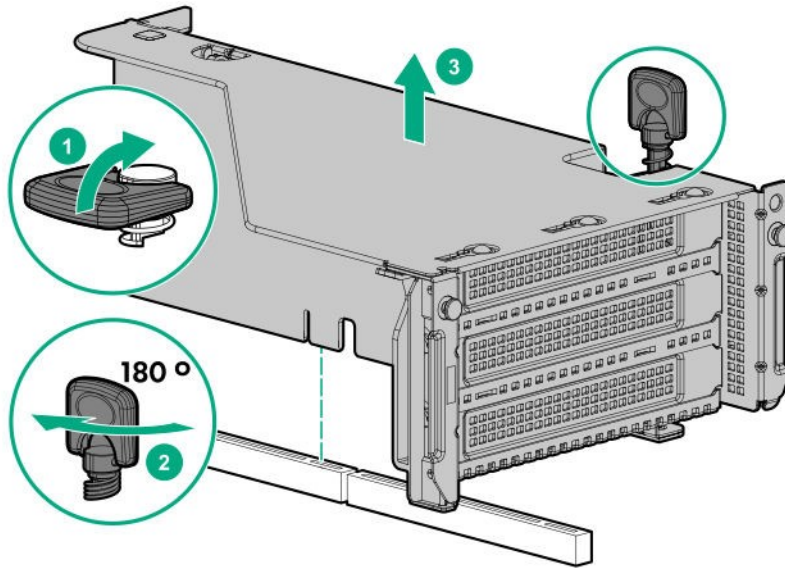
**Note**

In order to prevent the damage to server's main body or the expansion board, please remove all the AC power cables before removing/installing riser card.

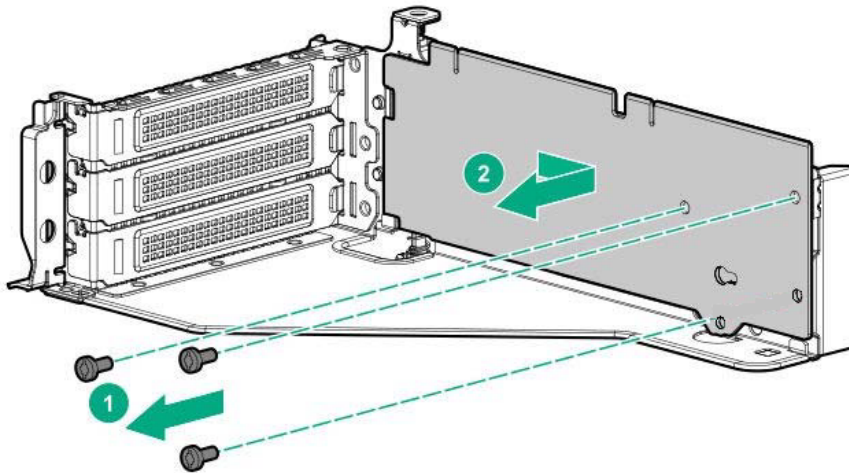
To install the components, follow these steps.

- See steps 1 to 6 in Chapter 2 (1.2 Overview of Installation and Removal) for preparations.

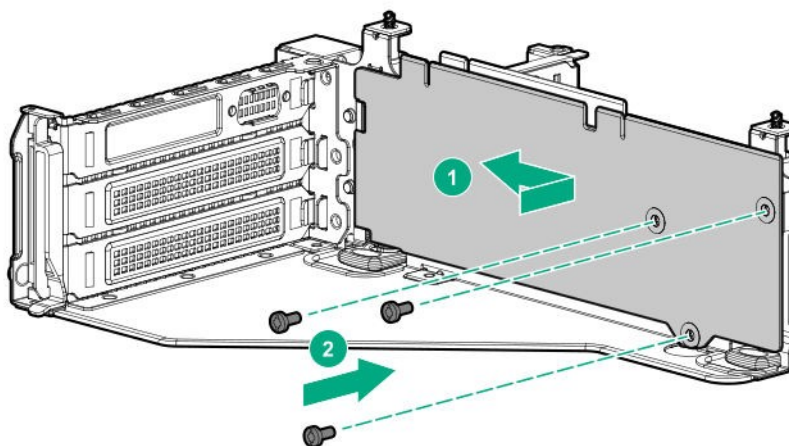
2. If the secondary riser card is not attached, proceed to step 5. If it is attached, raise the screw handles at the top of riser card, turn them to the left 180 degrees, and then pull up the riser card to remove the riser card.



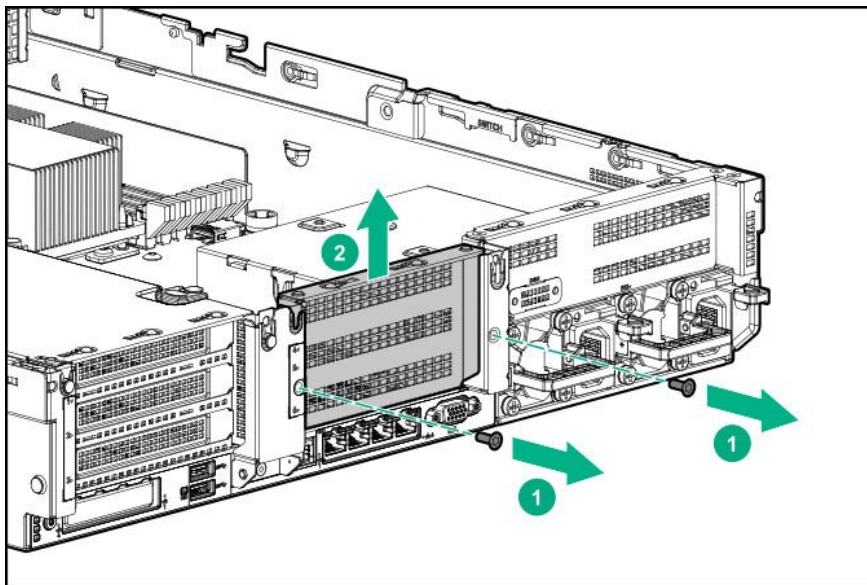
3. Unfasten 3 screws and remove secondary riser card.



4. Attach the secondary riser card removed in step 3 to secondary side of tertiary riser card (butterfly riser card), and fasten with 3 screws. After that, proceed to step 6.

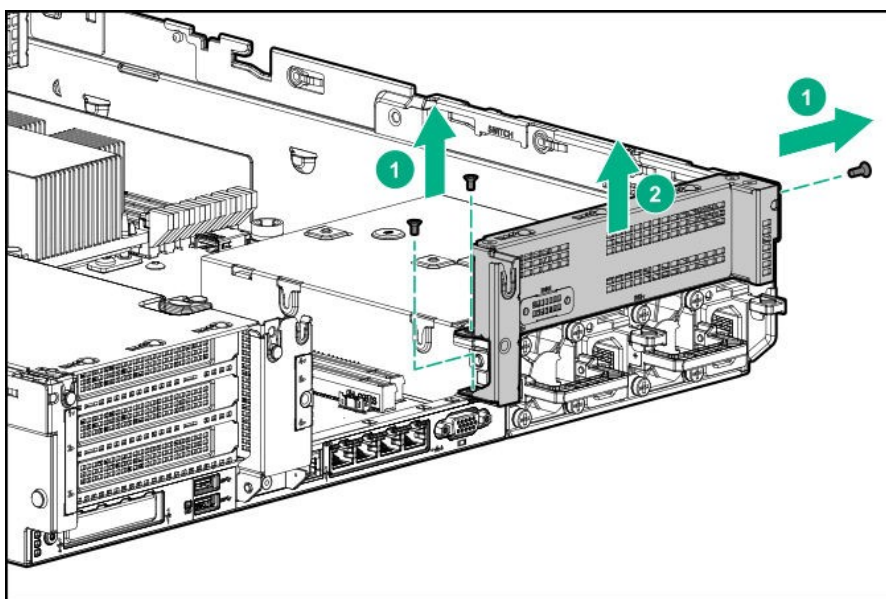


5. Remove the 2 screws that fix the secondary riser blank cover in place, and remove the cover by lifting it up.

**Note**

Keep each removed blank covers.

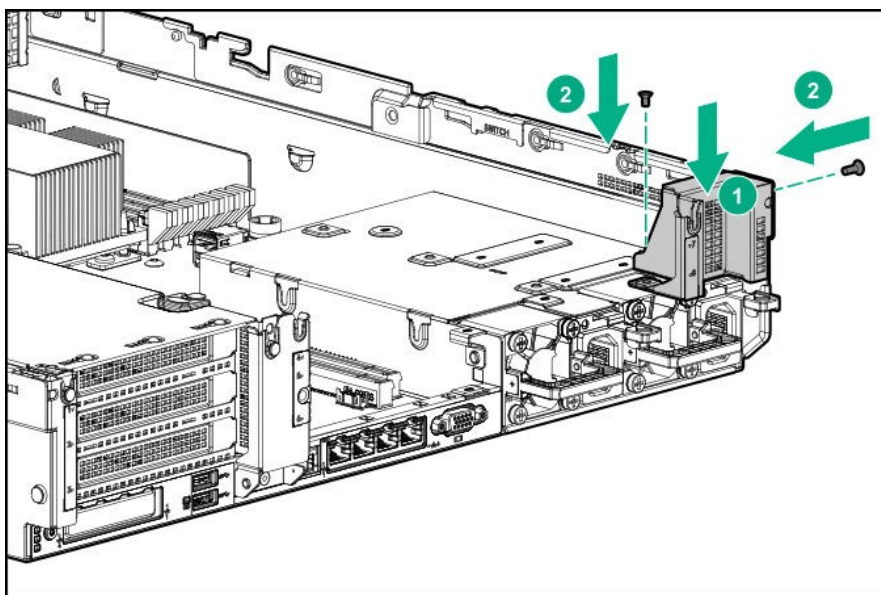
6. Remove the 3 screws that fix the tertiary riser blank cover in place, and remove the cover by lifting it up.

**Note**

Keep each removed blank covers.

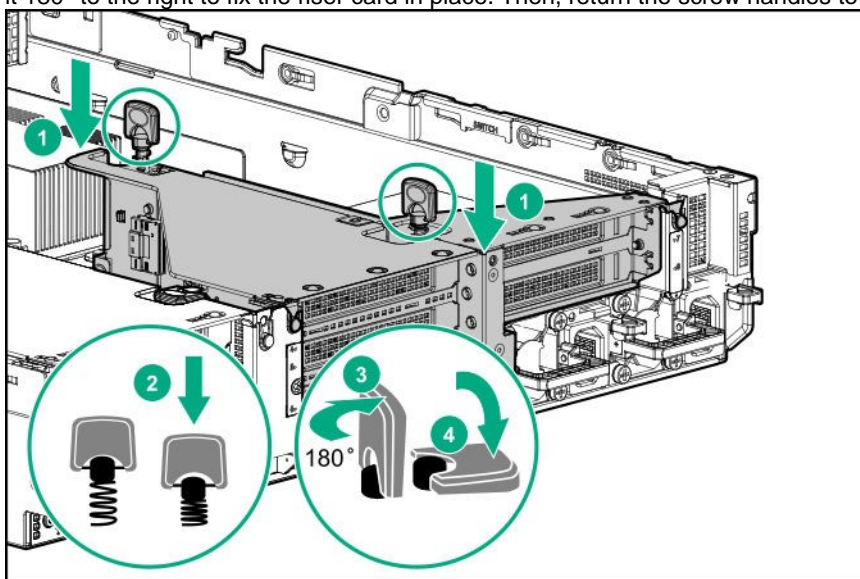


7. Take out a rear blank from the option kit, fit the blank cover from the upper direction and fix it with two screws.



8. Adjust the position of the riser card edge of the tertiary riser card to the position of the connector, and push it in place from above.

Raise the 2 screw handles located on the upper part of the riser card and push it downwards while turning it 180° to the right to fix the riser card in place. Then, return the screw handles to their original positions.



9. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

#### Note

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server without implementing any of component or blank on all of drive bays and device bays.

10. Please see *Chapter 2 (2 Installation and connection)* in this manual to conduct installation and connection, and turn the power supply ON.

### 1.12.5 Removal

The procedure for removal is the reverse of installation.

Re-attach the blank cover if you operate without it attached.

**Important** Re-attach the blank cover removed to maintain the internal cooling.

### 1.12.6 Installing M.2 SATA SSD media

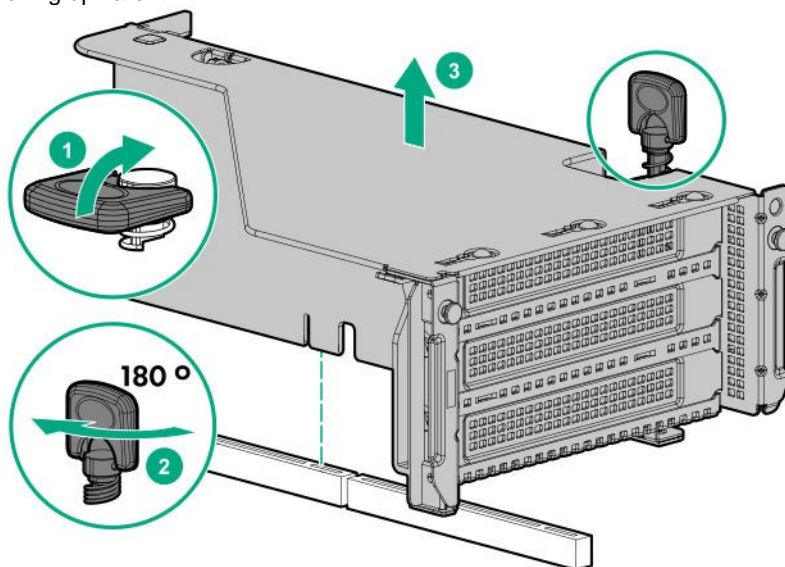
**Note** In order to prevent the damage to electronic components, please start to install the system after conducting the appropriate anti-static treatment. There is a possibility of causing electrostatic discharge if appropriate grounding wire treatment is not conducted.

Please prepare the following before installing the options.

- Parts included in the option kit
- Phillips screwdriver

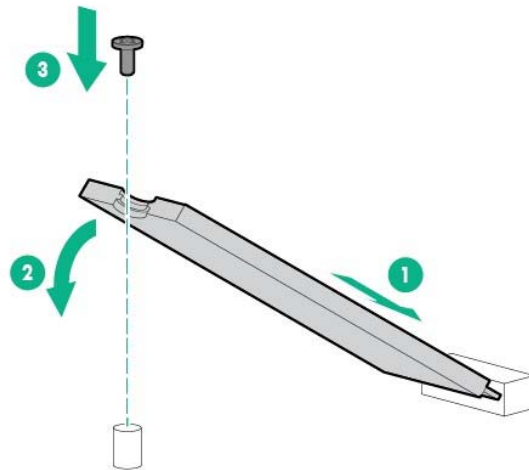
To install the components, follow these steps.

1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Raise the screw handle on the riser card and turn 180 degrees to the left, then remove the riser card by pulling upward.

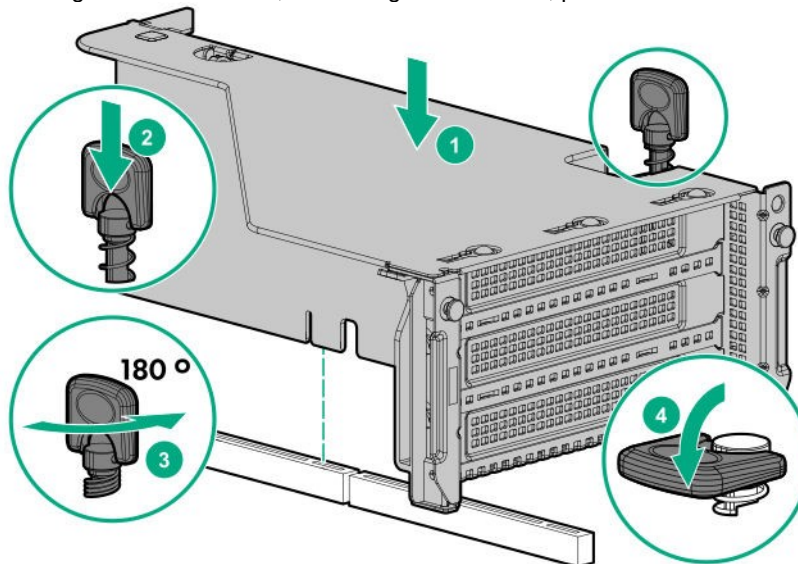


3. Attach the stud and fixing parts to the slotted hole of the riser card that for fixing M.2 SSD media.

4. Insert the edge of M.2 SSD media to connector, take down the media to the stud attached in step 3, and then fix with a screw.



5. Fit the riser card edge of primary riser card to the position of connector and push the edge into the connector from above. Raise the screw handles at the top of riser card, turn the screws to the right 180 degrees while pressing them down. Then, after fixing the riser card, put down the screw handles as before.



6. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

7. Please see *Chapter 2 (2 Installation and connection)* in this manual to conduct installation and connection, and turn the power supply ON.

### 1.12.7 Removing M.2 media

The procedure for removal is the reverse of installation.

## 1.13 PCI board

The device is equipped with “Riser Cards (3 types)” to which a PCI board can be fit, “LOM Card dedicated Slot” to which an LOM Card can be fit, and “RAID Controller dedicated Slot” to which a RAID controller can be fit. 8 full-height PCI boards can be fit to riser card, one LOM card can be fitted to LOM Card dedicated Slot, and one RAID Controller can be fit to RAID Controller dedicated Slot. (In total, 10 PCI boards can be installed.) Before installing an option, prepare the followings.

**Important** To avoid static electricity, see Chapter 1 (1.8 Anti-static Measures) in Safety Precautions and Regulatory Notices. Ask your sales representative if you want to remove the TPM kit.

**Note** In order to prevent the damage to server's main body or the expansion board, please remove all the AC power cables before removing/installing riser card.

All slots support full-height PCI cards. Use the PCI card length according to the table below.

• Primary riser connector

Slot	PCIe type	3 slots riser*	2 slots riser
1	Full-length/Full-height (FL/FH)	PCIe3 x16 (8,4,2,1)	—
2	Half-length/Full-height (HL/FH)	PCIe3 x16 (8,4,2,1)	PCIe3 x16 (16,8,4,2,1)
3	Half-length/Full-height (HL/FH)	PCIe3 x8 (8,4,2,1)	PCIe3 x8 (8,4,2,1)

\*: This server is shipped with the card is equipped on the primary riser card and connected to the connector of the body.

• Secondary riser connector

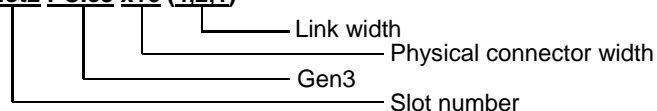
Slot	PCIe type	3 slots riser
4	Full-length/Full-height (FL/FH)	PCIe3 x16 (16,8,4,2,1)
5	Half-length/Full-height (HL/FH)	PCIe3 x16 (16,8,4,2,1)
6	Half-length/Full-height (HL/FH)	PCIe3 x8 (8,4,2,1)

• Tertiary riser connector

Slot	PCIe type	2 slots riser
7	Full-length/Full-height (FL/FH)	PCIe3 x16 (16,8,4,2,1)
8	Half-length/Full-height (HL/FH)	PCIe3 x16 (16,8,4,2,1)

**Example of slot description**

**Slot2 PCIe3 x16 (4,2,1)**





### 1.13.1 Notes

Read the following notes when installing or removing a PCI board.

- Do not touch the terminals of the PCI board and the leads of electronic components with your bare hand. Fingerprints and dust left on them cause the server to malfunction due to a connection failure or damage to the leads.
- Available type of PCI card depends on a riser card. Make sure the card type before connecting it to riser card.

### 1.13.2 Supported cards and available slots

The following tables list supported cards and slots available for them. For details of the features of each card, see the manual supplied with the card.

#### Tips

- Different cards mounted on the same bus operate at the lower frequency.
- If the operation performance of PCI card differs from that of PCI Slot, the PCI card operates at lower frequency.

#### (1) List of slots mounting board

Part number	Part name	Riser card name	RAID	LOM	1st riser card *3						2nd riser card *3						3rd riser card*3				Remarks
		Slot number	—	—	SLOT1	SLOT2	SLOT3	SLOT4	SLOT5	SLOT6	SLOT7	SLOT8									
		CPU connected	CPU1						CPU2												
		PCI standard	PCIe3.0																		
		PCI slot performance *1	x8	x8	x8	x16	x8	x16	x8	x16	x8	x16	x8	x16	x8	x16	x8				
		Bandwidth/lane *1	8Gb/s																		
		PCI board type *2	—	—	x8	x16	x8	x16	x8	x16	x8	x16	x8	x16	x8	x16	x8				
		Slot size	Dedicated to RAID	Dedicated to LOM	FH	FH	FH	FH	FH	FH	FH	FH	FH	FH	FH	FH	FH				
		Available size			FL	FL	HL	HL	HL	HL	FL	FL	HL	HL	HL	FL	FL	HL			
N8103-189	RAID Controller (0MB, RAID 0/1) [PCI Express 3.0(x8)]	○	—	—	—	—	—	—	—	—	—	—	—	—	—						
N8103-190	RAID Controller (2GB, RAID 0/1/5/6) [PCI Express 3.0(x8)]	○	—	—	—	—	—	—	—	—	—	—	—	—	—	Maximum of up to 1 battery per device					
N8103-191	RAID Controller (4GB, RAID 0/1/5/6) [PCI Express 3.0(x8)]	○	—	—	—	—	—	—	—	—	—	—	—	—	—	Maximum of up to 1 battery per device					
N8103-195	RAID Controller (0MB, RAID 0/1) [PCI Express 3.0(x8)]	—	—	1	3	5	2	4	6	7	8										
N8103-201	RAID Controller (2GB, RAID 0/1/5/6) [PCI Express 3.0(x8)]	—	—	1	3	5	2	4	6	7	8					Maximum of up to 1 battery per device					
N8103-196	RAID Controller (2GB, RAID 0/1/5/6) [PCI Express 3.0(x8)]	—	—	1	3	5	2	4	6	7	8					For external device. Maximum of up to 1 battery per device					
N8103-197	SAS Controller (2ch) [PCI Express 3.0(x8)]	—	—	1	3	5	2	4	6	7	8					For external device					
N8104-171	1000BASE-T LOM Card (4ch) [PCI Express 2.0(x8)]	—	○	—	—	—	—	—	—	—	—	—	—	—	—						
N8104-172	1000BASE-T LOM Card (4ch) [PCI Express 3.0(x8)]	—	○	—	—	—	—	—	—	—	—	—	—	—	—						
N8104-173	10GBASE-T LOM Card (2ch) [PCI Express 3.0(x8)]	—	○	—	—	—	—	—	—	—	—	—	—	—	—						
N8104-175	10GBASE-T LOM Card (2ch) [PCI Express 2.0(x8)]	—	○	—	—	—	—	—	—	—	—	—	—	—	—						
N8104-176	10GBASE LOM Card (SFP+/2ch) [PCI Express 3.0(x1)]	—	○	—	—	—	—	—	—	—	—	—	—	—	—						
N8104-177	25GBASE LOM Card (SFP28/2ch)	—	○	—	—	—	—	—	—	—	—	—	—	—	—						
N8104-178	1000BASE-T Card (2ch) [PCI Express 2.0(x1)]	—	—	1	3	5	2	4	6	7	8										
N8104-179	1000BASE-T Card (4ch) [PCI Express 2.0(x4)]	—	—	1	3	5	2	4	6	7	8					Network cables with RJ-45 plug covers cannot be used.					
N8104-180	1000BASE-T Card (2ch) [PCI Express 2.0(x4)]	—	—	1	3	5	2	4	6	7	8					Network cables with RJ-45 plug covers cannot be used.					

Part number	Part name	Riser card name	RAID	LOM	1st riser card *3						2nd riser card *3						3rd riser card*3						Remarks	
		Slot number	—	—	SLOT1	SLOT2	SLOT3	SLOT4	SLOT5	SLOT6	SLOT7	SLOT8												
		CPU connected	CPU1						CPU2															
		PCI standard	PCIe3.0																					
		PCI slot performance *1	x8	x8	x8	x16	x8	x16	x8	x16	x8	x16	x8	x16	x8	x16	x8	x16	x8	x16				
		Bandwidth/lane *1	8Gb/s																					
		PCI board type *2	—	—	x8	x16	x8	x16	x8	x16	x8	x16	x8	x16	x8	x16	x8	x16	x8	x16				
		Slot size	Dedic ated to RAID	Dedic ated to LOM	FH	FH	FH	FH	FH	FH	FH	FH	FH	FH	FH	FH	FH	FH	FH	FH				
		Available size			FL	FL	HL	HL	HL	HL	FL	FL	HL	HL	HL	HL	FL	FL	HL	HL				
N8104-181	1000BASE-T Card (4ch) [PCI Express 2.0(x4)]	—	—	1	3	5	2	4	6	7	8	Network cables with RJ-45 plug covers cannot be used.												
N8104-182	10GBASE-T Card (2ch) [PCI Express 2.0(x8)]	—	—	1	3	5	2	4	6	7	8													
N8104-183	10GBASE-T interface board (2ch)	—	—	1	3	5	2	4	6	7	8													
N8104-184	10GBASE-T interface board (2ch)[PCI Express 3.0(x4)]	—	—	1	3	5	2	4	6	7	8													
N8104-187	25GBASE Interface basic board (SFP28/2ch)	—	—	1	3	5	2	4	6	7	8													
N8104-185	10GBASE Basic Card(SFP+/2ch) [PCI Express 2.0(x8)]	—	—	1	3	5	2	4	6	7	8													
N8104-186	10GBASE Basic Card(SFP+/2ch) [PCI Express 3.0(x8)]	-	-	1	3	5	2	4	6	7	8													
N8190-163	Fibre Channel controller (1ch) [PCI Express 3.0(x8)]	—	—	1	3	5	2	4	6	7	8	Can’ t mix with N8190-165/-166												
N8190-164	Fibre Channel controller (2ch) [PCI Express 3.0(x8)]	—	—	1	3	5	2	4	6	7	8	Can’ t mix with N8190-165/-166												
N8190-165	Fibre Channel Controller (1ch) [PCI Express 3.0(x8)]	—	—	1	3	5	2	4	6	7	8	Can’t mix with N8190-163/-164/-171/-172												
N8190-166	Fibre Channel Controller (2ch) [PCI Express 3.0(x8)]	—	—	1	3	5	2	4	6	7	8	Can’t mix with N8190-163/-164/-171/-172												
N8116-51	SAS Expander Card	—	—	1	3	5	2	4	6	7	8	Maximum of up to 1												
N8190-171	Fibre Channel controller (1ch) [PCI Express 3.0(x8)]	—	—	1	3	5	2	4	6	7	8	Can’ t mix with N8190-165/-166												
N8190-172	Fibre Channel controller (2ch) [PCI Express 3.0(x8)]	—	—	1	3	5	2	4	6	7	8	Can’ t mix with N8190-165/-166												
N8105-51	GPU Computing Card [PCI Express 3.0(x16)]	—	—	—	1	—	3	—	5	—	2	—	4	—	6	—	7	—	Up to 1					

● Standard Installation ○ Installation Available — Installation Not Available      The numbers stand for the order of installation.

\*1 The data transfer rate of PCI slot is calculated from a transfer band multiplied by the number of lanes.

<Ex.> x8 lanes = 64Gbps (one way)

\*2 Shows a connector size. Cards having the number of plugs or lower can be connected.

<Ex.> x8 Plug → x1card, x4card, or x8card can be fit in. x16card cannot be fit in.

- Refer to the technical guide for the detailed feature of each card.
- The contents inside brackets next to part names show card's own maximum performances.
- In case the performances are different between a PCI slot and a PCI board, the device operates on the lower performance.
- FH: Full height
- FL: Full length
- HL : Half length

\*3 Refer to the list of riser card slots for slot performance/ slot form of each slot.

\*4 We offer various types of riser cards. Depending on the types of riser cards, performance, form and support PCI card of a slot may be different. Check the compatibilities of PCI cards referring to the list of riser cards.

**(2) Riser Card List****1st riser card (PCIe3.0)**

Part number	SLOT1			SLOT2			SLOT3			Others		
	Slot performance *1	Slot form *2	Slot size	Slot performance *1	Slot form *2	Slot size	Slot performance *1	Slot form *2	Slot size	M.2 SATA SSD slot	PCIe SSD connector *3	GPU power connector
Standard installation	x8	x8	FH/FL	x16	x16	FH/HL	x8	x8	FH/HL	2 slots	—	—
N8116-64	x16	x16	FH/FL	x16	x16	FH/HL	—	—	—	—	—	—
N8116-66	—	—	—	x16	x16	FH/HL	x16	x16	FH/HL	—	—	Supported
N8116-60 4xPCIe SSD Riser	—	—	—	—	—	—	—	—	—	—	4	—
N8154-98 Rear 2.5-inch Drive Cage	—	—	—	—	—	—	x16	x16	FH/HL	—	—	—

**2nd riser card (PCIe3.0) [Optional]**

Part number	SLOT4			SLOT5			SLOT6			Others		
	Slot performance *1	Slot form *2	Slot size	Slot performance *1	Slot form *2	Slot size	Slot performance *1	Slot form *2	Slot size	M.2 SATA SSD slot	PCIe SSD connector *3	GPU power connector
N8116-56	x16	x16	FH/FL	x16	x16	FH/HL	—	—	—	—	—	—
N8116-58	—	—	—	x16	x16	FH/HL	x16	x16	FH/HL	—	—	—
N8116-62	x8	x8	FH/FL	x16	x16	FH/HL	x8	x8	FH/HL	—	—	Supported
N8116-67	—	—	—	x16	x16	FH/HL	x16	x16	FH/HL	—	—	Supported
N8116-79	x8	x8	FH/FL	x8	x8	FH/HL	x8	x8	FH/HL	—	—	—
N8116-80 8xPCIe SSD Riser	—	—	—	—	—	—	—	—	—	—	4	—
N8154-98 Rear 2.5-inch Drive Cage	—	—	—	—	—	—	x16	x16	FH/HL	—	—	—

**3rd riser card (PCIe3.0) [Optional]**

Part number	SLOT7			SLOT8			Others				
	Slot performance *1	Slot form *2	Slot size	Slot performance *1	Slot form *2	Slot size	M.2 SATA SSD slot	PCIe SSD connector *3	GPU power connector		
N8116-78	x16	x16	FH/FL	—	—	—	—	—	—	Supported	
N8116-81	x8	x8	FH/FL	x8	x8	FH/HL	—	—	—	—	
N8116-61 4xPCIe SSD Riser	—	—	—	—	—	—	—	2	—	—	

\*1 The data transfer rate of PCI slot is calculated from a transfer band multiplied by the number of lanes.

<Ex.> x8 lanes = 64Gbps (one way)

\*2 Shows a connector size. Cards having the number of plugs or lower can be connected.

<Ex.> x8 Plug → x1 card, x4 card, or x8 card can be installed. x16 card cannot be installed.

FH: Full height

FL: Full length

\*3 One PCIe SSD connector can support two 2.5 inch PCI SSD.

### 1.13.3 Installing PCI board in the primary/secondary riser

Read the following notes first.

**Important** When installing a PCI card, make sure the connector of the card fits the connector of the riser card.

**Note** Check the card type which respective riser card supports and the type of PCI card to be installed.

**Important** To prevent personal injury, electrical shock or equipment damage, unplug the power cord and ensure no power is supplied to the server. You cannot turn off the system power supply completely by the power button on the front panel. Until the AC power cord is unplugged, the power supply circuit is still active in some parts of the machine.

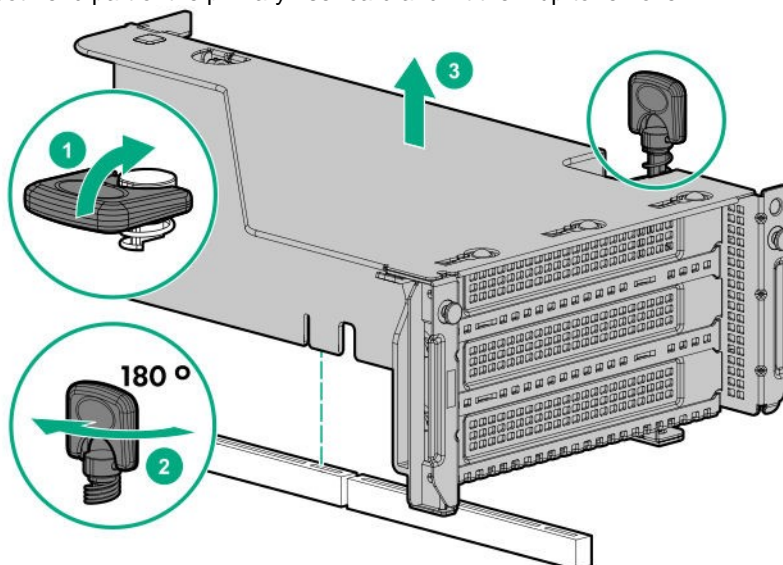
**Note** When running a server, always ensure proper cooling by attaching the top cover, baffle, expansion slot cover, and blank. If the server supports components with hot-plug support, minimize the amount of time the top cover is open.

Please prepare the following before installing the options.

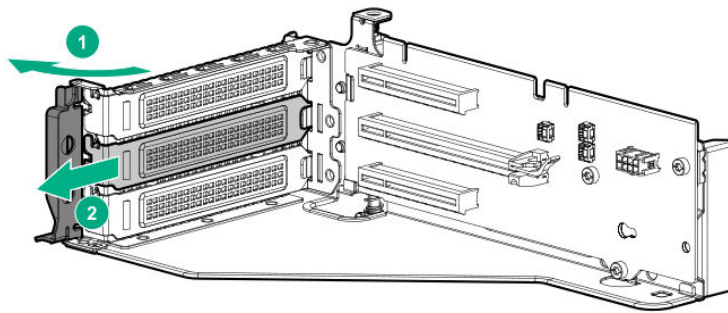
- Parts included in the option kit

To install the components, follow these steps.

1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Raise the screw handles located on the upper part of the riser card and turn it 180°. To the left. Pick up the both end part of the primary riser card and lift them up to remove.

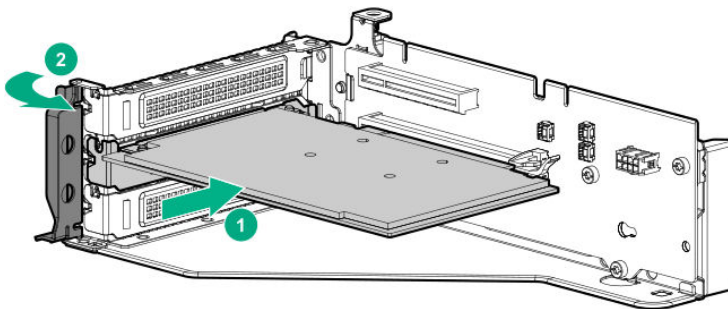


- Open the parts fixing the blank cover of riser card to direction (1) and remove the blank cover by pulling it out to direction (2).

**Note**

Keep each removed blank covers.

- Properly insert the PCI Card port component into the riser card connector, and close it by shutting the PCI card fixing component in the direction of (2).

**Important**

Do not touch the terminal part of riser card or PCI card and the signal pins of electric parts installed on the board. Installing boards with dirt or oil can cause malfunction.

**Note**

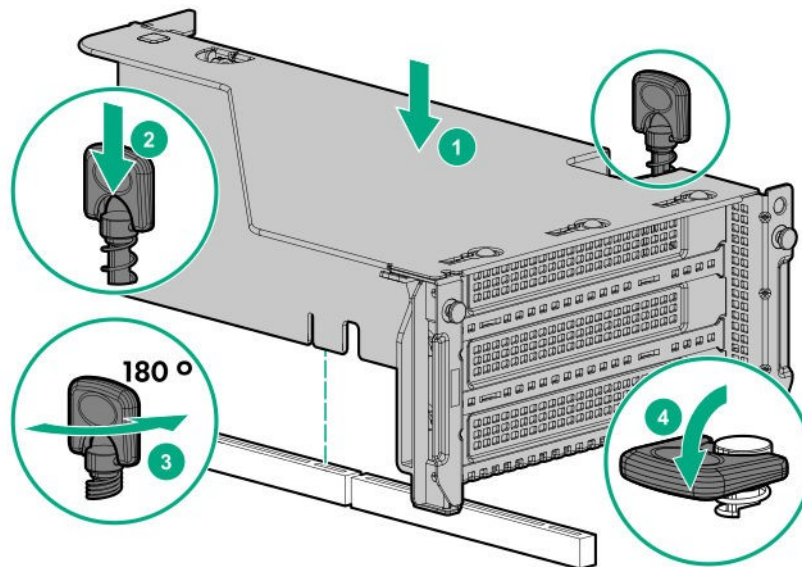
- Make sure that the edge of a PCI card bracket is seated into the fixed slot of the riser card unit.
- Depending on type of PCI cards, the terminal part of the PCI card may be too large to fit in the connector.
- If you have trouble installing the card, remove the card once and try again. If you apply excessive pressure on the card, a PCI card or riser card might break.

- Connect the required internal and external cables to the PCI board. Refer to the documentation that came with the PCI board.

**Tips**

To connect a PCI card to the connector on motherboard with cable, connect a cable to PCI card before installing riser card unit.

- Fit the terminal of riser card to the slot on the mother board and insert the terminal firmly into the slot. Then fix the riser card. Next, raise the screw handle at the top of cage and turn the handle to the right 180 degrees to fix the cage. Then put down the screw handle as before.



7. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

8. Please see *Chapter 2 (2 Installation and Connection)* in this manual to conduct installation and connection, and turn the power supply ON.

### 1.13.4 Installing the Tertiary Riser PCI Card

Read the following notes first.

**Important** When installing a PCI card, make sure the connector of the card fits the connector of the riser card.

**Note** Check the card type which respective riser card supports and the type of PCI card to be installed.

**Important** To prevent personal injury, electrical shock or equipment damage, unplug the power cord and ensure no power is supplied to the server. You cannot turn off the system power supply completely by the power button on the front panel. Until the AC power cord is unplugged, the power supply circuit is still active in some parts of the machine.

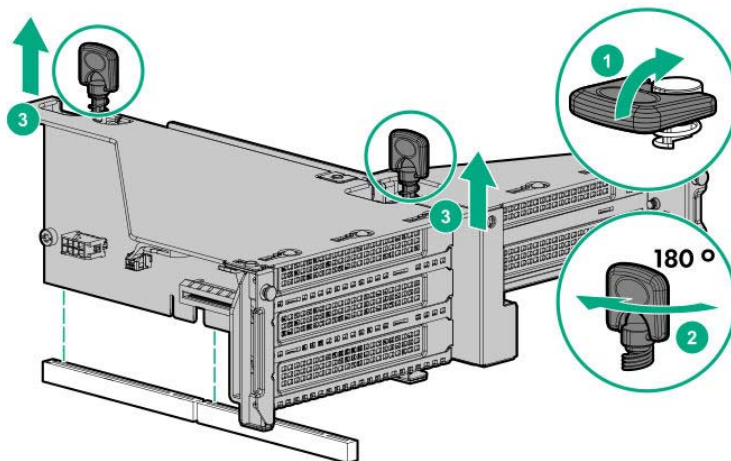
**Note** When running a server, always ensure proper cooling by attaching the top cover, baffle, expansion slot cover, and blank. If the server supports components with hot-plug support, minimize the amount of time the top cover is open.

Please prepare the following before installing the options.

- Parts included in the option kit

To install the components, follow these steps.

1. Back up all data in the server.
2. See steps 1 to 6 in Chapter 2 (1.2 Overview of Installation and Removal) for preparations.
3. Raise the screw handles at the top of riser card (Butterfly Riser) and turn them to the left 180 degrees. Then hold both sides of cage and lift them upright to remove the cage.



4. Remove the blank cover of riser card following the procedures shown for primary/ secondary riser.

**Note** Keep each removed blank covers.

5. Install the PCI card and fix it in place by following the same procedure in the primary and secondary risers.



**Important** Do not touch the terminal part of riser card or PCI card and the signal pins of electric parts installed on the board. Installing boards with dirt or oil can cause malfunction.

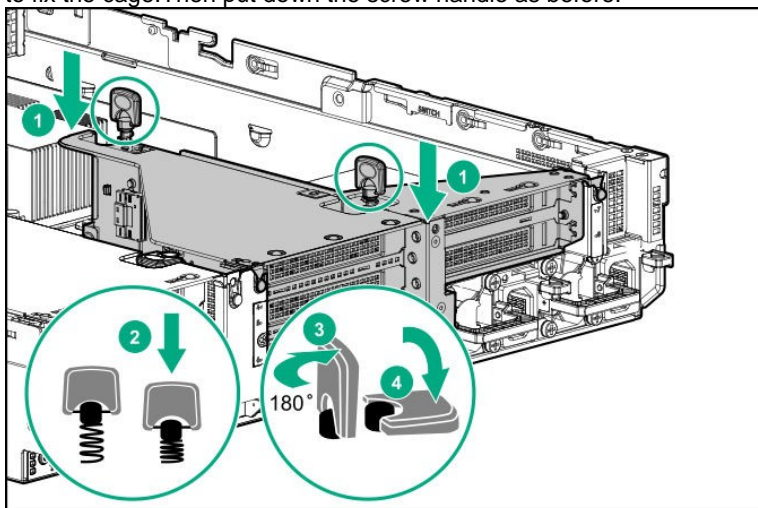
**Note**

- Make sure that the edge of a PCI card bracket is seated into the fixed slot of the riser card unit.
- Depending on type of PCI cards, the terminal part of the PCI card may be too large to fit in the connector.
- If you have trouble installing the card, remove the card once and try again. If you apply excessive pressure on the card, a PCI card or riser card might break.

6. Connect the required internal and external cables to the PCI board. Refer to the documentation that came with the PCI board.

**Tips** To connect a PCI card to the connector on motherboard with cable, connect a cable to PCI card before installing riser card unit.

7. Fit the terminal of riser card to the slot on the mother board and insert the terminal firmly into the slot. Then fix the riser card. Next, raise the screw handle at the top of cage and turn the handle to the right 180 degrees to fix the cage. Then put down the screw handle as before.



8. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

**Note** In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

9. Please see *Chapter 2 (2 Installation and Connection)* in this manual to conduct installation and connection, and turn the power supply ON.

### 1.13.5 Removal

The procedure for removal is the reverse of installation.

Re-attach the blank cover if you operate without it attached.

**Important** Re-attach the blank cover removed to maintain the internal cooling.



## 1.14 RAID controller (PCI Board Type-p)

RAID controller (PCI Board) is supported.

RAID controller N8103-195/196/201 are provided.

**Important** The surface becomes hot after use so to avoid burns please allow the drive and internal parts of the system to cool before touching.

**Note** In order to prevent the damage to electronic components, please start to install the system after conducting the appropriate anti-static treatment. There is a possibility of causing electrostatic discharge if appropriate grounding wire treatment is not conducted.

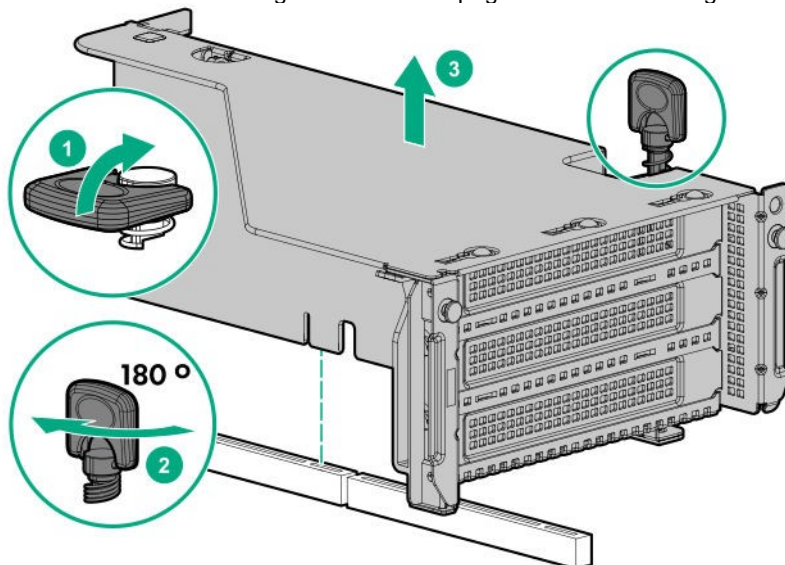
### 1.14.1 Installing RAID Controller

Please prepare the following before installing the option.

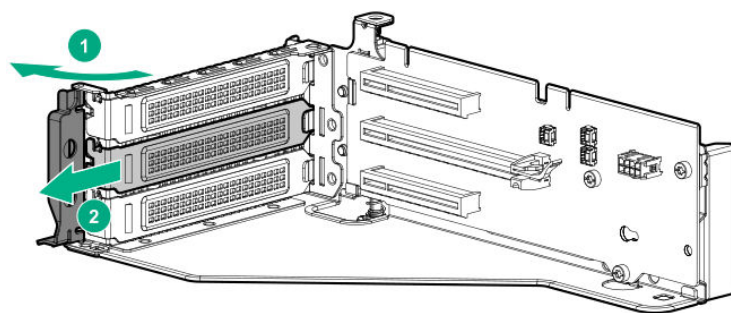
- Parts included in the option kit

To install the components, follow these steps.

1. Make sure that the following requirements are met.
  - The RAID controller battery must be installed in a controller with the FBWC function (N8103-196/201).
  - If connecting a cable, make sure to connect to a component connector according to the label attached on the cable.
  - Confirm that the RAID controller and SAS Expander firmware are updated to the latest versions.
2. See steps 1 to 7 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
3. Raise two screw handles at the top of riser card (Butterfly Riser) and turn them to the left 180 degrees. Then hold both sides of cage and lift them upright to remove the cage.

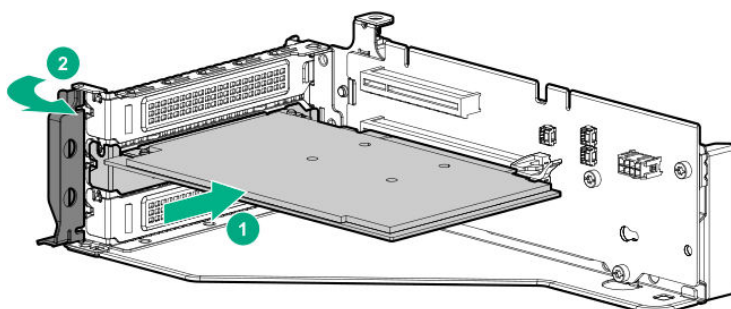


4. Open the parts fixing the blank cover of riser card to direction (1) and remove the blank cover by pulling it out to direction (2).

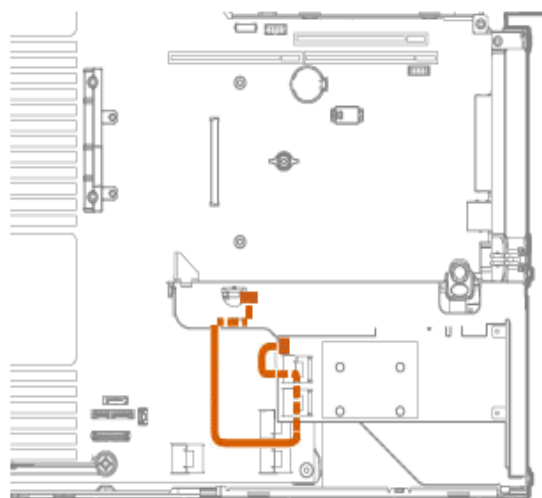
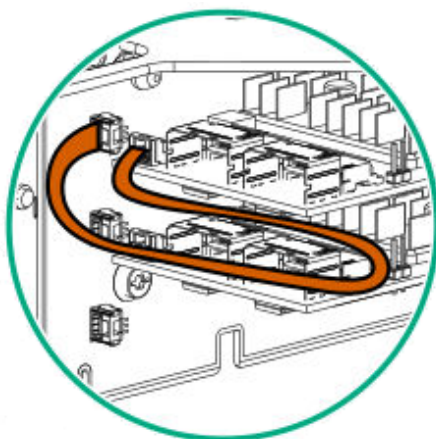
**Note**

Keep each removed blank covers.

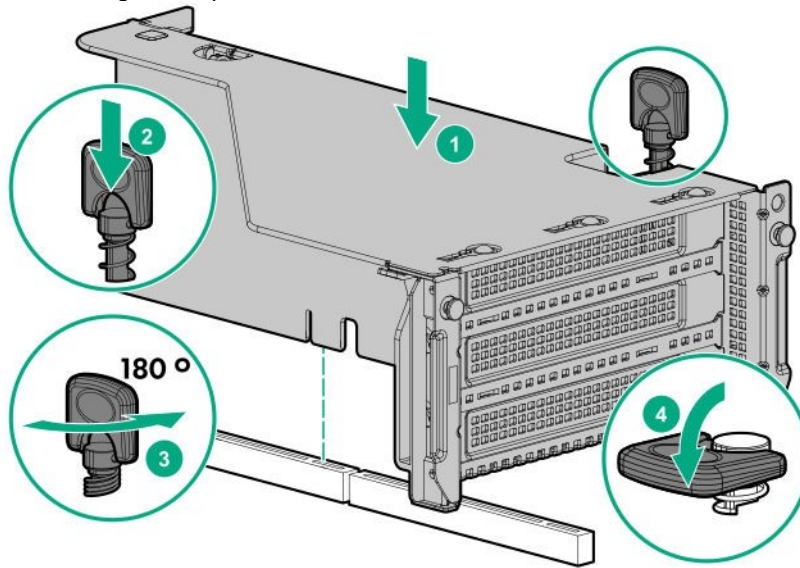
5. Fit properly the terminal parts of PCI board to the connector of riser card and insert the terminal parts into the connector. Then shut the parts to fix PCI board to direction (2) and fix firmly.



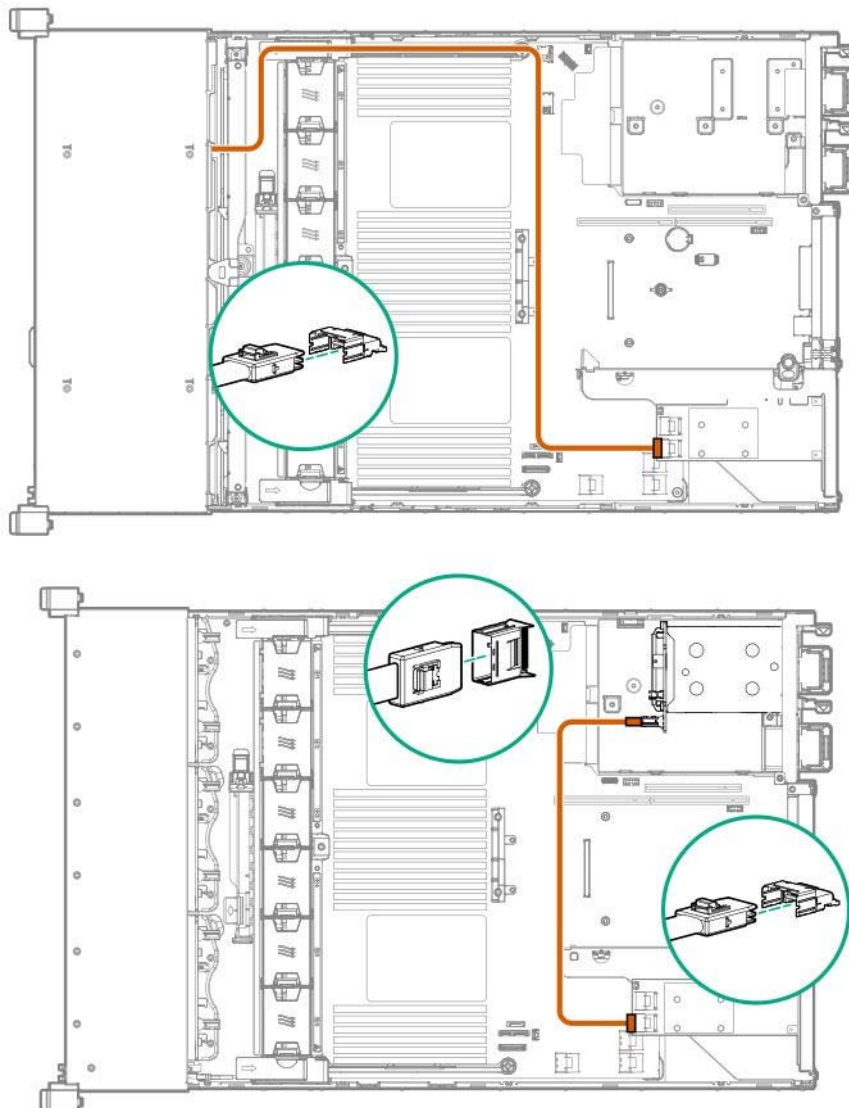
6. Connect power cable for cache backup.



7. Fit the terminal of riser card to the slot on the mother board and insert the terminal firmly into the slot. Then fix the riser card. Next, raise the screw handle at the top of cage and turn the handle to the right 180 degrees to fix the cage. Then put down the screw handle as before.



8. As shown in the diagram below, connect Front Disc BP and RAID Controller with SAS Cable.



9. See *Chapter 2 (1.33 Attaching the air baffle)* to attach the air baffle.
10. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

11. Please see *Chapter 2 (2 Installation and Connection)* in this manual to conduct installation and connection, and turn the power supply ON.

### ***1.14.2 Removal***

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The procedure for removal is the reverse of installation.

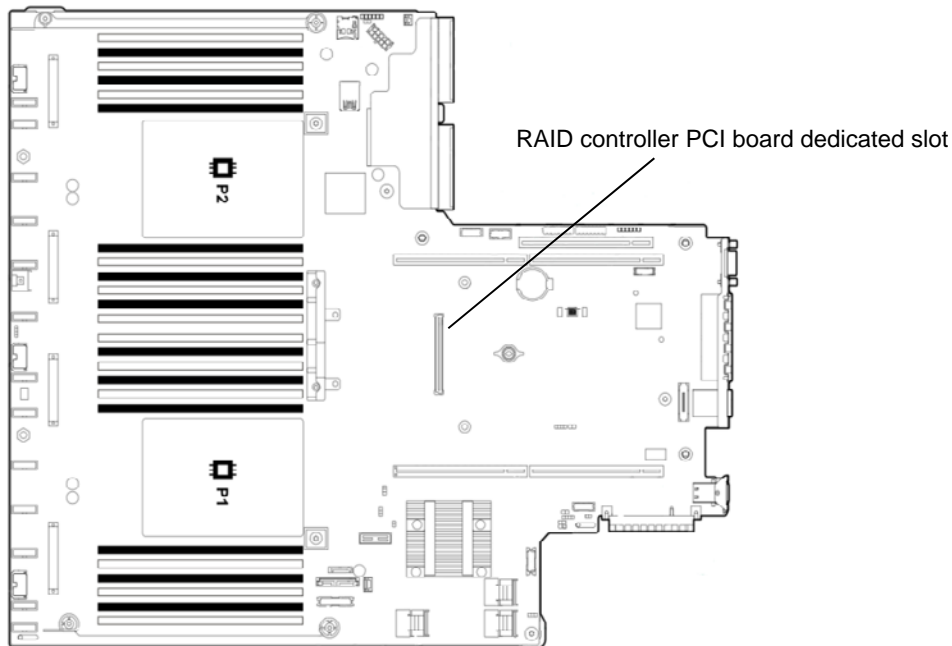
Re-attach the blank cover if you operate without it attached.

**Important**

To maintain the cooling effect in the server, install the blank cover.

## 1.15 RAID controller N8103-189/190/191 (AROC Type-a)

This server supports RAID controller PCI board dedicated slot.



**Important** The surface becomes hot after use so to avoid burns please allow the drive and internal parts of the system to cool before touching.

**Note** In order to prevent the damage to electronic components, please start to install the system after conducting the appropriate anti-static treatment. There is a possibility of causing electrostatic discharge if appropriate grounding wire treatment is not conducted.

### 1.15.1 Installation

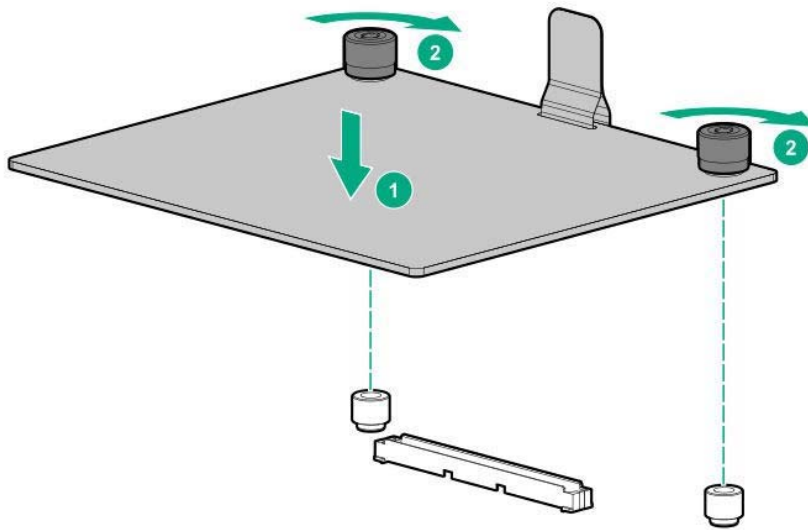
Please prepare the following before installing the option.

- Parts included in the option kit

To install the components, follow these steps.

1. Make sure that the following requirements are met.
  - RAID Controller Battery has to be fixed to a controller equipped with FBWC feature (N8103-190/191).
  - When you connect a cable, connect it to a connector of parts following the direction of label attached to the cable.
  - Check that the versions of firmware of RAID Controller and SAS Expander are the latest.
2. See steps 1 to 7 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.

3. Position the guide pin of the RAID controller to the connector of the motherboard, firmly insert it from above, tighten the screws securing it in place.



4. Connect Front Disc BP and RAID Controller with SAS Cable.
5. See *Chapter 2 (1.33 Attaching the air baffle)* to attach the air baffle.
6. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

7. Please see *Chapter 2 (2 Installation and Connection)* in this manual to conduct installation and connection, and turn the power supply ON.

### 1.15.2 Removal

The procedure for removal is the reverse of installation.

Re-attach the blank cover if you operate without it attached.

**Important**

Re-attach the blank cover removed to maintain the internal cooling.

## 1.16 12G SAS Expander N8116-51

Make sure that the following requirements are met before installing the 12G SAS Expander.

- You should install the following components.
  - ✧ RAID controller
  - ✧ Drive cage:
    - For 24 x 2.5-inch HDD configuration: BOX1 and BOX2 2.5-inch x8 front drive cage
    - If using rear drive cage configuration: 2 x 2.5-inch or 3 x 3.5-inch rear drive cage
- To confirm if the cable is properly connected, check the labels on the cable and the component connector.
- Confirm that the RAID controller and SAS Expander firmware are updated to the latest versions.
- See each of the tables below and confirm the required cable connection.

• Group A: From RAID controller to SAS Expander Card

Cable	Description	Connection to SAS Expander	Connection to Controller
869802-001	X4 Mini-SAS cable	Port 2	Port 2
869803-001	X4 Mini-SAS cable	Port 1	Port 1

• Group B: From SAS Expander to front 2.5-inch drive cage

Cable	Description	Connection to SAS Expander	Connection to Drive BOX
776402-001	X4 Mini-SAS cable	Port 3	2.5-inch drive BOX1
776402-001	X4 Mini-SAS cable	Port 4	2.5-inch drive BOX1
776402-001	X4 Mini-SAS cable	Port 5	2.5-inch drive BOX2
776402-001	X4 Mini-SAS cable	Port 6	2.5-inch drive BOX2
776402-001	X4 Mini-SAS cable	Port 7	2.5-inch drive BOX3
776402-001	X4 Mini-SAS cable	Port 8	2.5-inch drive BOX3
869823-001	X4 Mini-SAS cable	Port 9	2.5-inch drive BOX4 or 5 or 6

• Group C: From SAS Expander to rear drive cage

Cable	Description	Connection to SAS Expander	Connection to Drive BOX
869827-001	X4 Mini-SAS cable	Port 3	3.5-inch drive BOX1
869827-001	X4 Mini-SAS cable	Port 4	3.5-inch drive BOX2
869827-001	X4 Mini-SAS cable	Port 5	3.5-inch drive BOX3
869824-001	X4 Mini-SAS cable	Port 6	3.5-inch drive BOX7
869823-001	X4 Mini-SAS cable	Port 7	2.5-inch drive BOX4
869823-001	X4 Mini-SAS cable	Port 8	2.5-inch drive BOX5
869823-001	X4 Mini-SAS cable	Port 9	2.5-inch drive BOX6 or 3.5-inch drive BOX6





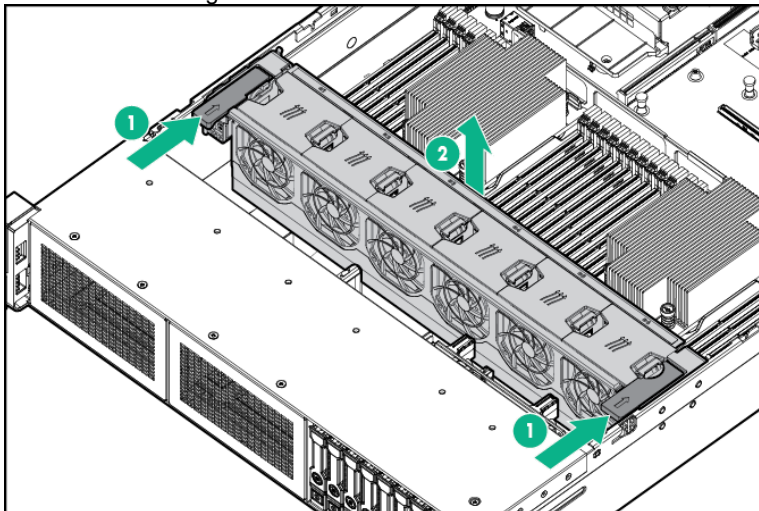
### 1.16.1 Installation

Please prepare the following before installing the options.

- Parts included in the option kit

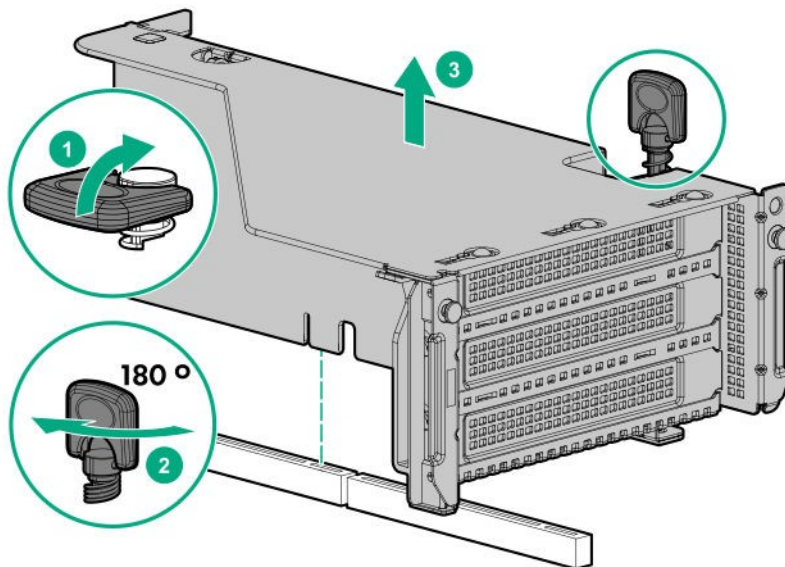
To install the components, follow these steps.

1. See steps 1 to 7 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Remove the fan cage.

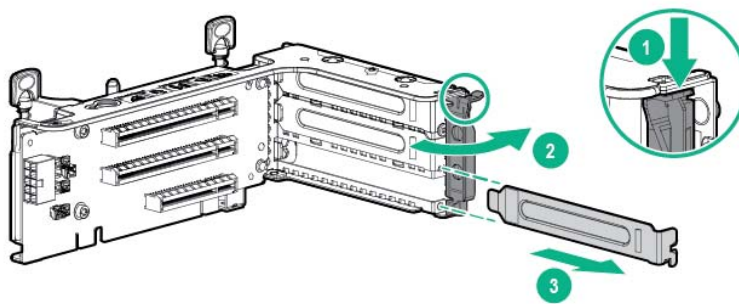


3. Raise the screw handles at the top of primary riser card and turn them to the left 180 degrees. Then hold both sides of cage and lift them upright to remove the cage.



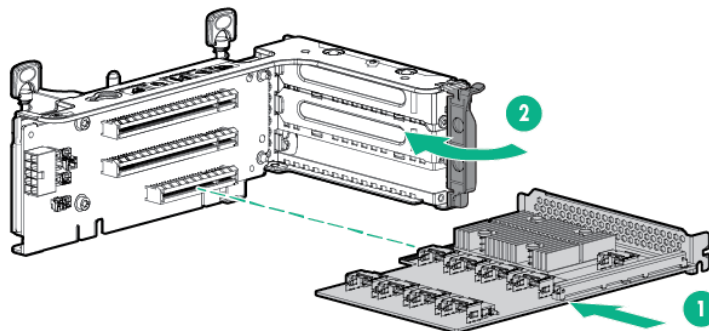


4. Press down the parts fixing the blank cover of riser card and open the cover to direction (2). Then remove the blank cover of Slot 3.

**Note**

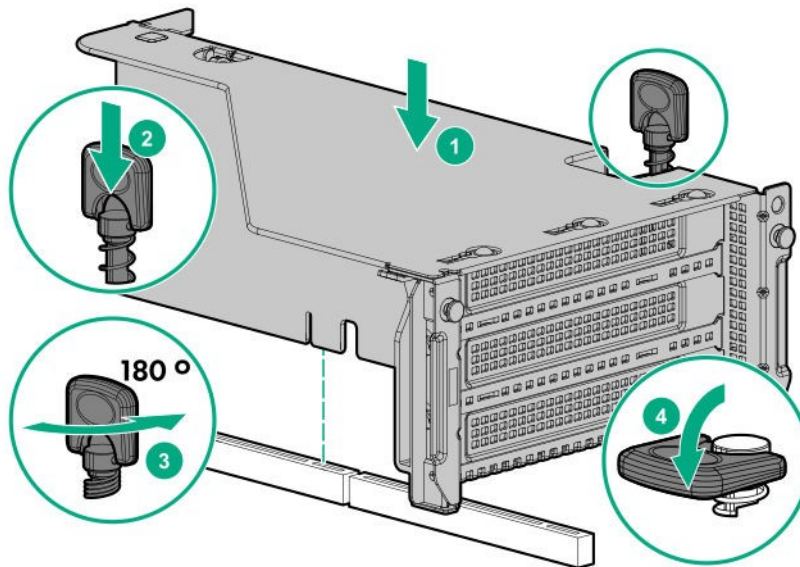
Keep each removed blank covers.

5. Properly insert the SAS Expander Card port component into the riser card connector, and close it by shutting the PCI card fixing component in the direction of (2).

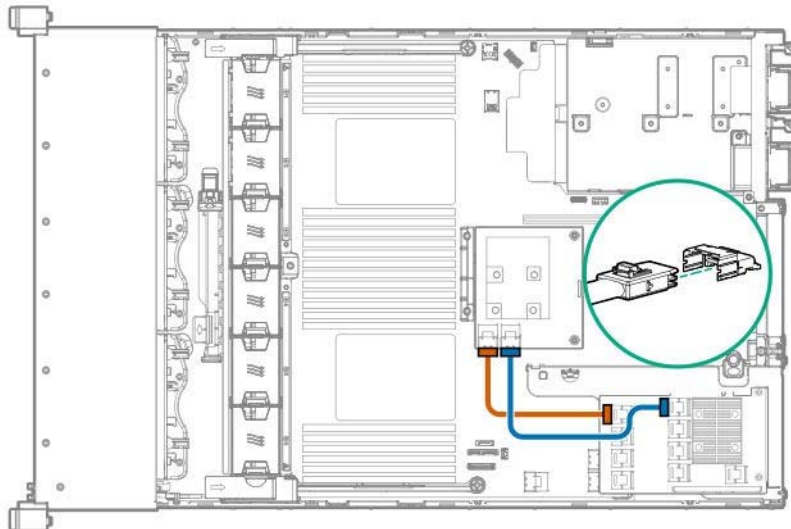
**Important**

The 12G SAS Expander Card requires a RAID controller. There are 2 types of RAID controllers: Type-a and Type-p.

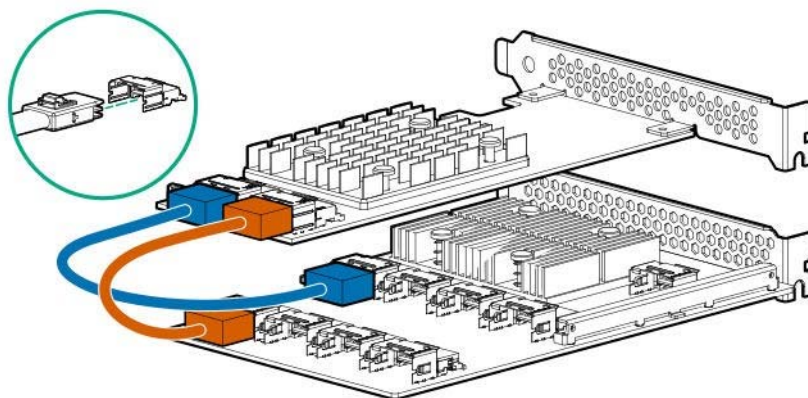
6. Fit the terminal of riser card to the slot on the mother board and insert the terminal firmly into the slot. Then fix the riser card. Next, raise the screw handle at the top of cage and turn the handle to the right 180 degrees to fix the cage. Then put down the screw handle as before.



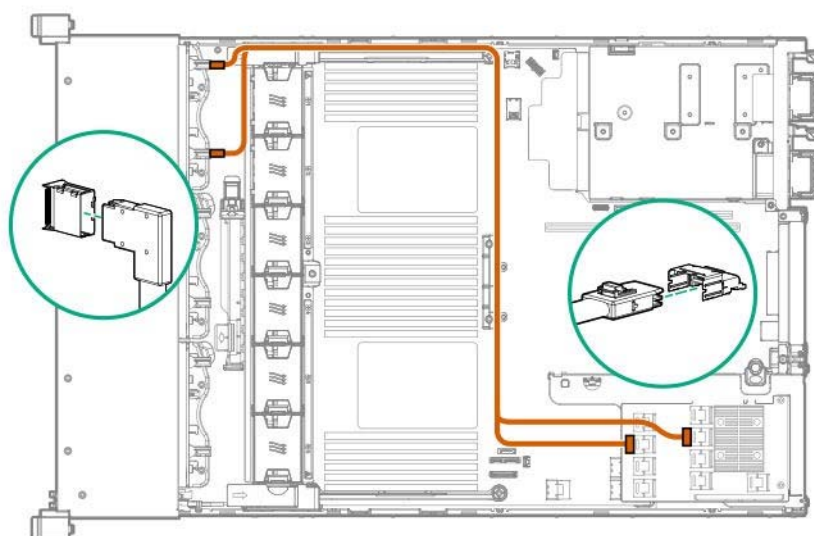
7. Confirm if the cable is properly connected by checking the label, and connect the SAS Expander Card cable to the controller.
  - Connecting the PCI board (Type-a) exclusively for the RAID controller and the SAS expander



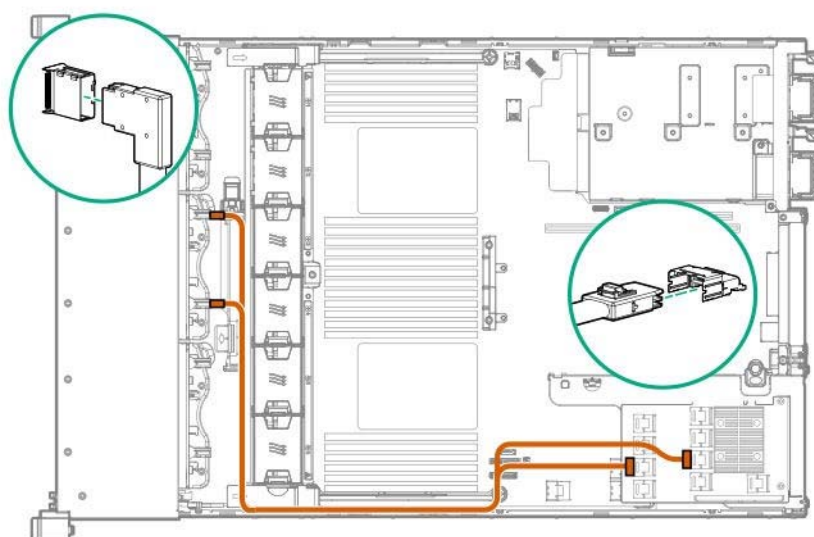
- Connecting the PCI board (Type-p) exclusively for the RAID controller and the SAS expander



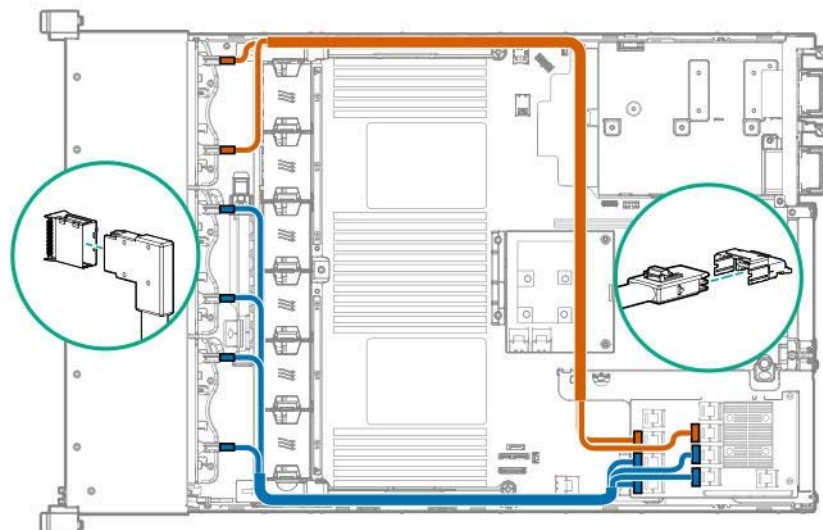
8. Connect the SAS expander and the backplanes of the various drive cages.
- Connecting the backplane of the 2.5-inch drive BOX 1 and the SAS expander



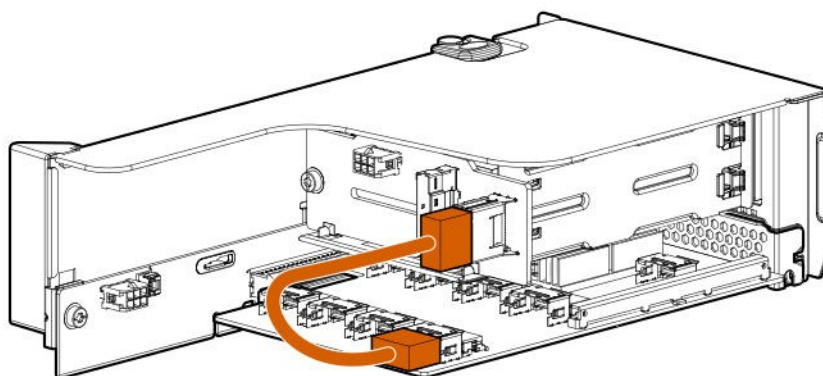
- Connecting the backplane of the 2.5-inch drive BOX 2 and the SAS expander



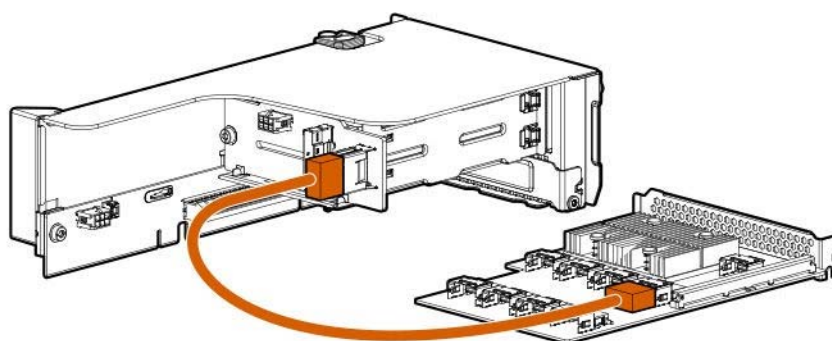
- Connecting the backplane of the 2.5-inch drive BOX 1, BOX 2, BOX 3 and the SAS expander



- Connecting the backplane of the rear primary 2.5-inch drive cage and the SAS expander

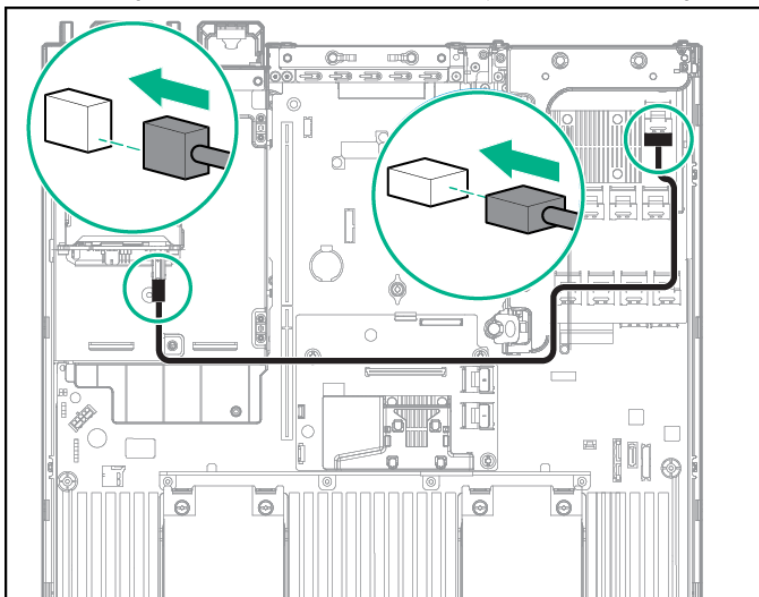


- Connecting the backplane of the rear secondary 2.5-inch drive cage and the SAS expander

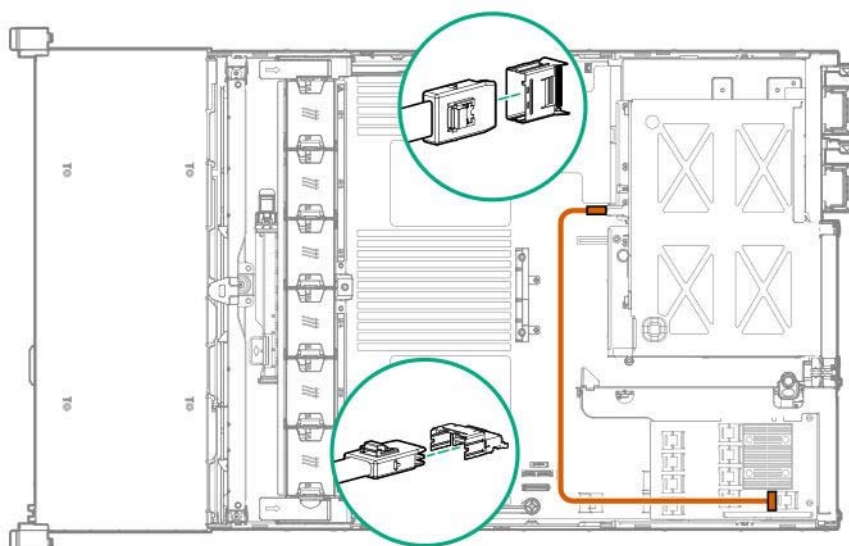




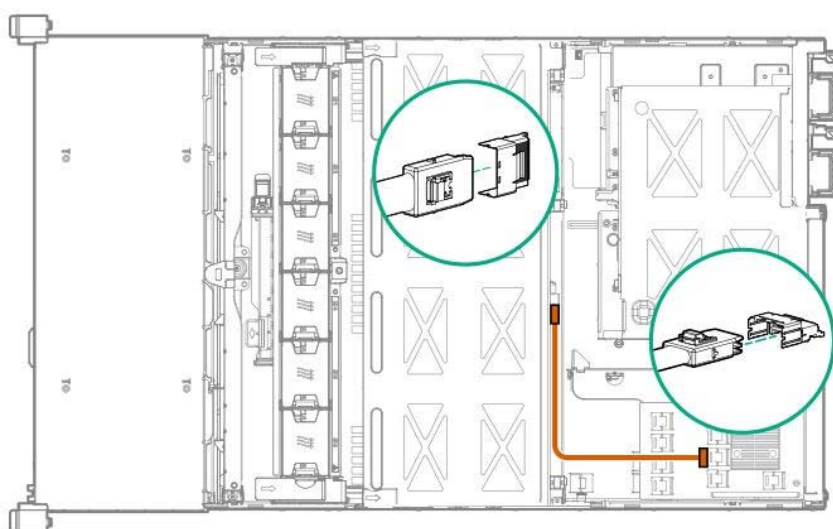
- Connecting the backplane of the rear tertiary 2.5-inch drive cage and the SAS expander



- Connecting the backplane of the rear 3x3.5-inch drive cage and the SAS expander

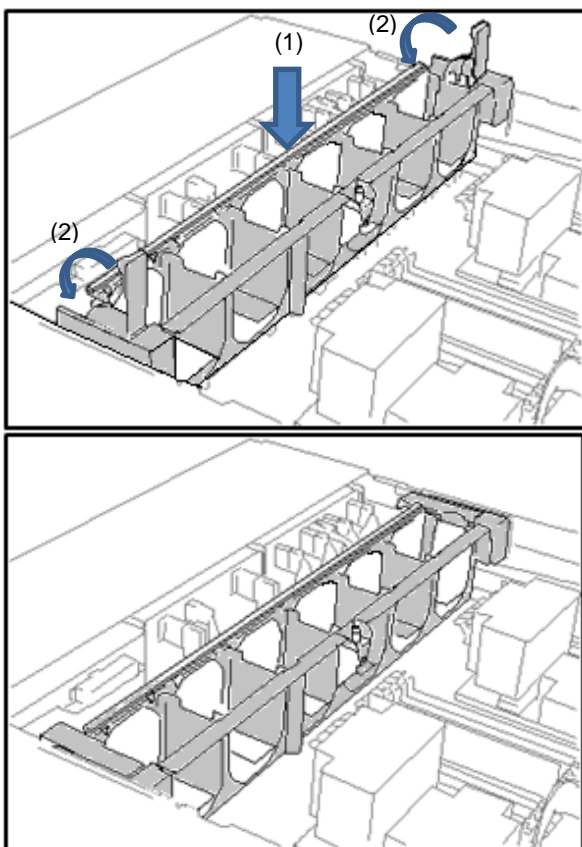


- Connecting the backplane of the midplane 4x3.5-inch drive cage and the SAS expander

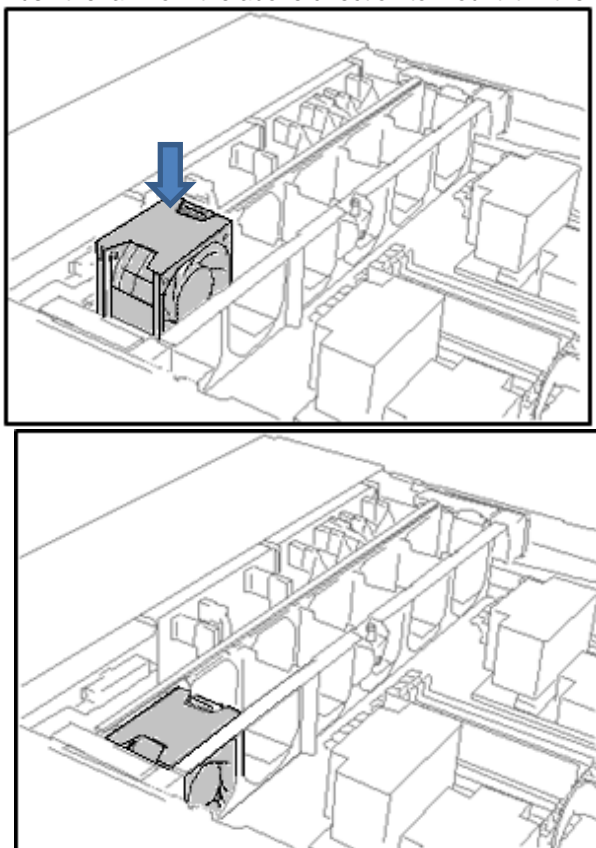


9. Remove all the fans from the fan cage to the state where only the fan cage is left.

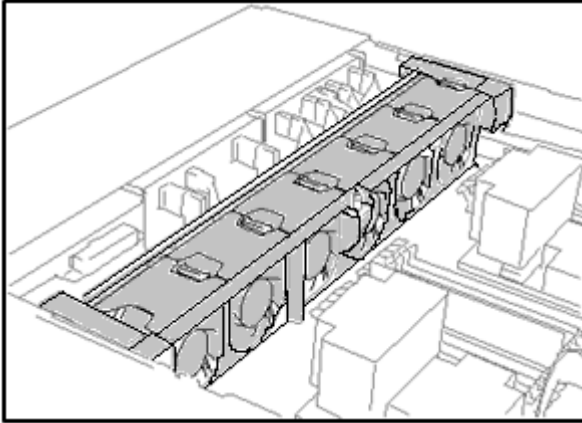
Next, align the fan cage with the device, push the cage slowly from the above direction, and tilt both sides of the levers to secure it.



10. Push the fan from the above direction to mount it in the fan cage.



11. Reinstall all the fans that have been removed earlier.



12. See *Chapter 2 (1.33 Attaching the air baffle)* to attach the air baffle.
13. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

14. Please see *Chapter 2 (2 Installation and Connection)* in this manual to conduct installation and connection, and turn the power supply ON.

## 1.16.2 Removal

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The procedure for removal is the reverse of installation.

Re-attach the blank cover if you operate without it attached.

**Important**

To maintain the cooling effect in the server, install the blank cover.

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## 1.17 GPU Card

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The GPU card can be installed in each position of the primary, secondary or tertiary slot.

The procedure for installing in the secondary slot position is described here.

**Important** You must avoid static electricity to work with the procedure below. For details, see Chapter 1 (1.8 Anti-static Measures) in Safety Precautions and Regulatory Notices.

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### 1.17.1 Installation

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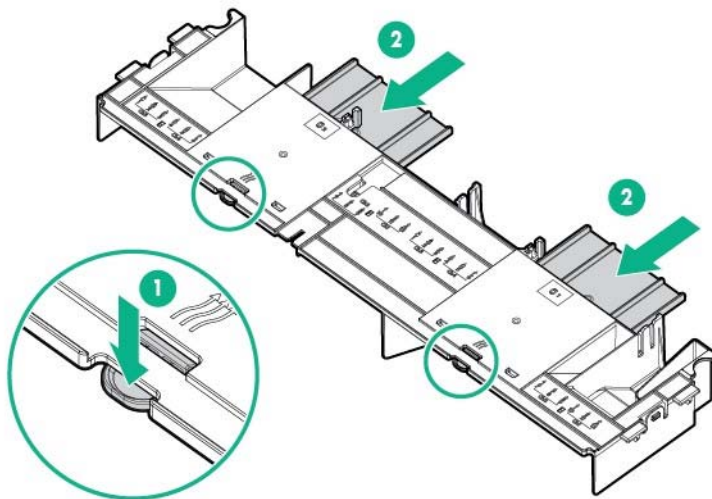
Please prepare the following before installing the option.

- Parts included in the option kit
- T-30 hexalobular driver
- T-10 hexalobular driver
- Along this option, a high performance heat sink also needs to be installed.
- Along this option, a high performance fan also needs to be installed.

To install the components, follow these steps.

**Note** In order to prevent damage to the device due to improper cooling or high temperature, do not operate the device unless all the PCIe slots are installed with either a slot cover or a PCI board.

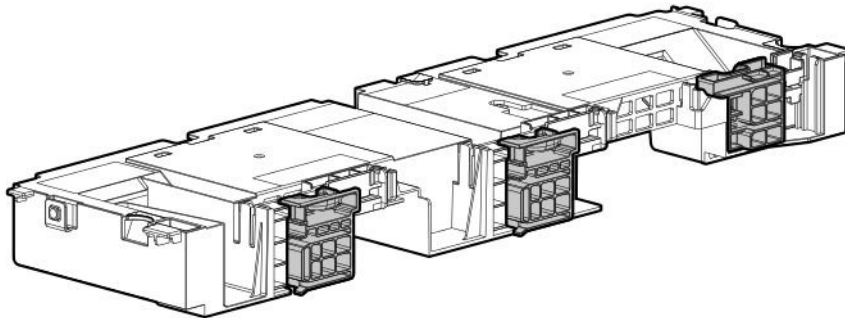
1. See steps 1 to 7 in Chapter 2 (1.2 Overview of Installation and Removal) for preparations.
2. Remove the air diversion component from the air baffle.



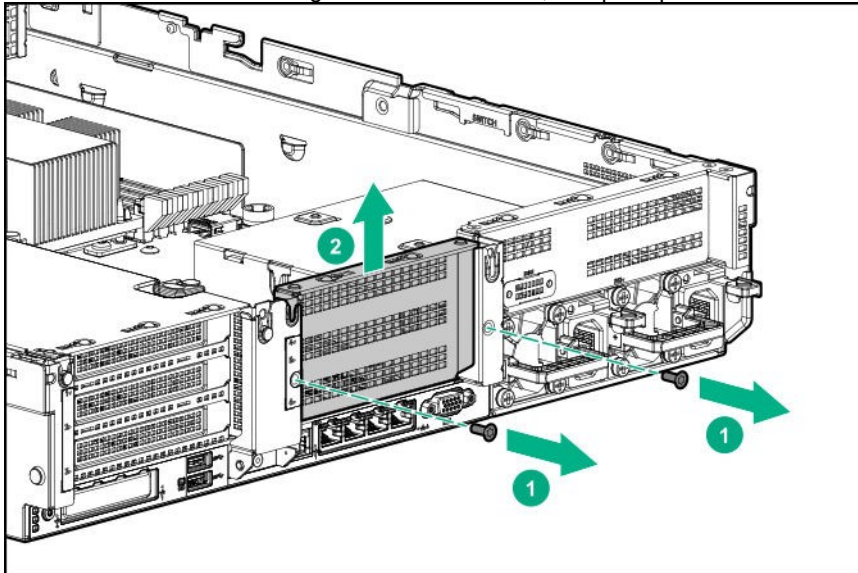


3. Attach the appropriate retaining clip parts to the air baffle.

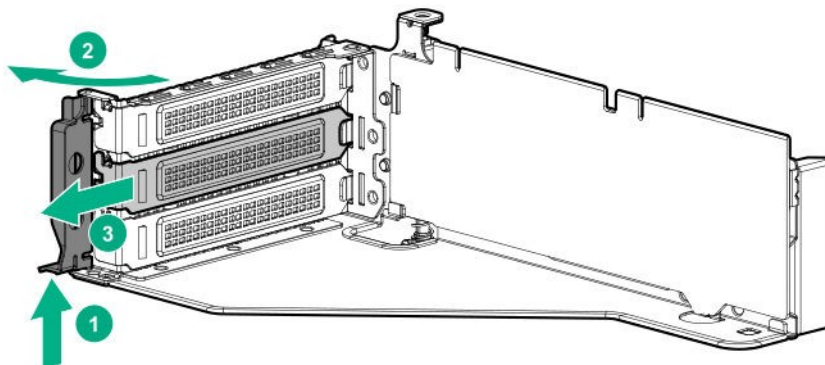
The locations of primary, secondary and tertiary are shown in the figure. Attach the clip parts according to each configuration.



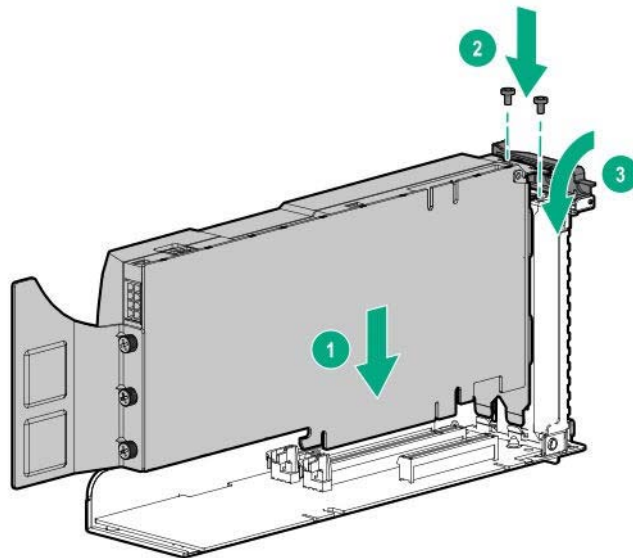
4. Install the high performance heat sink. See *Chapter 2 (1.10 High-performance CPU heat sink module N8101-1286, 1U heat sink)*.
5. Attach the air baffle. See *Chapter 2 (1.33 Attaching the air baffle)*.
6. Unfasten two screws securing the rear blank cover, and pull up the blank cover to remove it.



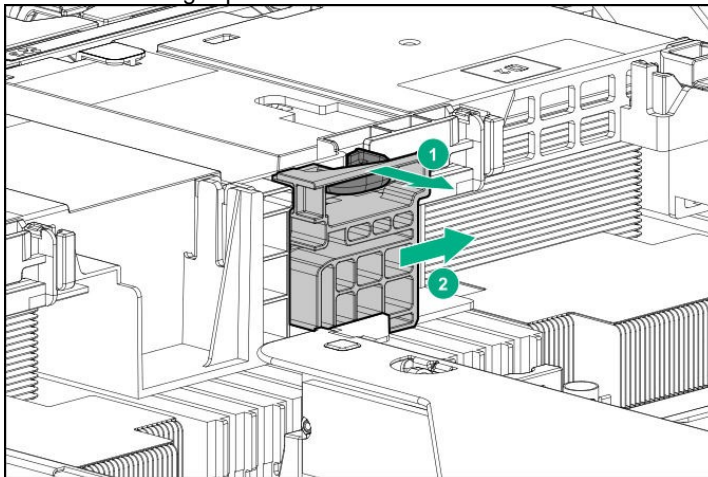
7. Remove the blank cover of the riser card which you intend to install GPU.  
Open the parts fixing the blank cover to direction (1) and remove the blank cover by pulling it out to direction (2).



8. Align and insert the terminal part of the GPU board correctly into the connector of the riser card, and secure the GPU with screws. Then, close the part in the direction of (3).

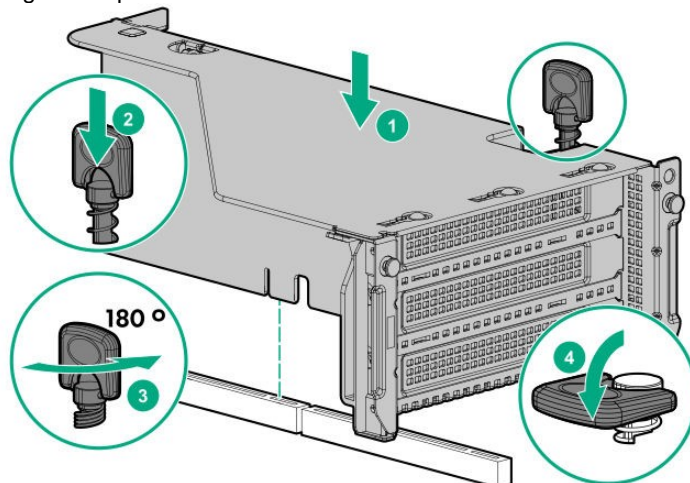


9. Connect a power cable from the GPU to a power connector on the riser.
10. Slide the retaining clip to the unlock side.

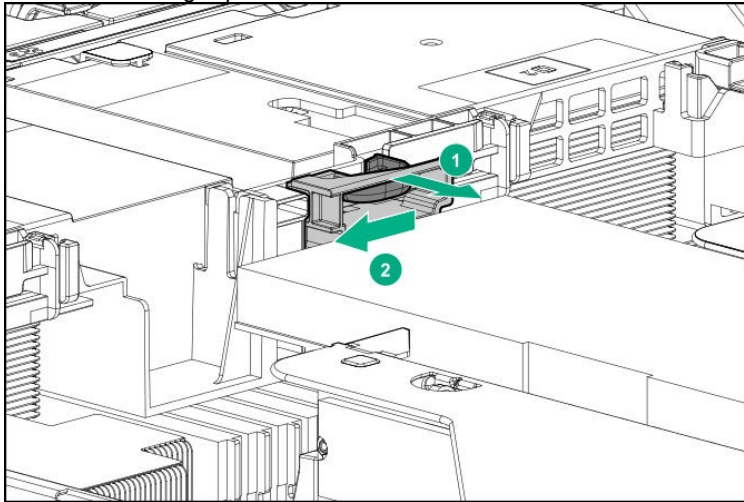


11. Align the terminal part of the riser card with the slot part on the motherboard and insert them securely. Then, install the GPU mounted riser card.

Next, raise the screw handle at the top of cage and turn the handle to the right 180 degrees to fix the cage. Then put down the screw handle as before.



12. Slide the retaining clip to the lock side.



13. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

14. Please see *Chapter 2 (2 Installation and connection)* in this manual to conduct installation and connection, and turn the power supply ON.

### **1.17.2 Removal**

The procedure for removal is the reverse of installation.

Re-attach the blank cover if you operate without it attached.

**Important**

Re-attach the blank cover removed to maintain the internal cooling.

## 1.18 LOM Card

The server supports LOM Card which is the replaceable onboard network adapter.

Install LOM Card to the LOM Card slot on motherboard. The motherboard has one slot to install LOM Card.

**Important** You must avoid static electricity to work with the procedure below. For details, see *Chapter 1 (1.8 Anti-static Measures)* in *Safety Precautions and Regulatory Notices*.

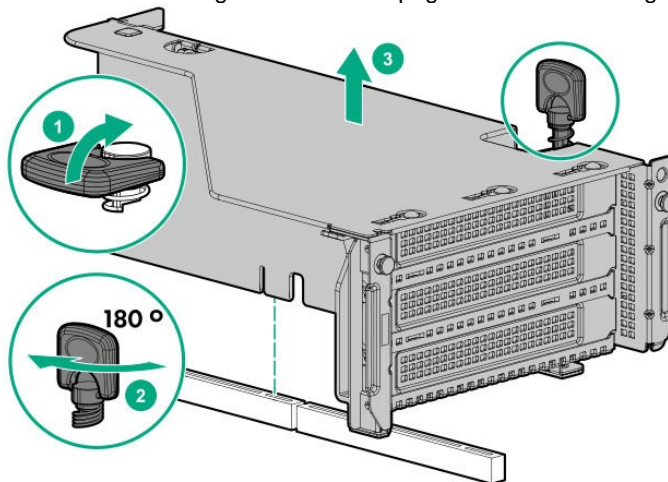
### 1.18.1 Installation

Please prepare the following before installing the option.

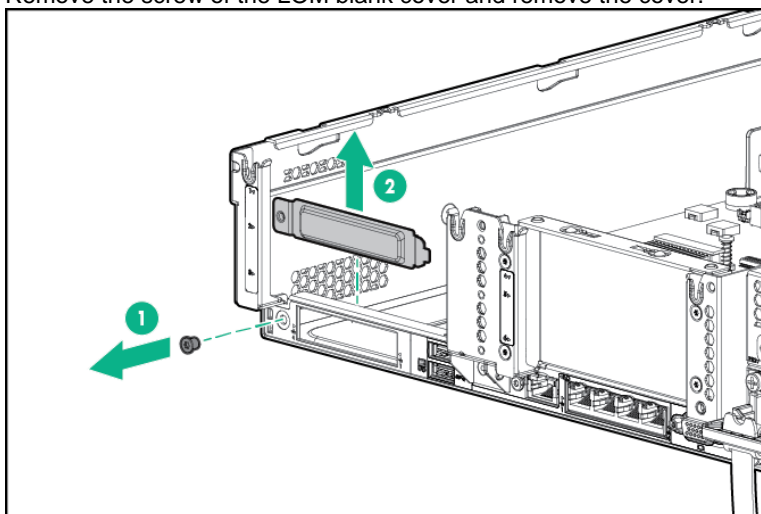
- Parts included in the option kit
- T-10 hexalobular driver

To install the components, follow these steps.

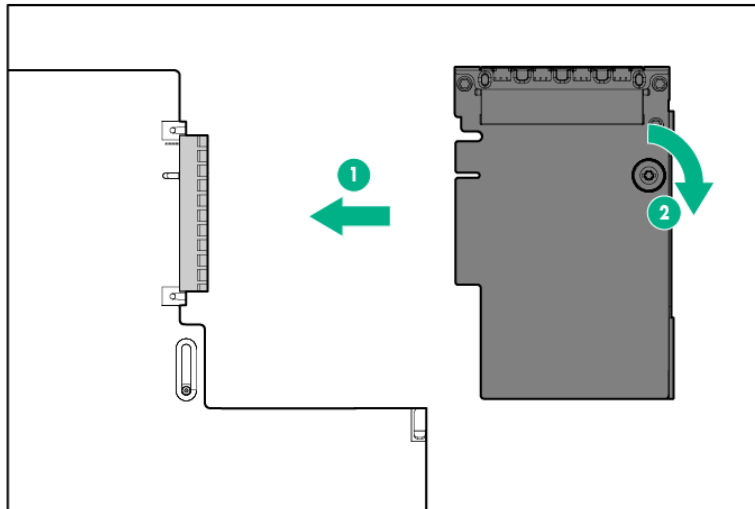
1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Raise two screw handles at the top of the primary riser card and turn them to the left 180 degrees. Then hold both sides of cage and lift them upright to remove the cage.



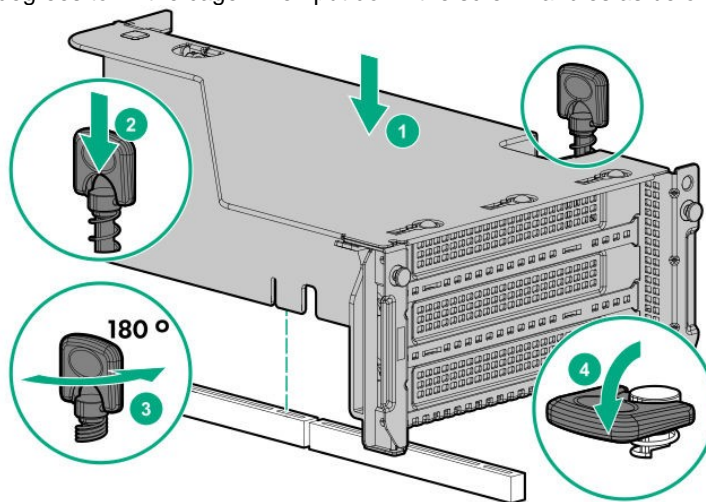
3. Remove the screw of the LOM blank cover and remove the cover.



4. Align the LOM card pins to the LOM connector of the motherboard and insert it.  
Tighten the screws firmly.



5. Fit the terminal of riser card to the slot on the motherboard and insert the terminal firmly into the slot. Then fix the primary riser card. Second, raise the screw handles at the top of the cage and turn them to the right 180 degrees to fix the cage. Then put down the screw handles as before.



6. See Chapter 2 (1.34 Installing Top Cover) to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

7. Please see Chapter 2 (2 Installation and Connection) in this manual to conduct installation and connection, and turn the power supply ON.

### 1.18.2 Removal

The procedure for removal is the reverse of installation.

Re-attach the blank cover if you operate without it attached.

**Important**

To maintain the cooling effect in the server, install the blank cover in the vacant LOM Card slot.



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## 1.19 RAID controller extension battery N8103-198

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When mounting a RAID controller (N8103-190/191/196/201), by installing an extension battery, data loss due to accident such as power shortage can be avoided. if Write Back being enabled,

### 1.19.1 Handling precautions

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When using an extension battery, please pay attention to the following. If you ignore the following warnings, there may be loss of data and hardware.

- The extension battery is an extremely sensitive device. Prior to installation, avoid static electricity by touching the metal frame of the unit or similar.
- Do not drop or otherwise damage the extension battery.
- For recycling and disposal of extension batteries, refer to the user's guide attached to the RAID controller or extension battery.

### 1.19.2 Installing the N8103-198 extension Battery

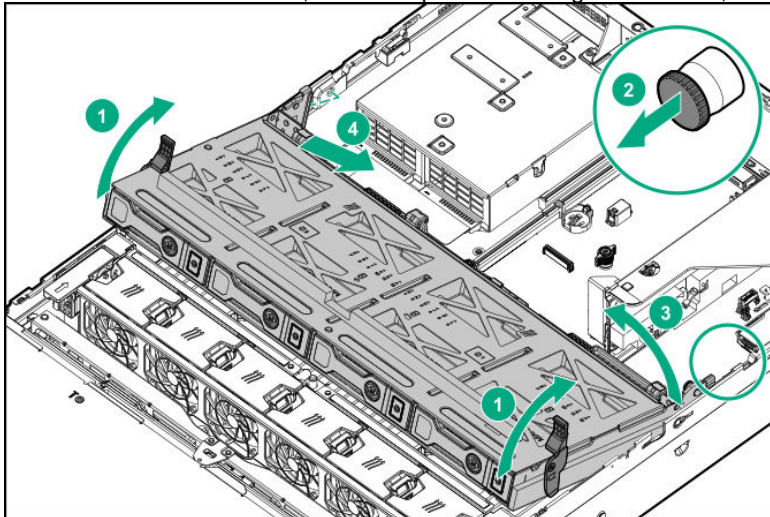
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Please prepare the following before installing the options.

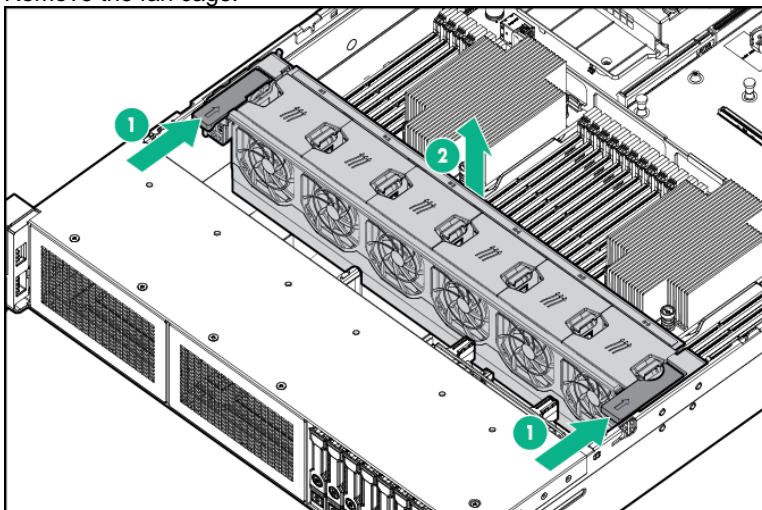
- Parts included in the option kit

To install the components, follow these steps.

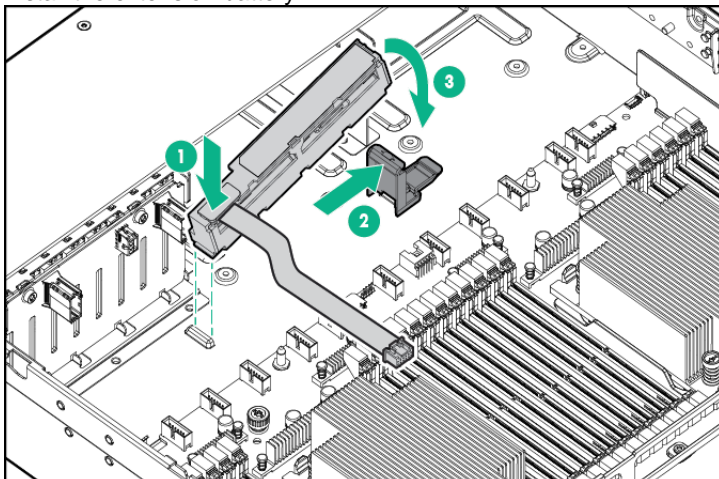
1. See steps 1 to 7 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. For the 3.5-inch drive model, if the mid-plane drive cage is attached, it must be removed.



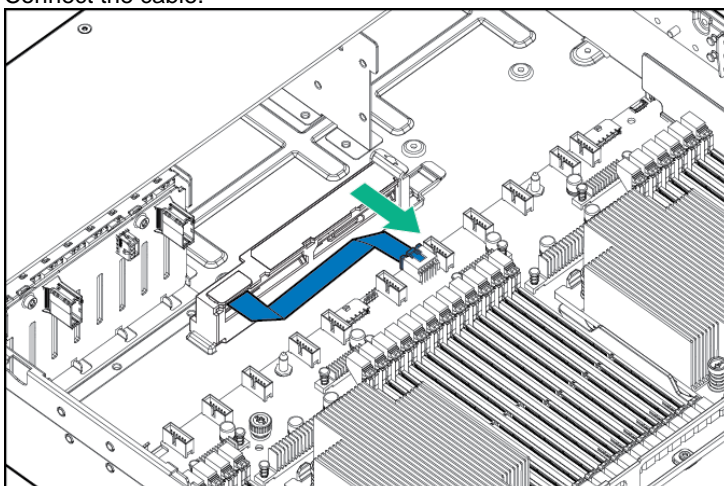
3. Remove the fan cage.



4. Install the extension battery.

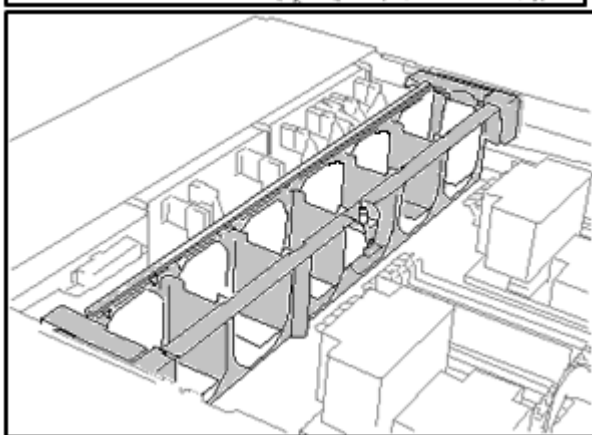
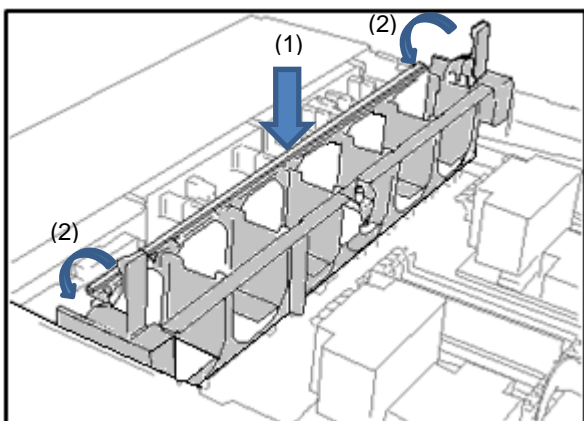


5. Connect the cable.

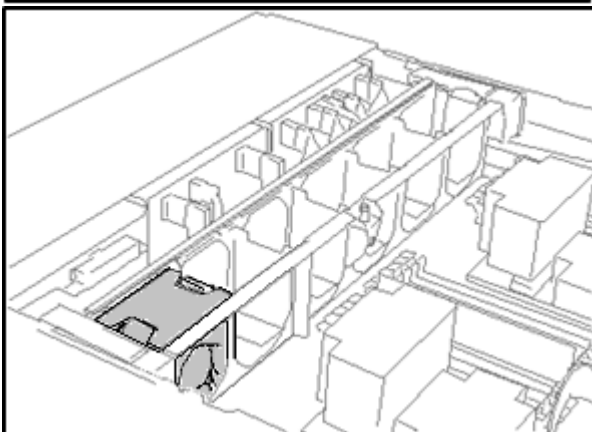
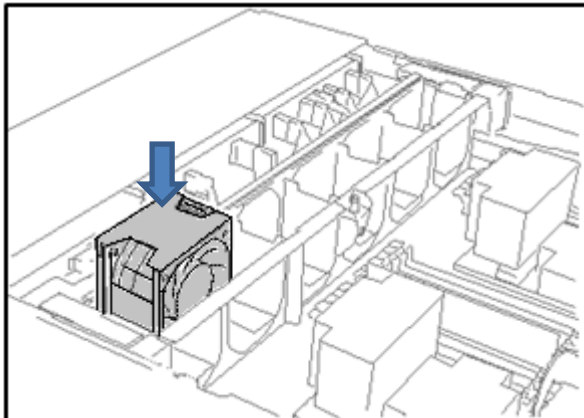


6. Remove all the fans from the fan cage to the state where only the fan cage is left.

Next, align the fan cage with the device, push the cage slowly from the above direction, and tilt both sides of the levers to secure it.

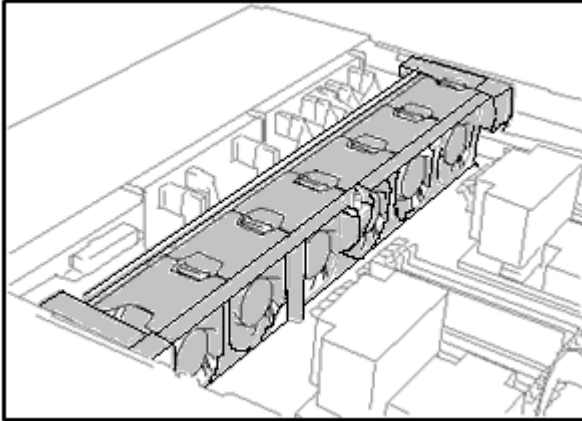


7. Push the fan from the above direction to mount it in the fan cage.





8. Reinstall all the fans that have been removed earlier.



9. See *Chapter 2 (1.33 Attaching the air baffle)* to attach the air baffle.
10. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

11. Please see *Chapter 2 (2 Installing Internal Optional Devices)* in this manual to conduct installation and connection, and turn the power supply ON.

### ***1.19.3 Removal***

---

The procedure for removal is the reverse of installation.

Re-attach the blank cover if you operate without it attached.

**Important**

To maintain the cooling effect in the server, install the blank cover in the vacant LOM Card slot.

## 1.20 VMware ESXi USB flash memory for installation (N8106-016/017)

VMware ESXi USB flash memory for installation (N8106-016/017) can be connected to USB 3.0 connector inside the device.

Two types of USB flash memory are prepared.

- ① N8106-016 2x8GB microSD card installing kit (USB)  
Two microSDs able to install and boot VMware ESXi and USB conversion kit
- ② N8106-017 8GB USB memory  
USB flash memory able to install and boot VMware ESXi

### ■ Notes

- N8106-016 2x8GB microSD card installing kit (USB) is equipped with RAID1 function.
- The function cannot be installed with M.2 SATA SSD.
- This product does not include an install media of ESXi and the license.

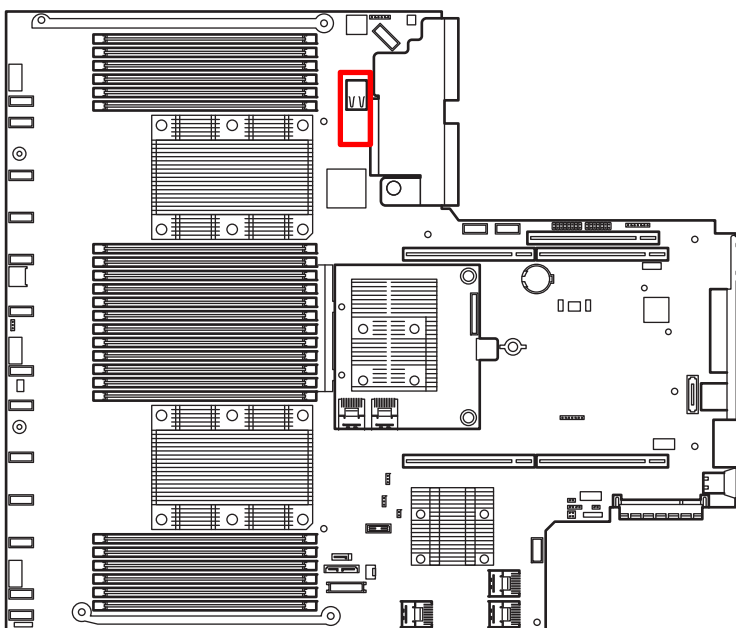
### 1.20.1 Installation of USB flash memory N8106-016/017

#### Note

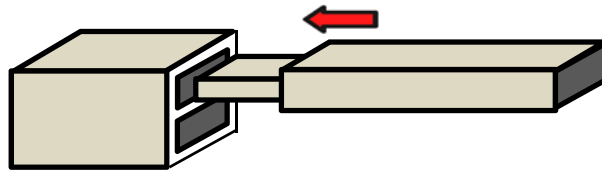
In order to prevent the damage for the electronic parts, start the installation of system after providing proper anti-static treatment. If a proper earth is not provided, electrostatic discharge may occur.

When installing the components, follow the steps below.

1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Confirm the position of USB 3.0 connector inside.



3. Insert USB flash memory into the connector.



### ***1.20.2* Removal**

---

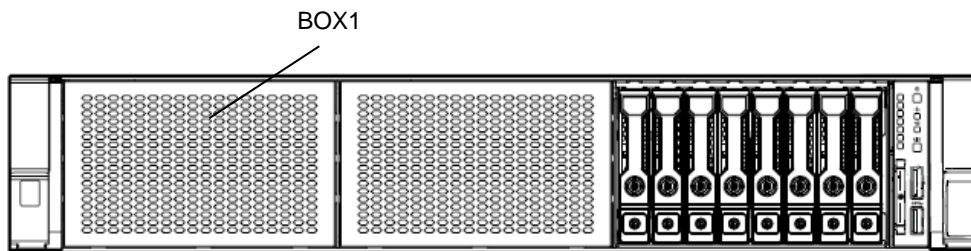
When removing, practice the steps of installing reversely.

When you operate the device without components, install the blank cover that was installed on the device.

**Important** In order to maintain the cooling effect inside, install the blank cover which you removed.

## 1.21 8x 2.5-inch drive model Universal Media Bay / Optical Disc Drive

For the 8 x 2.5-inch drive model, install the universal media bay in Box 1. Inside, you can install the optional 2x SAS/SATA drive or the optical disk drive.



### 1.21.1 Installing Internal DVD Expansion Kit

**Note**

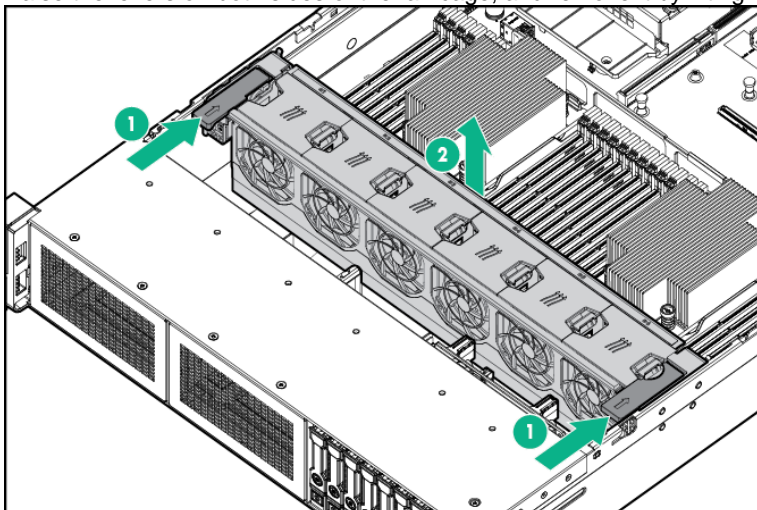
In order to prevent the damage to electronic components, please start to install the system after conducting the appropriate anti-static treatment. There is a possibility of causing electrostatic discharge if appropriate grounding wire treatment is not conducted.

Please prepare the following before installing the option.

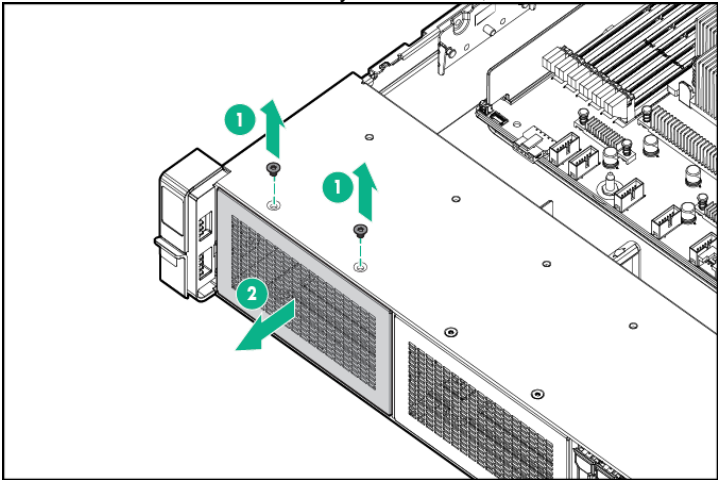
- Parts included in the option kit
- T-10 hexalobular driver

To install the components, follow these steps.

1. Back up all data in the server.
2. See steps 1 to 7 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
3. Raise the levers on both sides of the fan cage, and remove it by lifting it upwards.

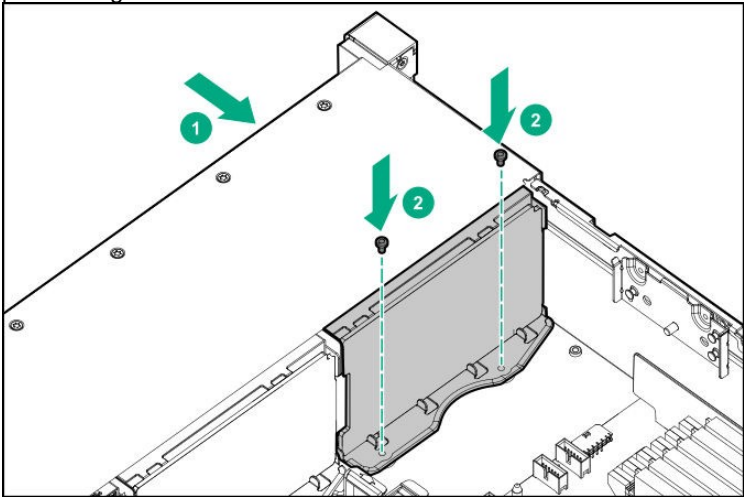


4. Remove the 2 screws on the bay blank cover, and remove the cover pulling it out forward.

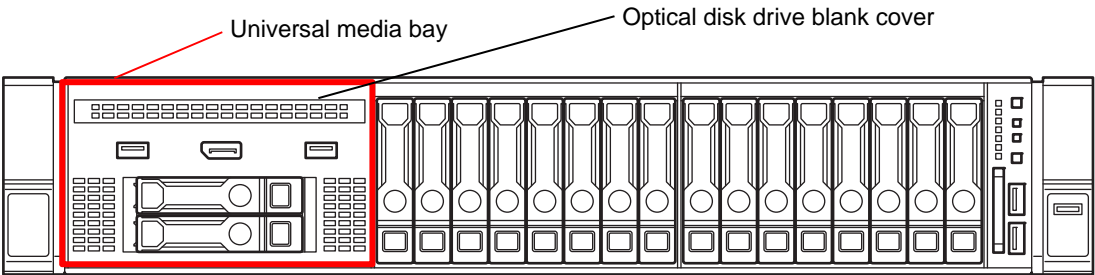


**Note** Keep each removed blank covers.

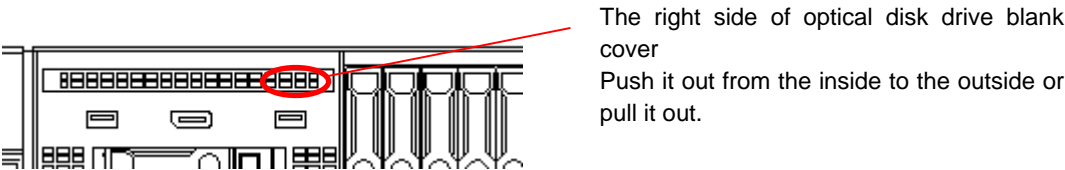
5. Insert the universal media bay cables from the front, and insert the universal media bay unit and fix it in place using the 2 screws.



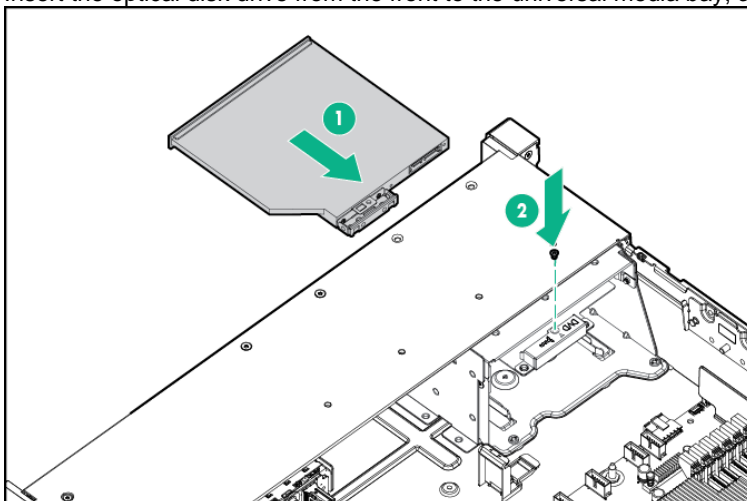
6. If installing the optional optical disk drive, remove the optical disk drive blank cover.



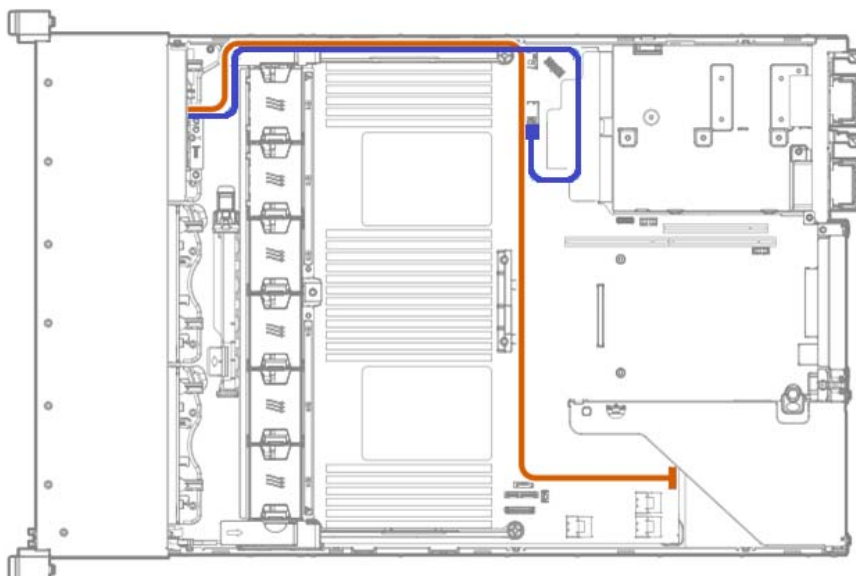
The blank cover can be dismantled by pushing out the right end from the inside to the outside of module or by pulling it out.



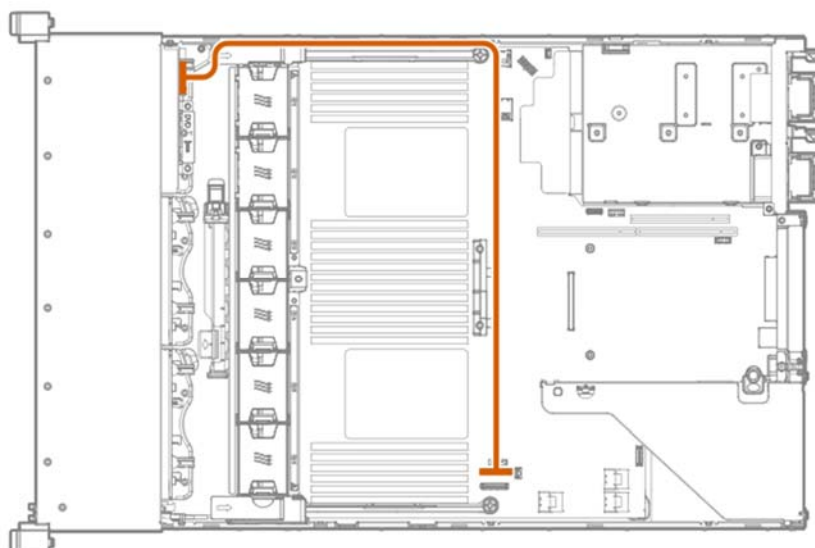
7. Insert the optical disk drive from the front to the universal media bay, and fix it in place with a screw.



8. Connect cables.
- Connect the Displayport cable to the Displayport connector.
  - Connect the USB cable to the front dual internal USB 3.0 connector.

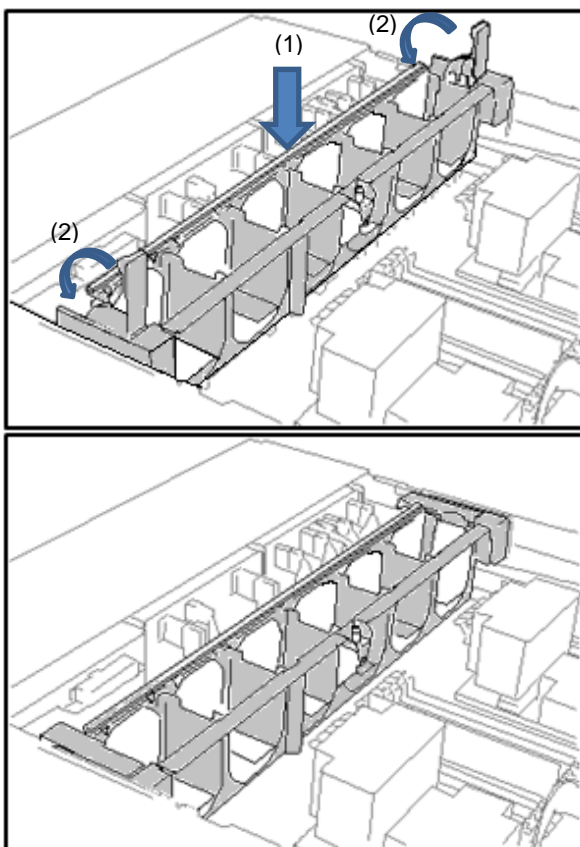


- Connect an optional optical disk drive cable to Connector SATA5.
- Connect the optional optical disk drive cable to the connector SATA5.

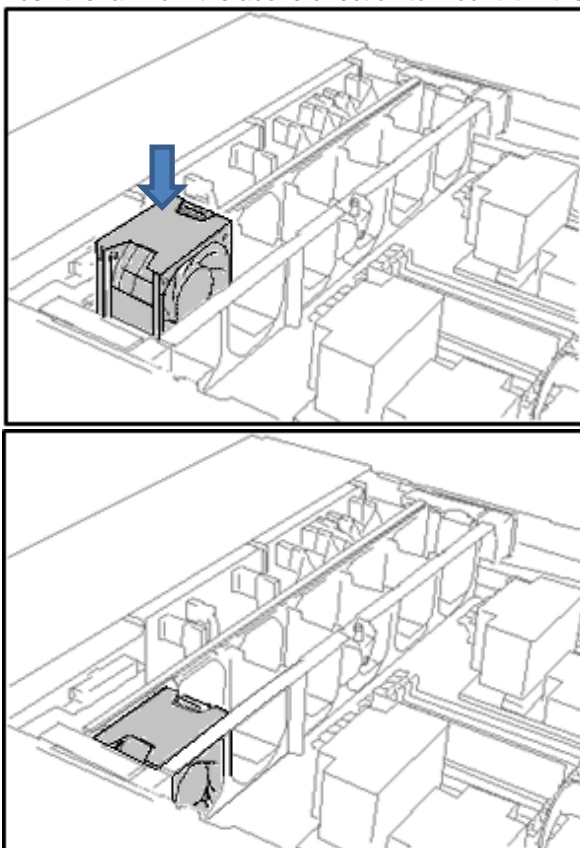


9. Remove all the fans from the fan cage to the state where only the fan cage is left.

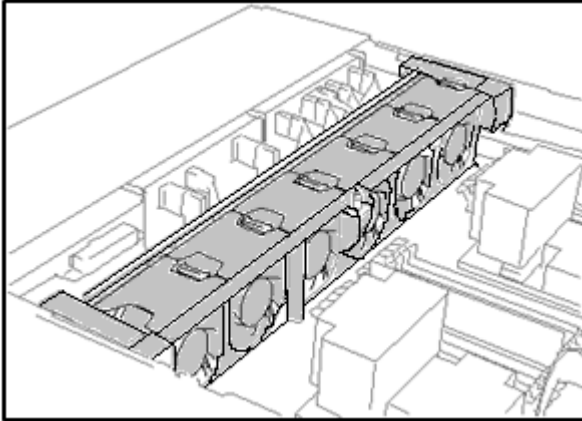
Next, align the fan cage with the device, push the cage slowly from the above direction, and tilt both sides of the levers to secure it.



10. Push the fan from the above direction to mount it in the fan cage.



11. Reinstall all the fans that have been removed earlier.



12. See *Chapter 2 (1.33 Attaching the air baffle)* to attach the air baffle.
13. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

14. Please see *Chapter 2 (2 Installation and Connection)* in this manual to conduct installation and connection, and turn the power supply ON.

### ***1.21.2 Removal***

---

The procedure for removal is the reverse of installation.

Re-attach the blank cover if you operate without it attached.

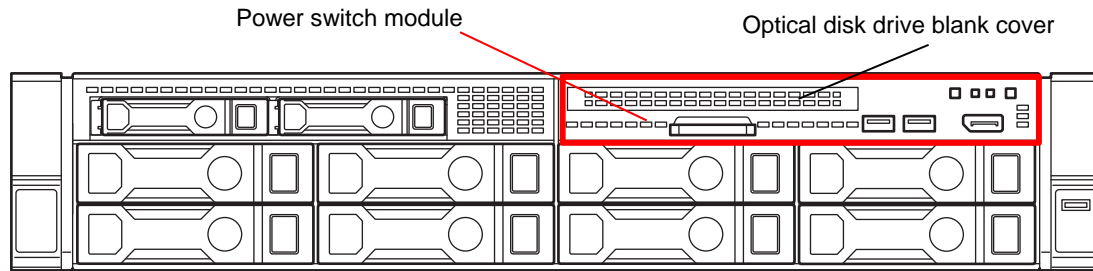
**Important**

Re-attach the blank cover removed to maintain the internal cooling.



## 1.22 8x 3.5 inch drive model Optical disk drive

With an 8x 3.5 drive model, an optional optical disk drive can be installed inside the power switch module.



### 1.22.1 Installing a optical disk drive

#### Note

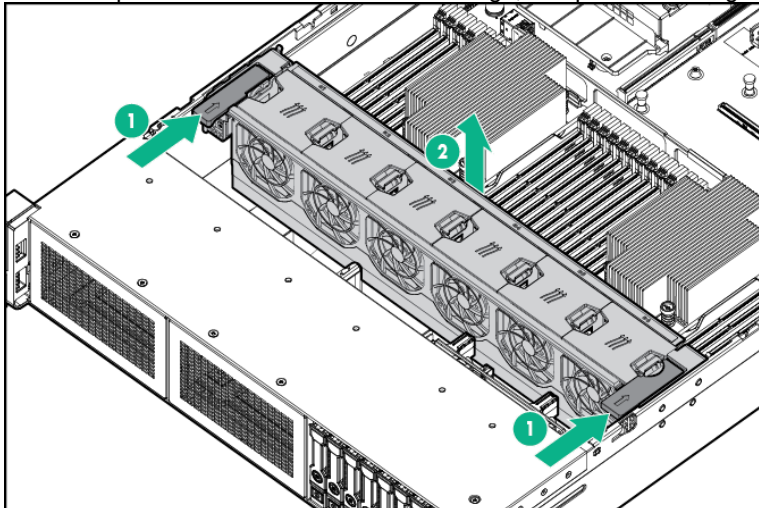
In order to prevent the damage for the electronic parts, start the installation of system after providing proper anti-static treatment. If a proper earth is not provided, electrostatic discharge may occur.

Before installing the option, prepare the followings.

- T-10 hexalobular driver

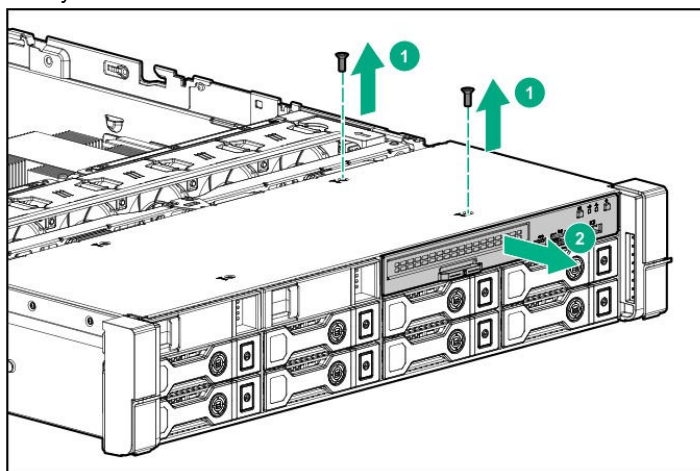
When installing the components, follow the steps below.

1. See steps 1 to 7 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Lift up the levers on both sides of fan cage, and pull the fan cage upward to dismantle it.

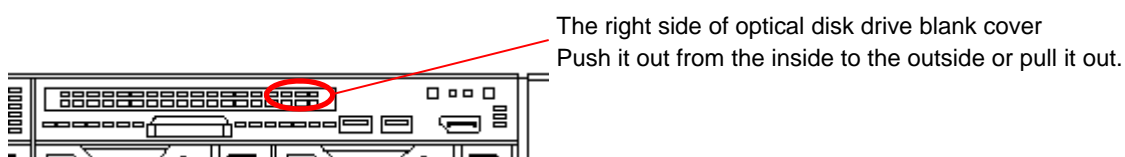


3. Disconnect the cables connected to the power switch module.  
Write down the cables disconnected and their positions.

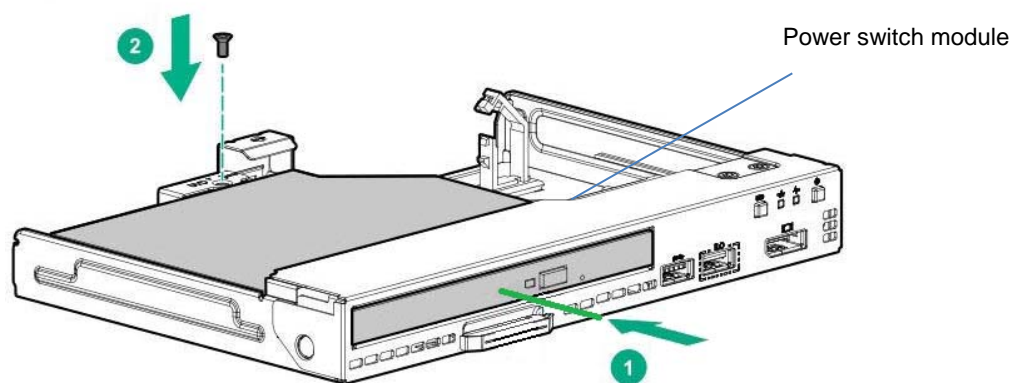
4. Unscrew the two screws fixing the power switch module and dismantle the module by pulling it toward you.



5. Dismantle the blank cover of optical disk drive by pushing out the right end of it from the inside to the outside or pulling it out.

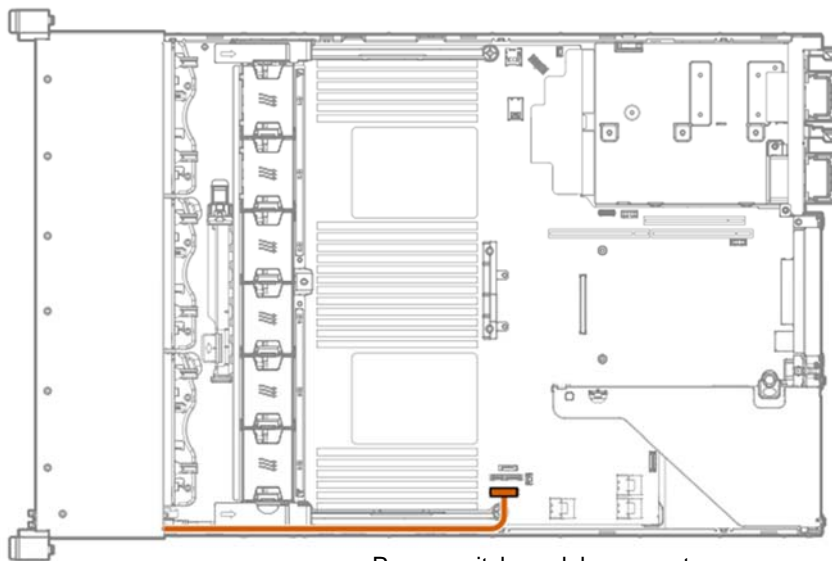


6. Insert the optical disk drive from the front and fix it with a screw.



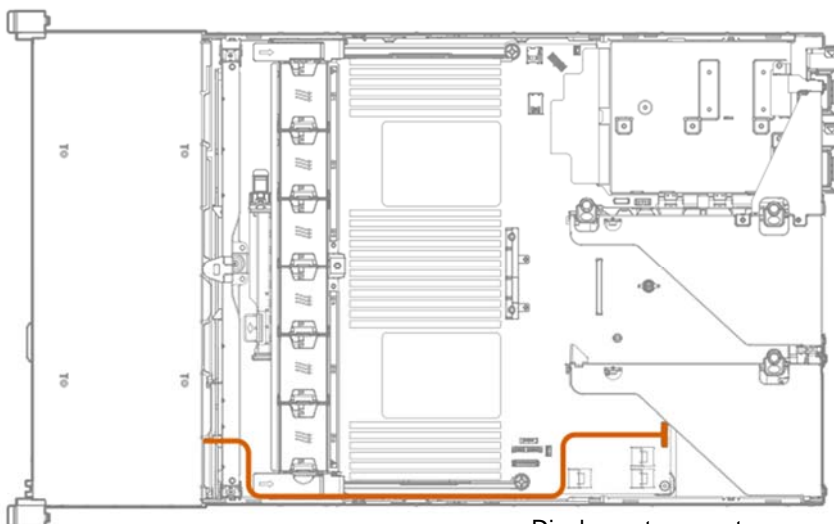
7. Insert the module attached with the optical disk drive from the front and fix them with two screws.
8. Connect the cables.
  - Connect the cables you disconnected to the initial positions.

- Connect the power switch module cable to the connector.



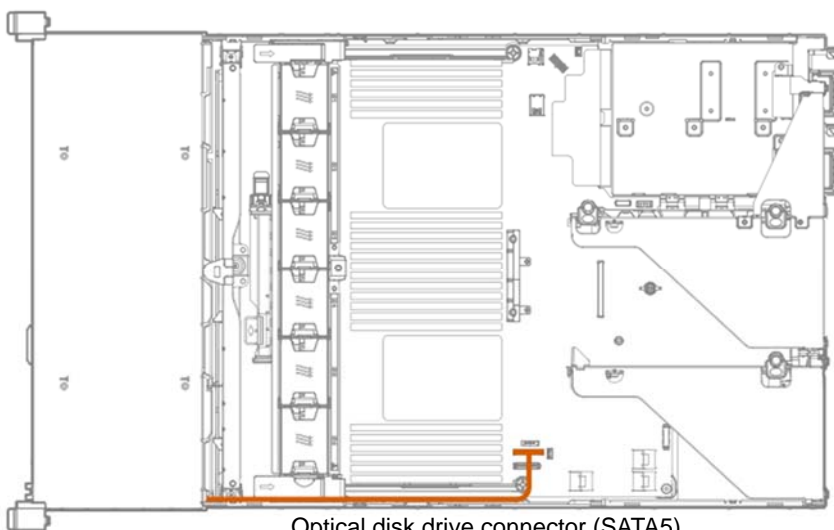
Power switch module connector

- Connect Displayport cable to the connector.



Displayport connector

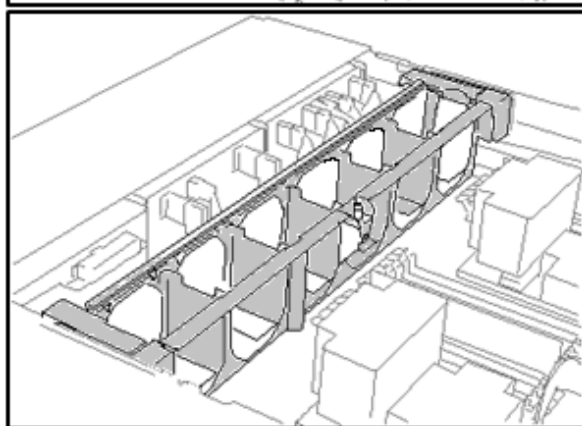
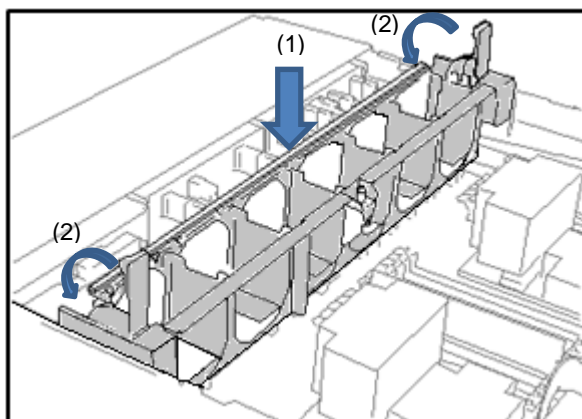
- Connect the optical disk drive cable to the connector SATA5.



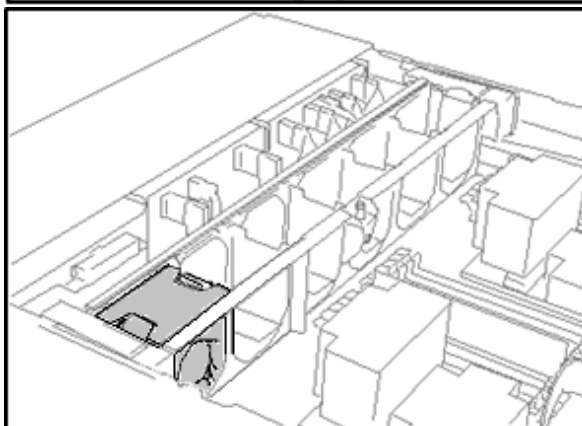
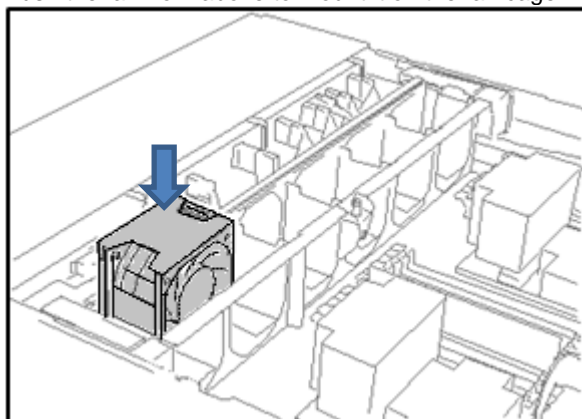
Optical disk drive connector (SATA5)

## 9. Install the fan cage.

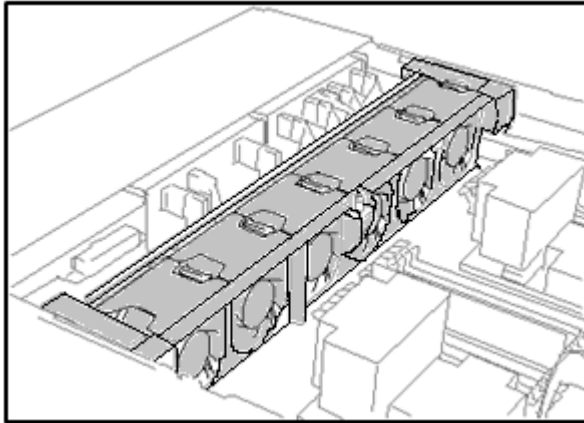
- ① Remove all the fans from the fan cage and confirm no fan is installed in the cage. Next, fit the fan cage to the device, push the cage slowly from above, and lower the levers at both sides to fix it.



- ② Push the fan from above to mount it on the fan cage.



- ③ Reinstall all the fans you removed.



10. Install the air duct referring to *Chapter 2 (1.34 Attaching the air baffle)* of this book.  
11. Install the top cover referring to *Chapter 2 (1.35 Installing Top Cover)* of this book.

**Note**

In order to prevent damage to the device due to improper cooling or an elevated temperature, do not operate the server or the enclosure without installing any of component or blank on all the drive bays and device bays.

12. Execute the installation and connection referring to "Chapter 2 (2 Installation and connection)" of this book, and then turn the power on.

### **1.22.2 Removal**

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When removing, practice the steps of installing reversely.

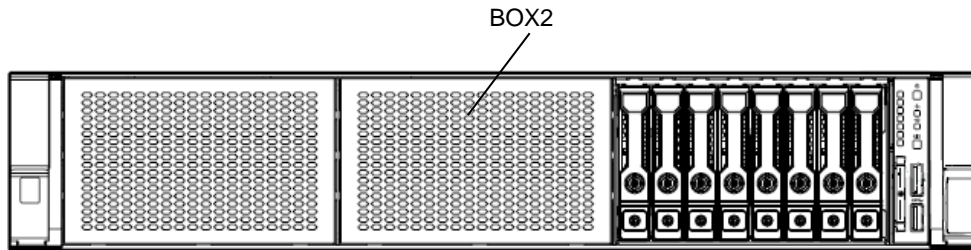
When you operate the device without components, install the blank cover that was installed on the device.

**Important**

In order to maintain the cooling effect inside, install the blank cover which you removed.

## 1.23 8x 2.5-inch Drive Cage (N8154-94)

An optional 2.5x8 drive cage may be attached to BOX 2 for 2.5x8 drive models.



### 1.23.1 Installing 8x 2.5-inch drive cage (N8154-94)

**Note**

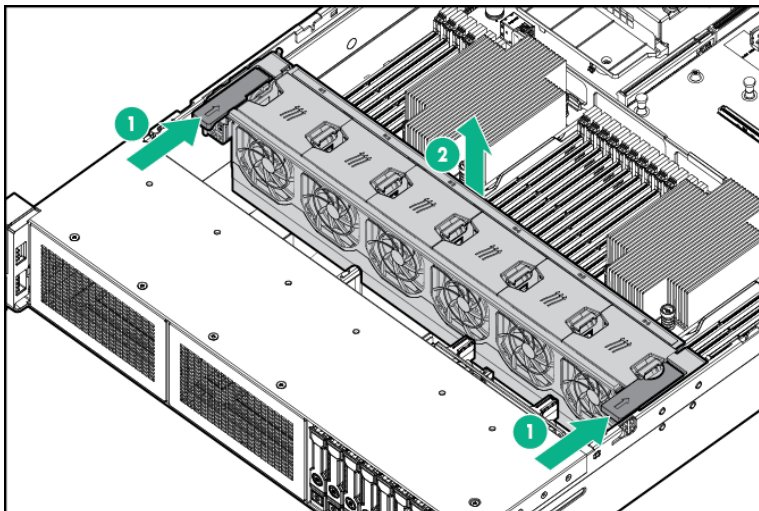
In order to prevent the damage to electronic components, please start to install the system after conducting the appropriate anti-static treatment. There is a possibility of causing electrostatic discharge if appropriate grounding wire treatment is not conducted.

Please prepare the following before installing the options.

- Parts included in the option kit
- T-10 Hexalobular driver

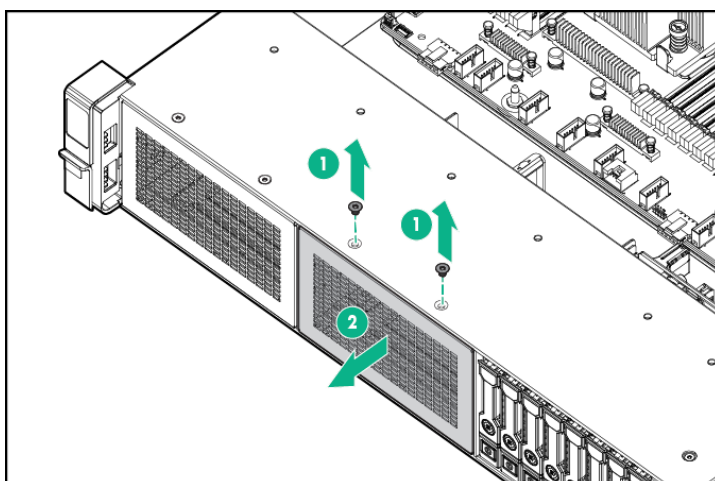
To install the components, follow these steps.

1. See steps 1 to 7 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Raise the levers on both sides of the fan cage upward, and pull the fan cage upward to remove it.



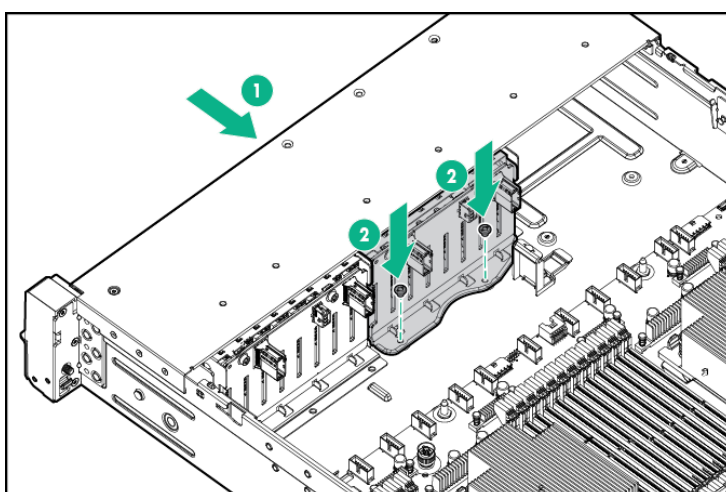


3. Unfasten the screws (x2) of the bay blank cover, and pull the blank cover forward to remove it.
  - BOX2

**Note**

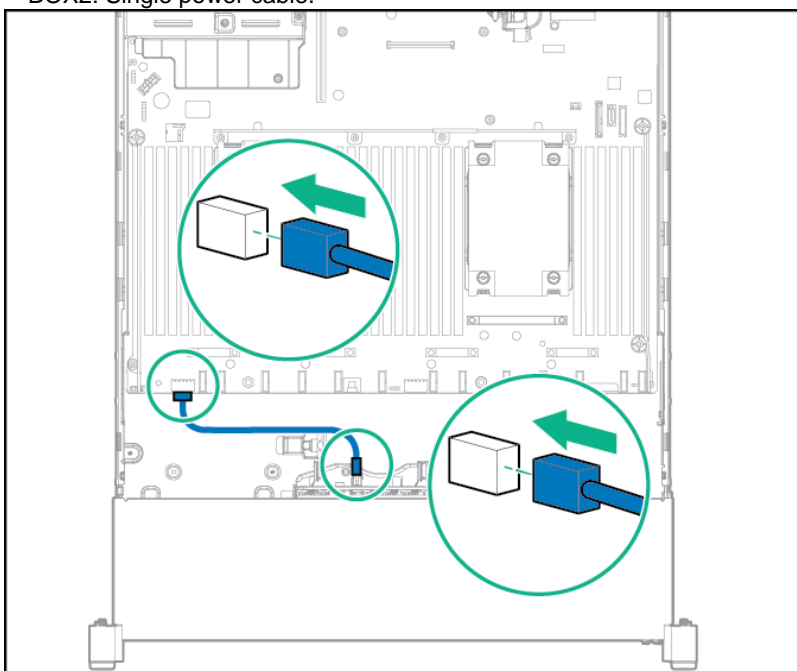
Keep each removed blank covers.

4. Insert the 8x 2.5-inch drive cage from front of the chassis, then fix it with the screws (x4).
  - BOX2



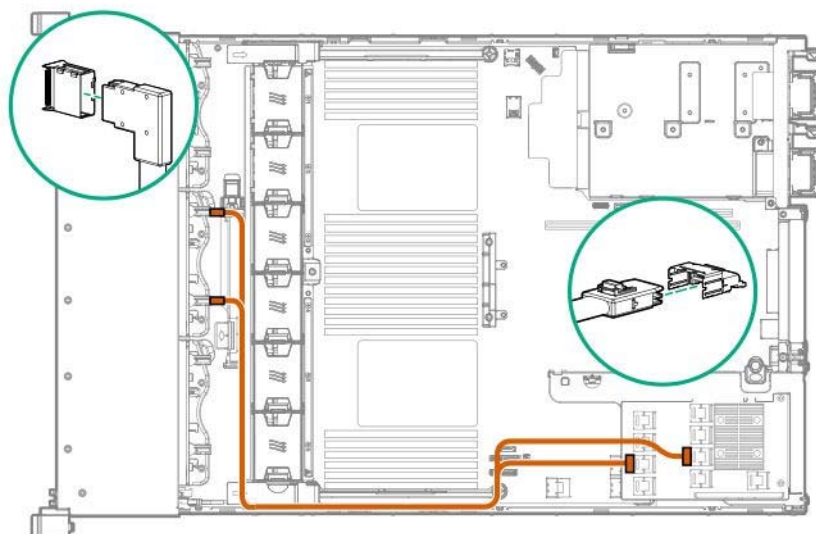
5. Connect the power cable of 8x 2.5-inch drive cage.

• BOX2: Single power cable.



6. The drive bay data cables are connected as follows.

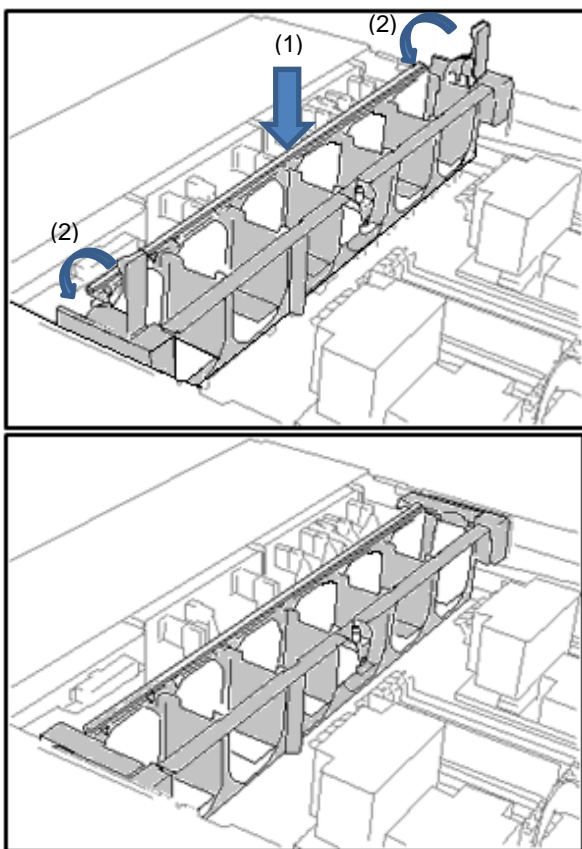
• BOX2: When connecting to 12G SAS expander card



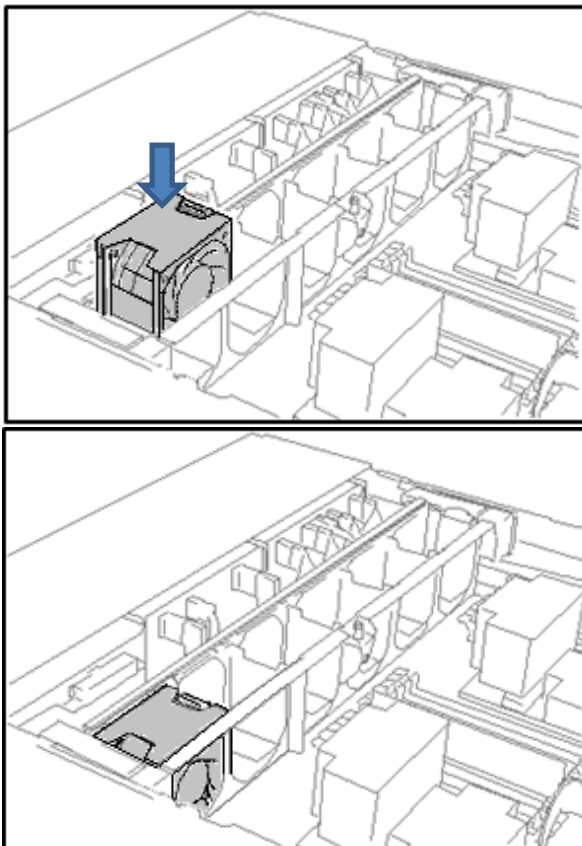


7. Remove all the fans from the fan cage to the state where only the fan cage is left.

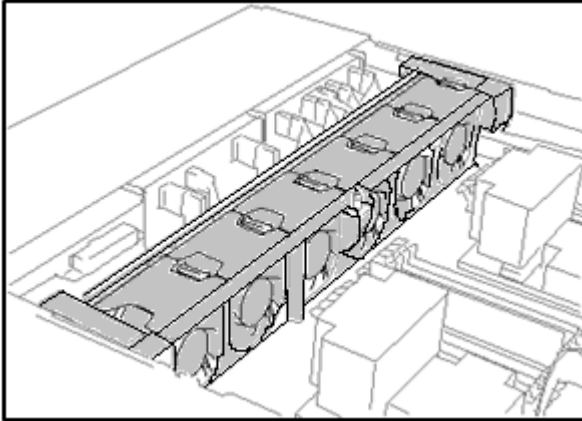
Next, align the fan cage with the device, push the cage slowly from the above direction, and tilt both sides of the levers to secure it.



8. Push the fan from the above direction to mount it in the fan cage.



9. Reinstall all the fans that have been removed earlier.



10. See *Chapter 2 (1.34 Attaching the Air Baffle)* to attach the air baffle.
11. See *Chapter 2 (1.35 Installing Top Cover)* to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

12. Please see Chapter 2 (2 Installation and Connection) in this manual to conduct installation and connection, and turn the power supply ON.

### ***1.23.2 Removal***

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The procedure for removal is the reverse of installation.

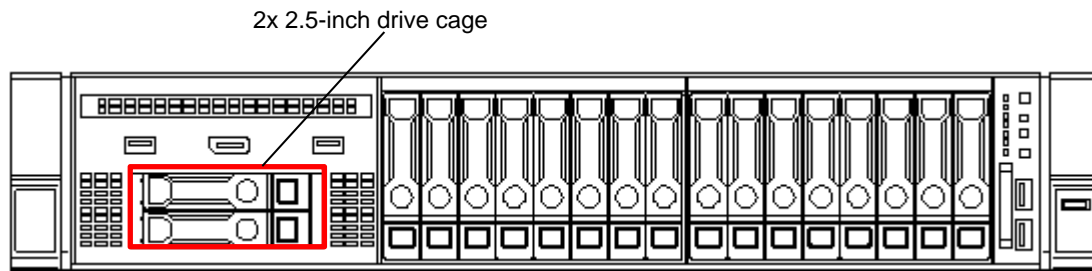
Re-attach the blank cover if you operate without it attached.

**Important**

Re-attach the blank cover removed to maintain the internal cooling.

## 1.24 Universal Media Bay 2x 2.5-inch Drive Cage

You can install an optional 2x 2.5-inch drive cage (SAS/SATA, PCIe SSD SSD) in the universal media bay.



### 1.24.1 Installing 2x 2.5-inch drive cage (N8154-95)

**Note**

In order to prevent the damage to electronic components, please start to install the system after conducting the appropriate anti-static treatment. There is a possibility of causing electrostatic discharge if appropriate grounding wire treatment is not conducted.

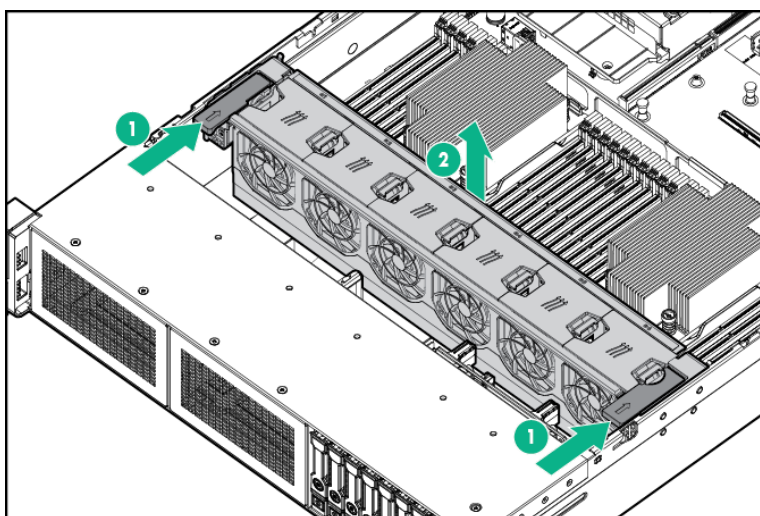
Please prepare the following before installing the options.

- Parts included in the option kit
- T-10 hexalobular driver

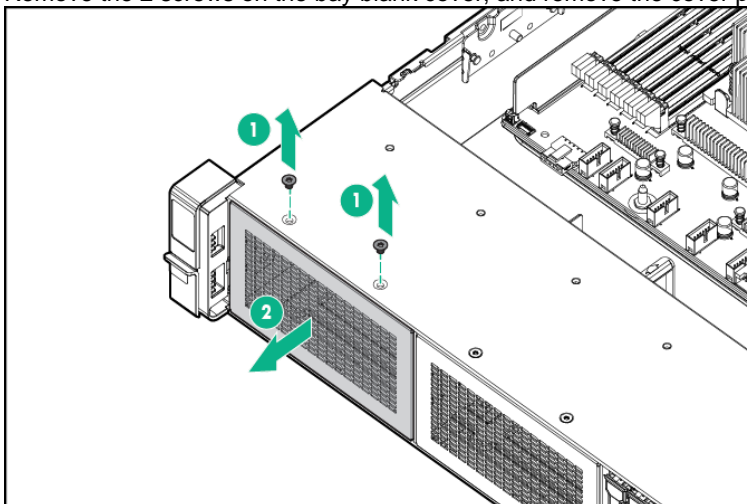
The universal media bay must be attached before attaching this option. See *Chapter 2 (1.21 8x 2.5-inch drive model Universal Media Bay / Optical Disc Drive)*.

To install the components, follow these steps.

1. Back up all data in the server.
2. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
3. Raise the levers on both sides of the fan cage, and remove it by lifting it upwards.

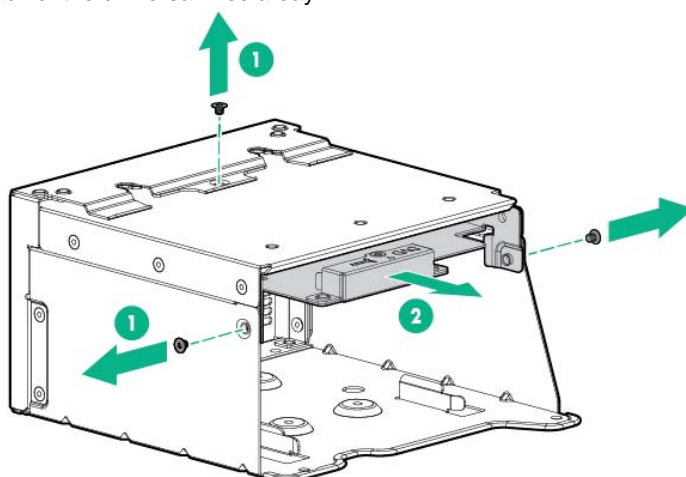


4. Remove the 2 screws on the bay blank cover, and remove the cover pulling it out forward.

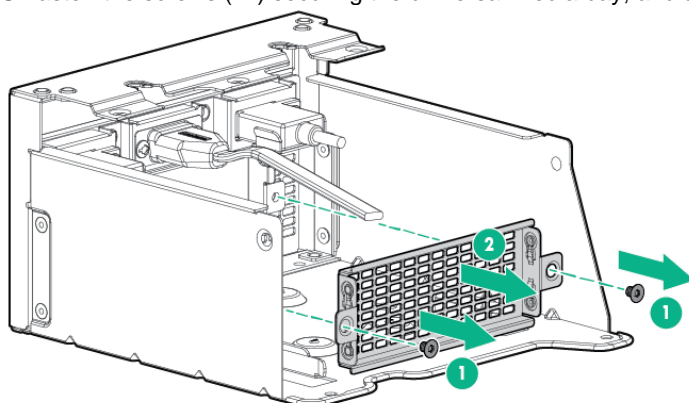
**Note**

Keep each removed blank covers.

5. Unfasten the screws (x3) securing the optical disk drive tray, and draw out and remove the tray from the back of the universal media bay.

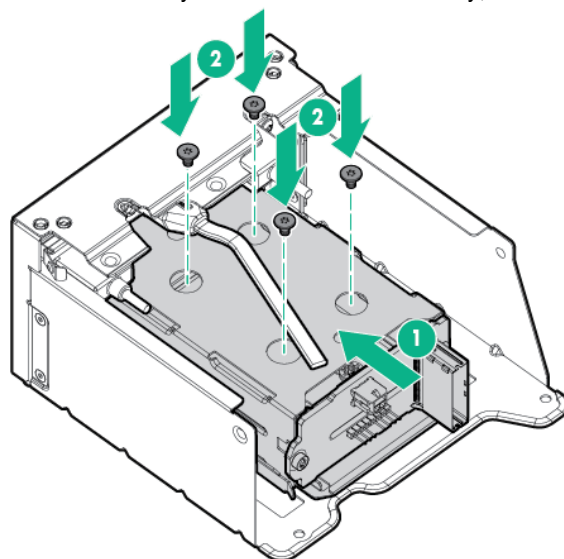


6. Unfasten the screws (x2) securing the universal media bay, and remove the blank cover.

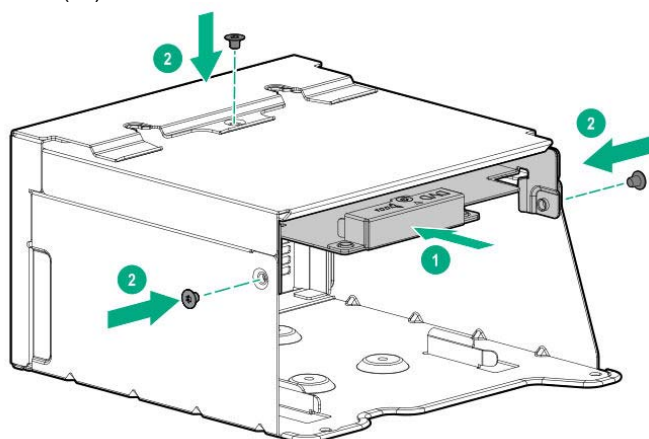
**Note**

Keep each removed blank covers.

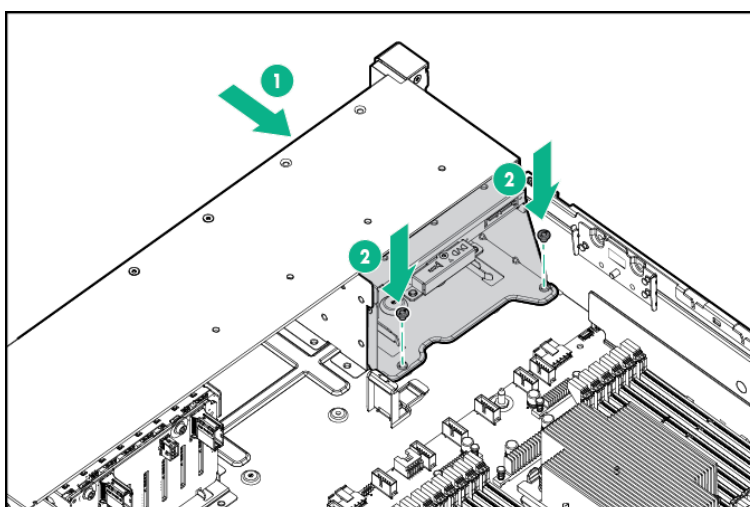
7. Attach the 2x 2.5-inch drive bay to the universal media bay, and secure it with the screws (x4).



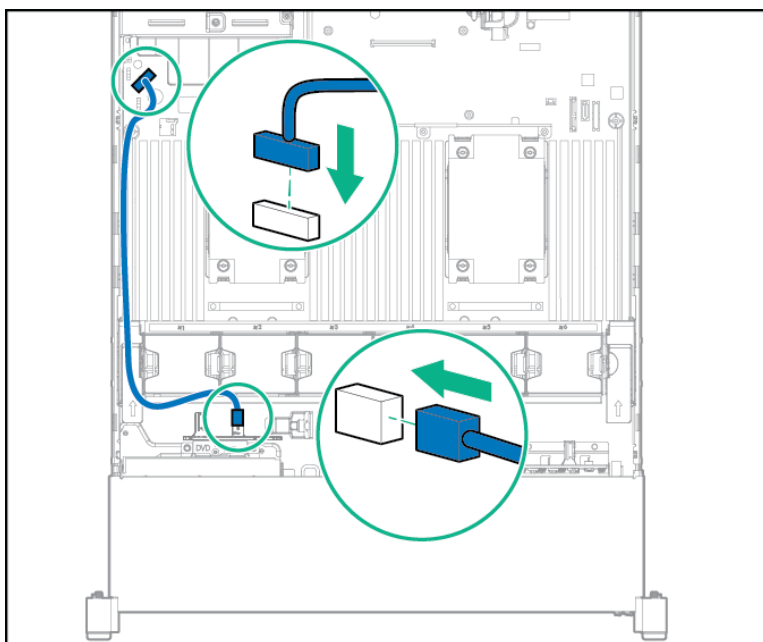
8. Insert and attach the optical disc drive tray in the universal media bay from behind, and secure it with the screws (x3).



9. Reattach the universal media bay to the chassis from the front side, and secure it with the screws (x2).

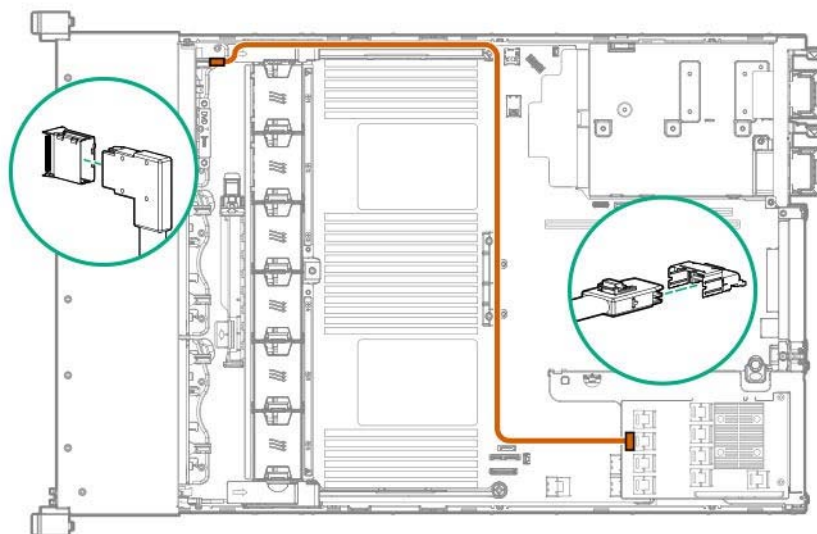


10. Connect the drive bay power cable to the power connector on the motherboard.



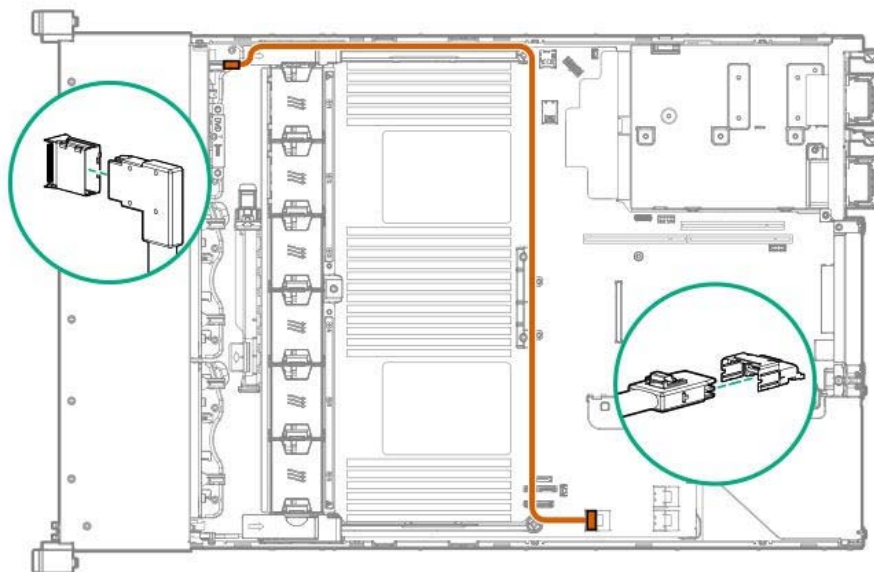
11. Connect the drive bay data cables to the inputs below.

- ① Connecting to the SAS expander for the SAS/SATA drive

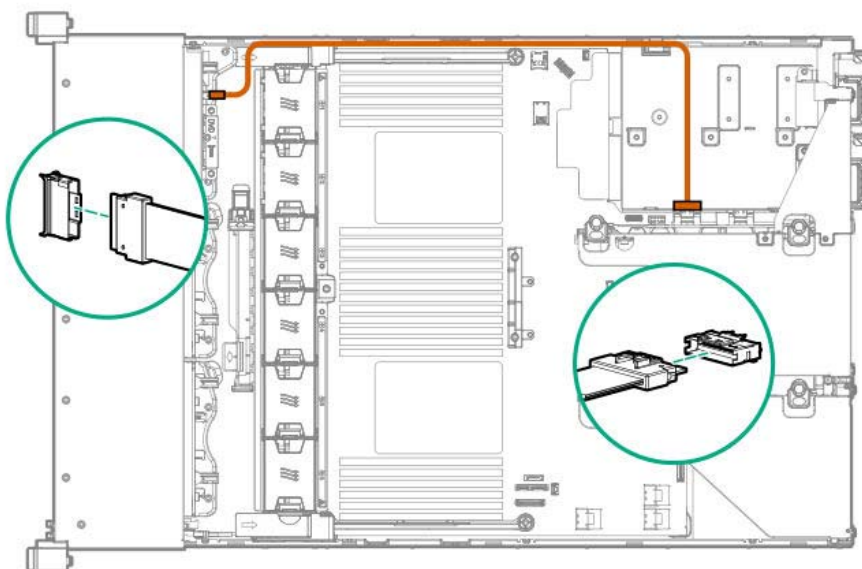




② Connecting to the on-board SATA connector for the SAS/SATA drive

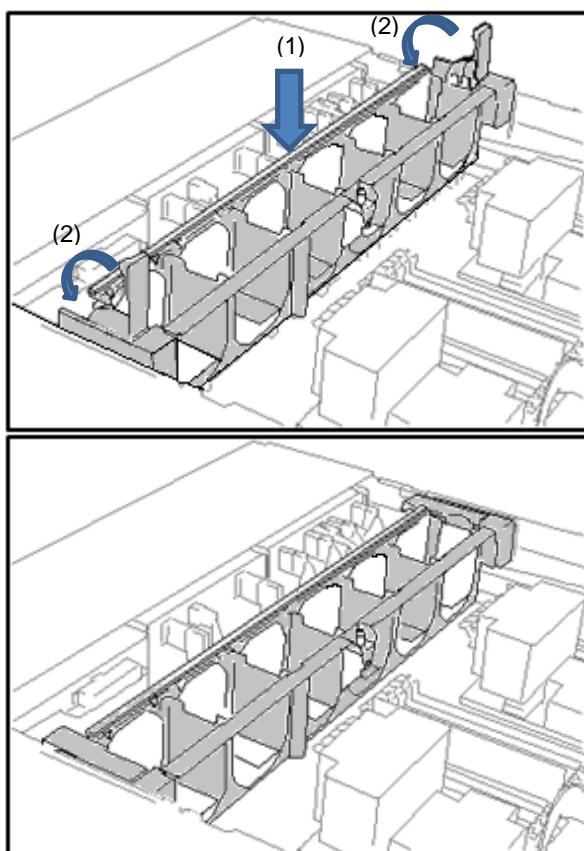


③ Connecting to the PCIe SSD riser card for the PCIe SSD drive

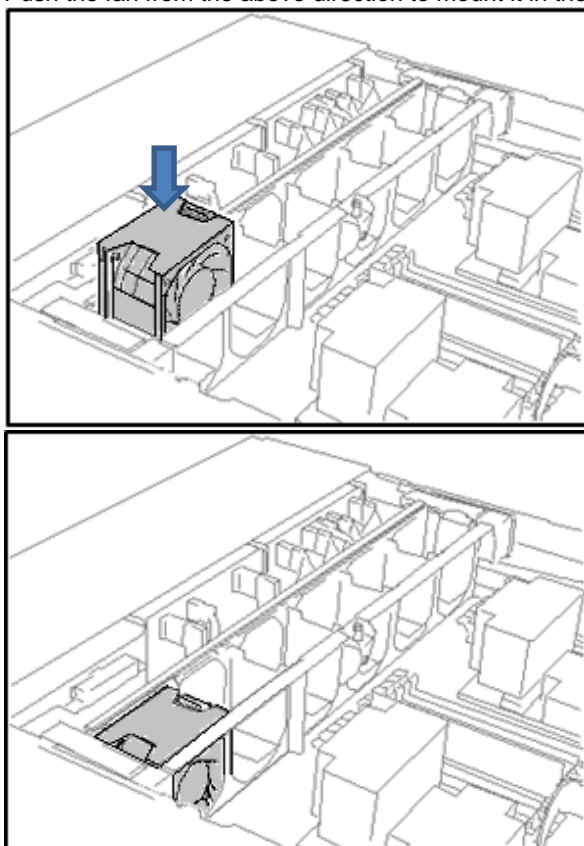


12. Remove all the fans from the fan cage to the state where only the fan cage is left.

Next, align the fan cage with the device, push the cage slowly from the above direction, and tilt both sides of the levers to secure it.

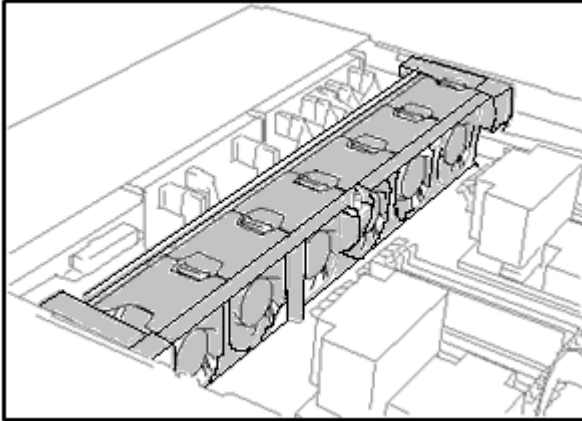


13. Push the fan from the above direction to mount it in the fan cage.





14. Reinstall all the fans that have been removed earlier.



15. See *Chapter 2 (1.34 Attaching the Air Baffle)* to attach the air baffle.
16. See *Chapter 2 (1.35 Installing Top Cover)* to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

17. Please see *Chapter 2 (2 Installation and Connection)* in this manual to conduct installation and connection, and turn the power supply ON.

### ***1.24.2 Removal***

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The procedure for removal is the reverse of installation.

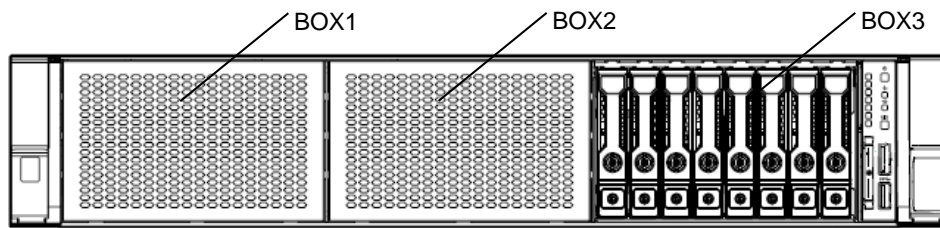
Re-attach the blank cover if you operate without it attached.

**Important**

Re-attach the blank cover removed to maintain the internal cooling.

## 1.25 8x2.5 inch (PCIe SSD) Drive Cage (N8118-310)

This drive cage can be installed in any type of BOX1/2/3. The procedure for installing the drive cage to the BOX 1 is described here.



Notes:

- When installing this drive cage in BOX2 and BOX3, it's necessary to install SAS/SATA drive in BOX1.
- When installed to the BOX 1, the riser card needs to be installed in the tertiary PCIe slot.
- When installed to the BOX 2, the riser card needs to be installed in the secondary PCIe slot.
- When installed to the BOX 3, the riser card needs to be installed in the primary PCIe slot.

### 1.25.1 Installing PCIe SSD Drive Cage

Prerequisites

When installing this option, a relevant PCIe SSD riser card and a high-performance fan are also required.

To install the components, follow these steps.

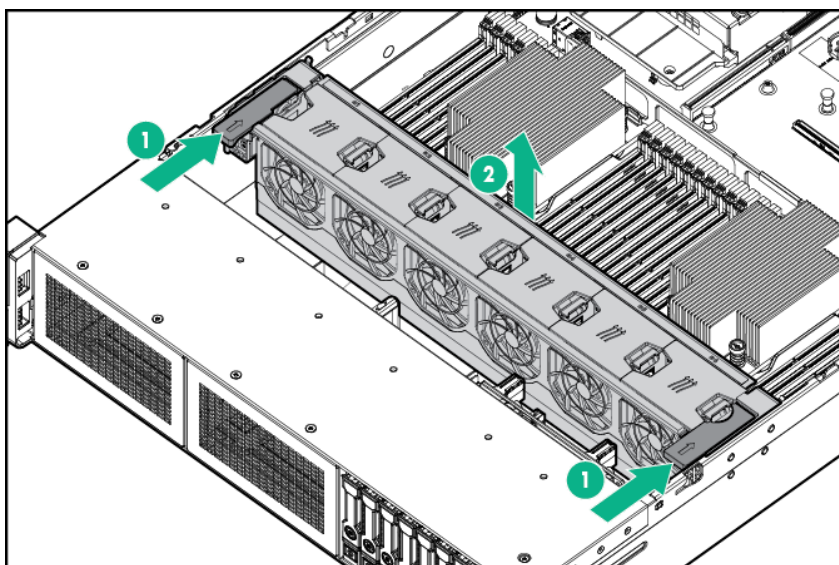
#### Important

The surface becomes hot after use so to avoid burns please allow the drive and internal parts of the system to cool before touching.

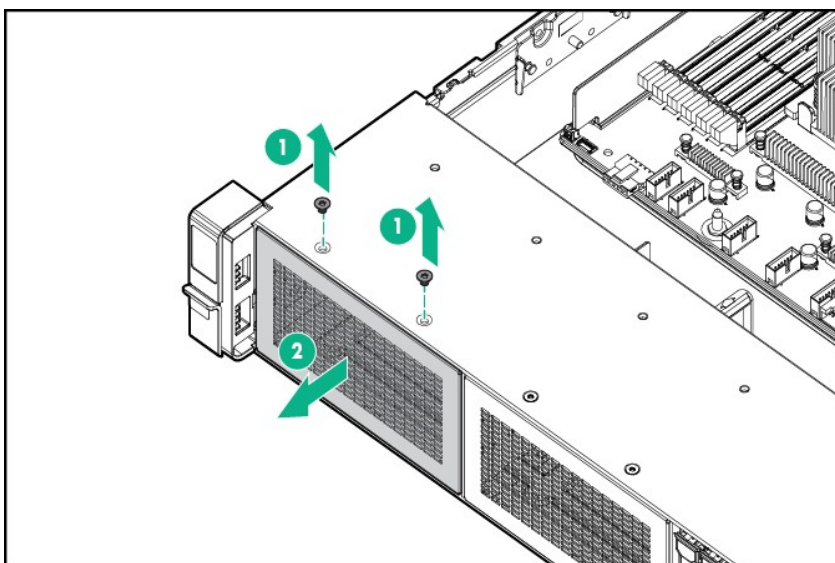
#### Note

In order to prevent the damage to electronic components, please start to install the system after conducting the appropriate anti-static treatment. There is a possibility of causing electrostatic discharge if appropriate grounding wire treatment is not conducted.

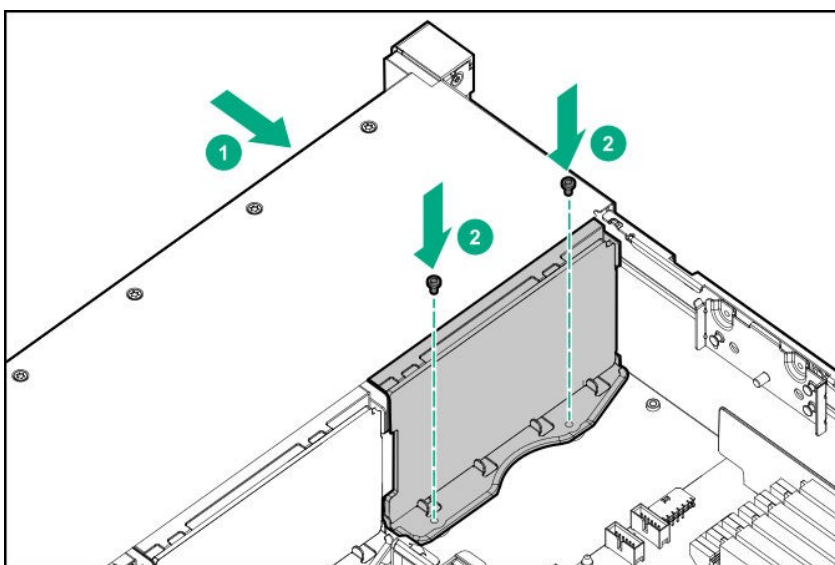
1. See steps 1 to 7 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Raise the levers on both sides of the fan cage, and remove it by lifting it upwards.



3. Remove the 2 screws on the BOX blank cover, and remove the cover pulling it out forward.



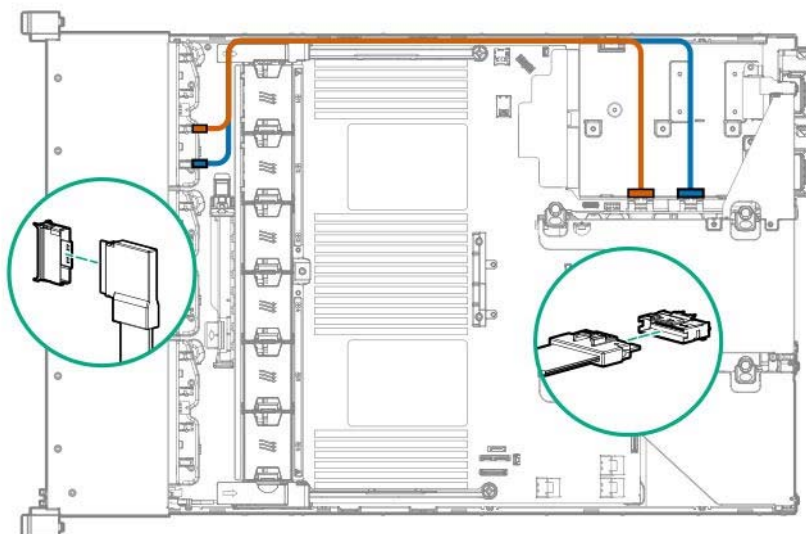
4. Remove all the drives or dummy trays, if those are mounted in the drive cage.  
After making the drive cage empty, insert the PCIe SSD drive cage from the front side and secure it with the screws (x2).



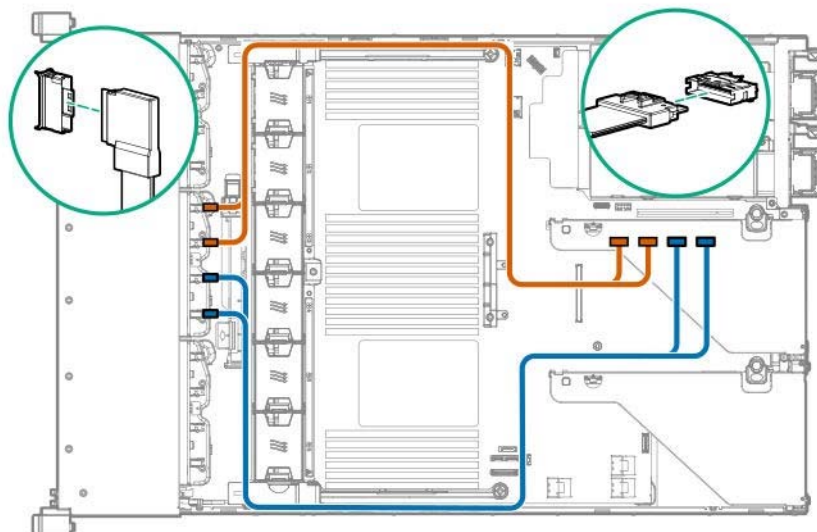
5. Install the relevant PCIe SSD riser card.
6. Connect the power cable from the drive back plane to the motherboard.

7. Connect the data cable from the PCIe SSD drive back plane to the motherboard.

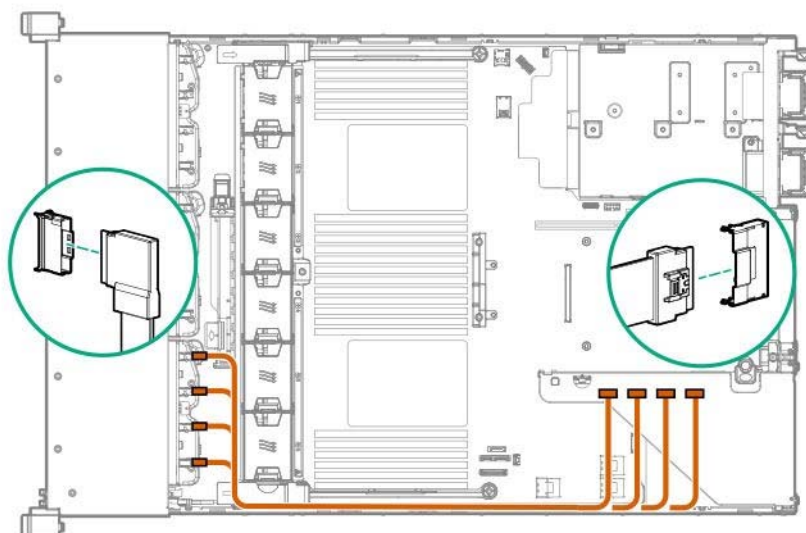
- Connecting from BOX 1 to PCIe SSD riser card



- Connecting from BOX 2 to PCIe SSD riser card

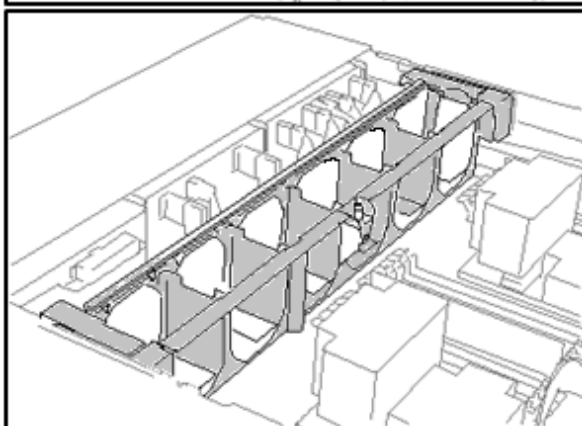
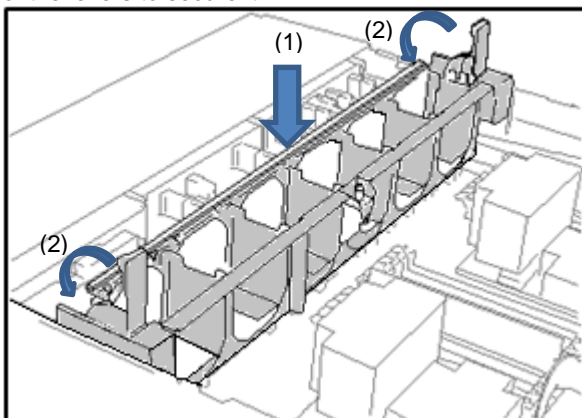


- Connecting from BOX 3 to PCIe SSD riser card

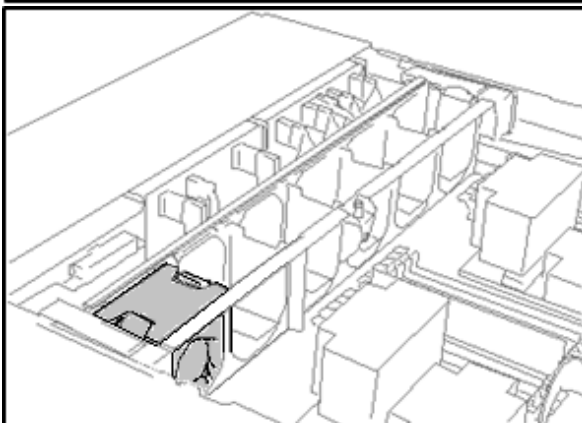
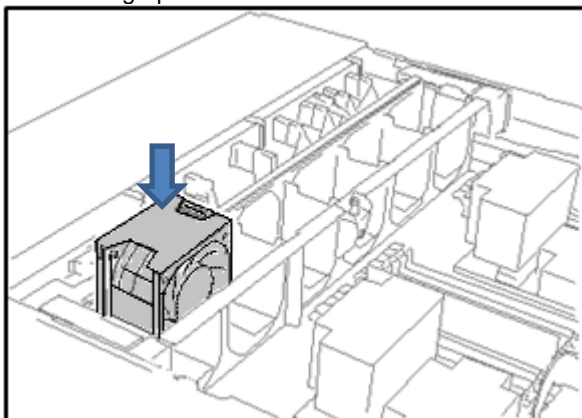


8. Remove all the fans from the fan cage to the state where only the fan cage is left.

Next, align the fan cage with the device, push the cage slowly from the above direction, and tilt both sides of the levers to secure it.

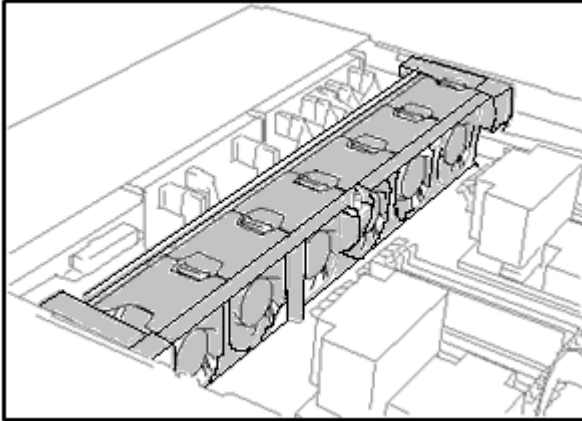


9. Push the high-performance fan from the above direction to mount it in the fan cage.





10. Install all the high-performance fans.



11. See *Chapter 2 (1.35.4 Removing the PCIe SSD Drive)* to attach the air baffle.
12. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

**Note**

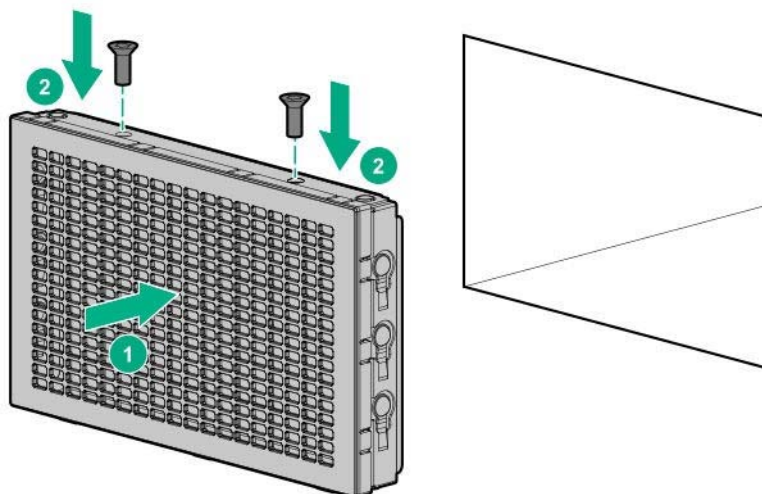
In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

13. Install the drive or the dummy tray.
14. Please see *Chapter 2 (2 Installation and connection)* in this manual to conduct installation and connection, and turn the power supply ON.

### 1.25.2 Affixing ventilation labels

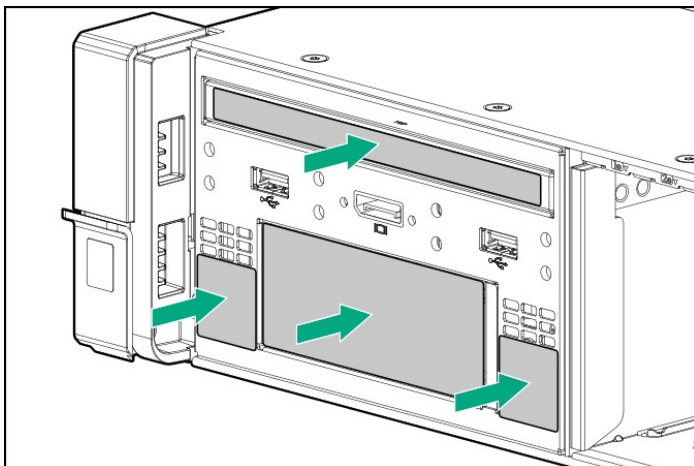
When the PCIe SSD drive cage is installed, this air flow label will be required.

- If the BOX 1 is installed with an optional 8x 2.5-inch front drive cage, no further setting is required.
- If the BOX 1 is blank, replace it with the blank of the kit.

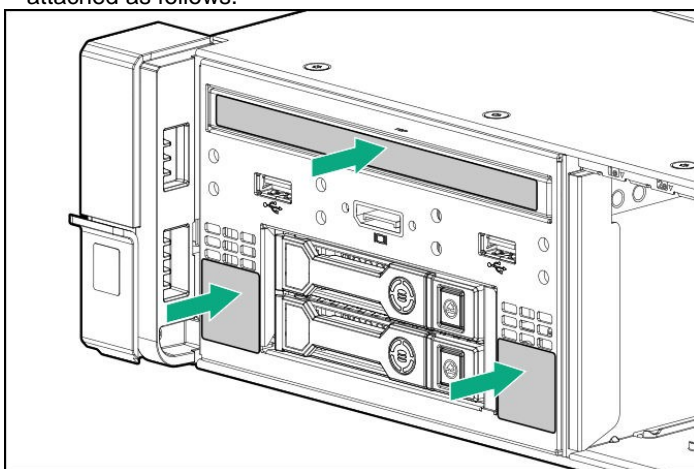


If a universal media bay is installed in the BOX 2, follow the instructions below.

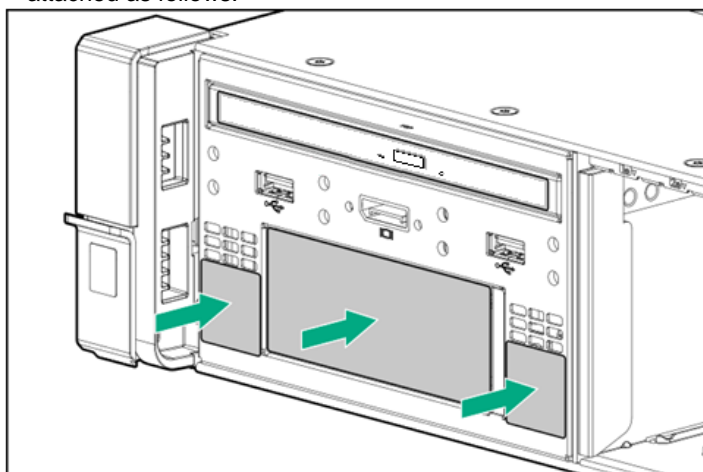
- If neither the 2x 2.5-inch drive cage nor the optical disk drive is installed, the ventilation label must be attached as follows.



- If neither the 2x 2.5-inch drive cage nor the optical disk drive is installed, the ventilation label must be attached as follows.



- If neither the optical disk drive nor the 2x 2.5-inch drive cage is installed, the ventilation label must be attached as follows.



### 1.25.3 Removal

The procedure for removal is the reverse of installation.

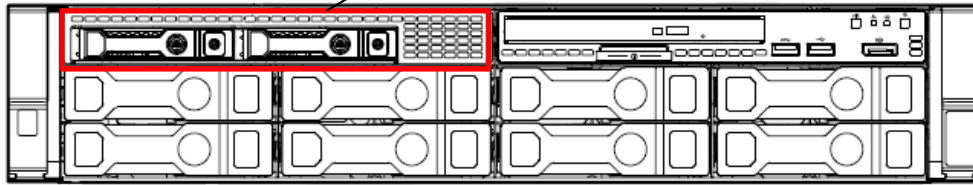
Re-attach the blank cover if you operate without it attached.

**Important** Re-attach the blank cover removed to maintain the internal cooling.

## 1.26 8x 3.5 inch drive model front 2x 2.5 inch drive cage

You can install an optional front 2x 2.5 inch drive cage (SAS/SATA, NNMe) on 8x 3.5 inch drive model.

Front 2 x 2.5-inch drive cage



### 1.26.1 Front 2x 2.5 inch (SAS/SATA) drive cage (N8154-96) Installing (PCIe SSD) drive cage (N8118-317)

**Note**

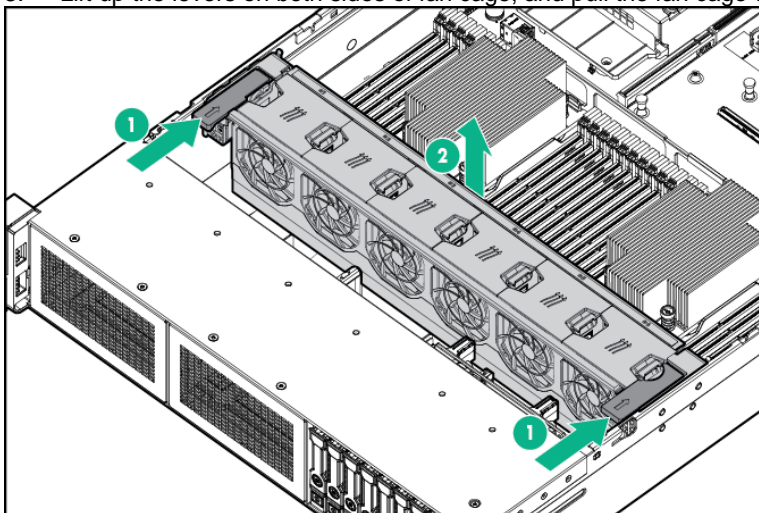
In order to prevent the damage for the electronic parts, start the installation of system after providing proper anti-static treatment. If a proper earth is not provided, electrostatic discharge may occur.

Before installing the option, prepare the followings.

- Parts included in the optional kit
- T-10 hexalobular driver

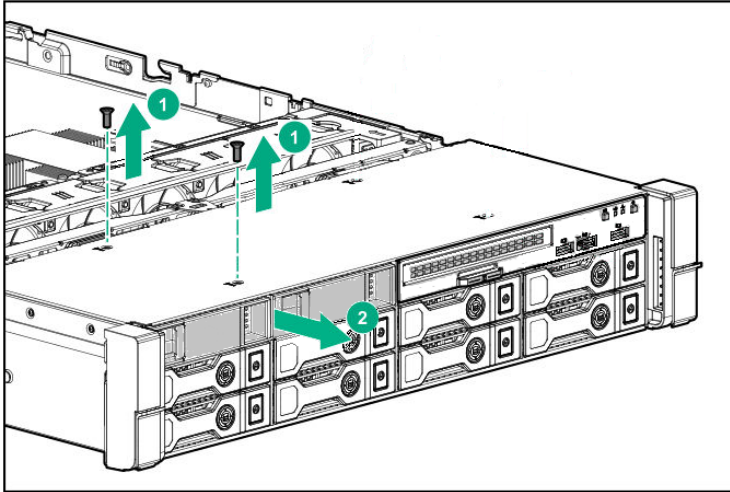
When installing the components, follow the steps below.

1. Back up all the data of server.
2. See steps 1 to 7 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
3. Lift up the levers on both sides of fan cage, and pull the fan cage upward to dismantle it.

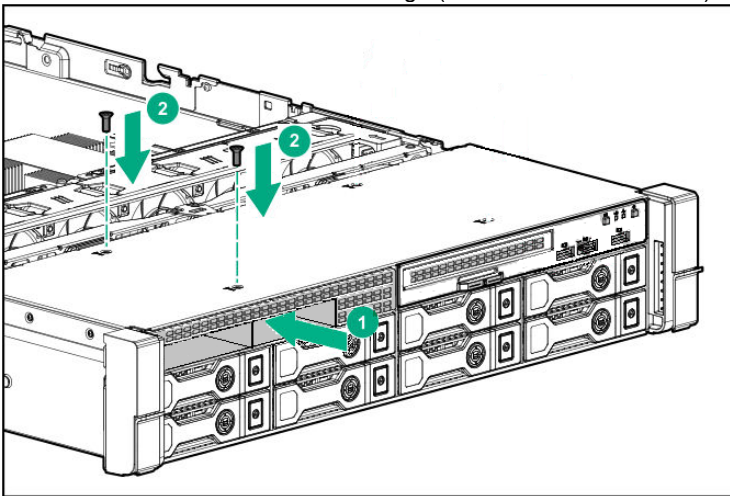




4. Remove the two screws fixing the blank cover and pull the blank cover toward you to dismantle it.

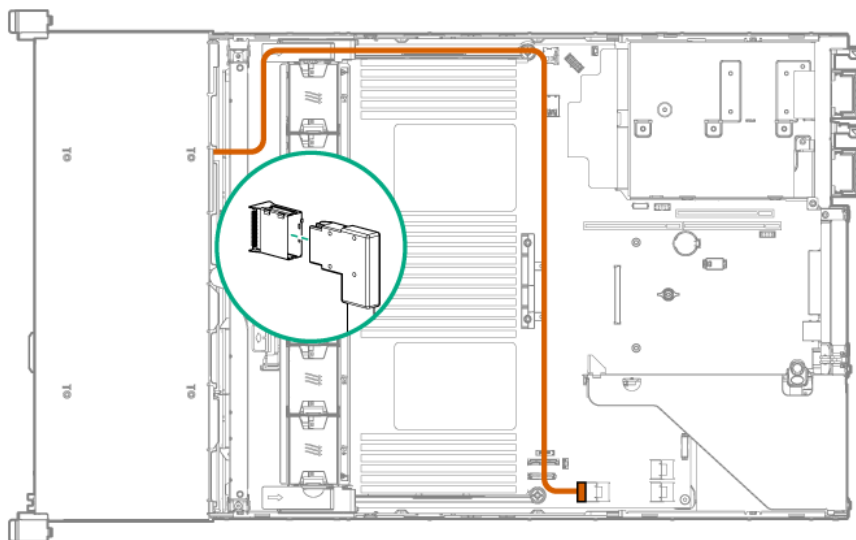


5. Insert a front 2x 2.5 inch drive cage (N8154-96 or N8118-317) from the front and fix them with two screws.

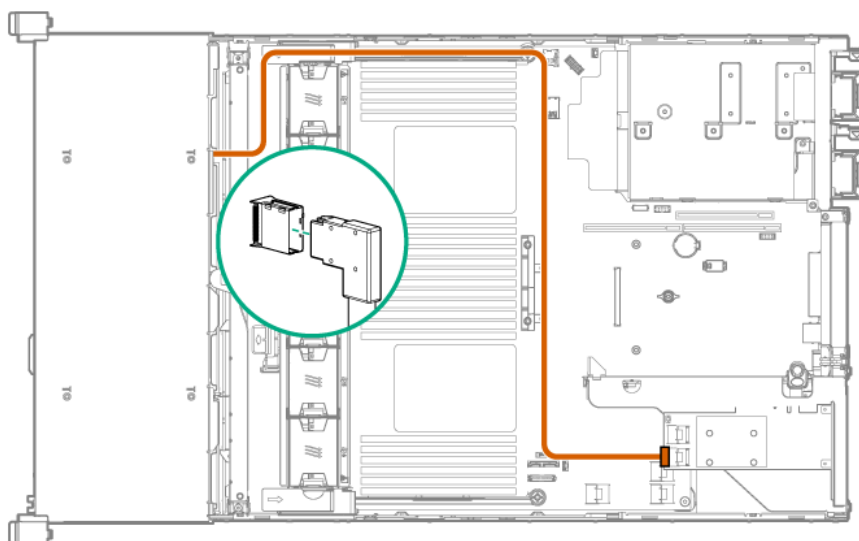


6. Connect the power cable of a front 2x 2.5 inch drive cage (N8154-96 or N8118-317).
7. Connect the data cable of front 2x 2.5 inch drive cage (N8154-96 or N8118-317) as below in the circumstance.

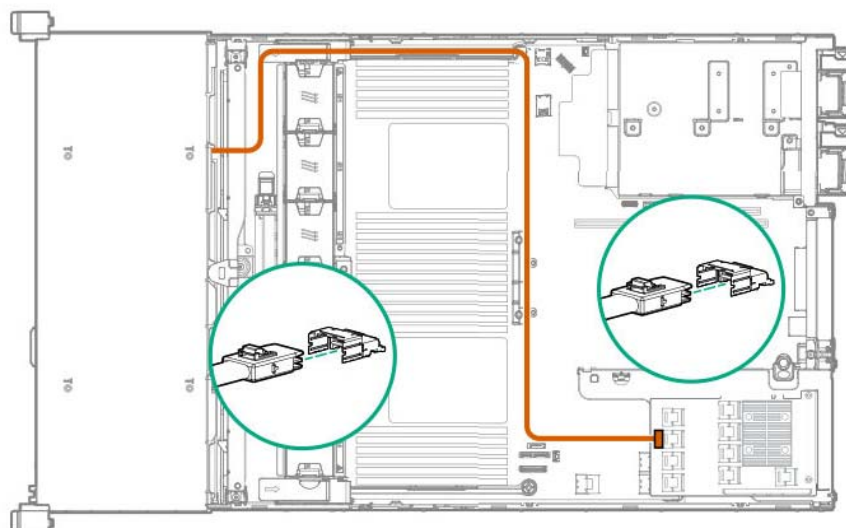
- ① Connecting to SAS/SATA drive cage (N8154-96) and the mother board



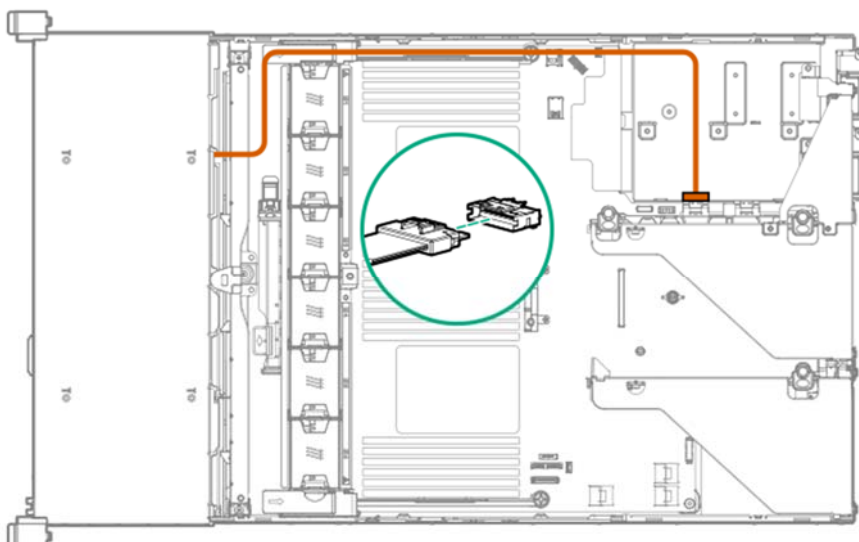
- ② Connecting to SAS/SATA drive cage (N8154-96) and RAID controller



- ③ Connecting to SAS/SATA drive cage (N8154-96) and SAS expander

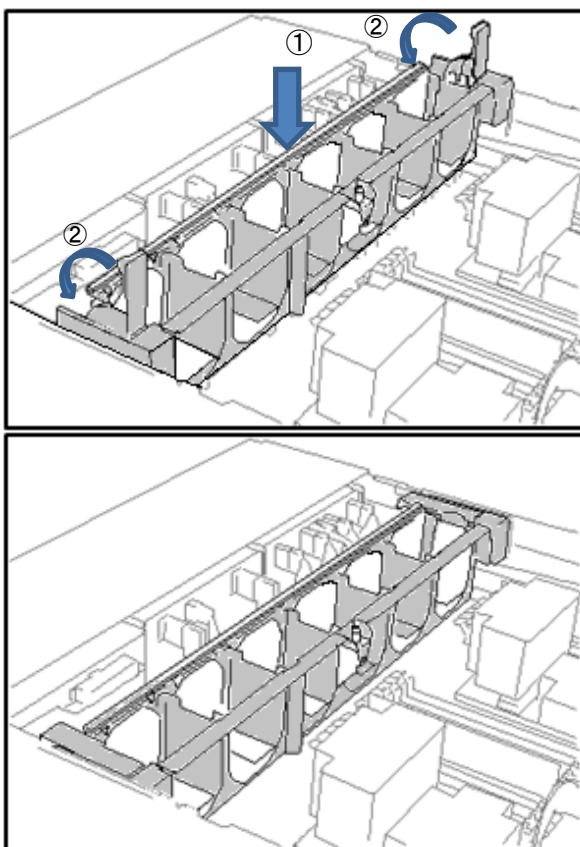


- ④ Connecting to PCIe SSD drive cage (N8118-317) and PCIe SSD riser card

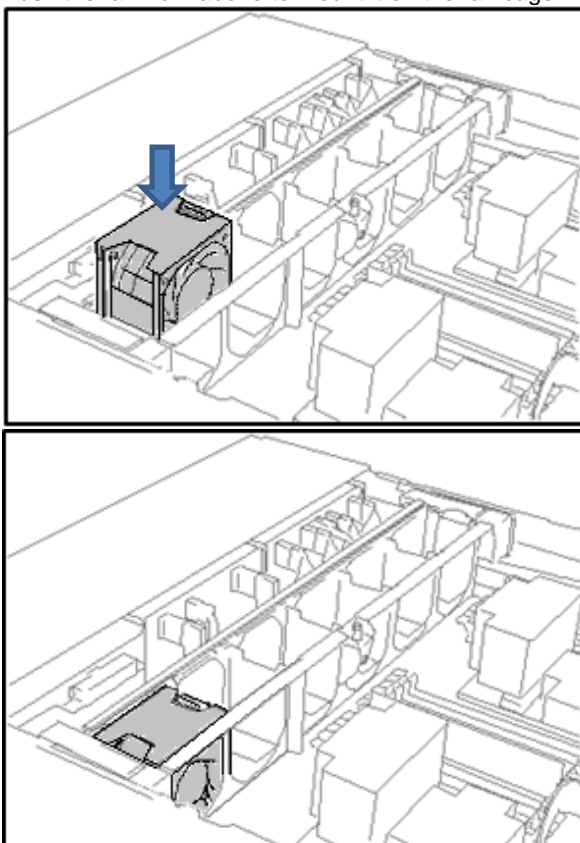


8. Remove all the fans from the fan cage and confirm no fan is installed in the cage.

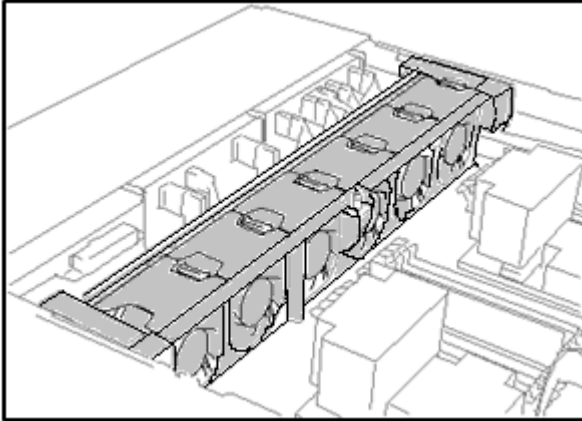
Next, fit the fan cage to the device, push the cage slowly from above, and lower the levers at both sides to fix it.



9. Push the fan from above to mount it on the fan cage.



10. Reinstall all the fans you removed.



11. Install the air duct referring to *Chapter 2 (1.34 Attaching the air baffle)* of this book.
12. Install the top cover referring to *Chapter 2 (1.35 Installing Top Cover)* of this book.

**Note**

In order to prevent damage to the device due to improper cooling or an elevated temperature, do not operate the server or the enclosure without installing any of component or blank on all the drive bays and device bays.

13. Execute the installation and connection referring to "Chapter 2 (2 Installation and connection)" of this book, and then turn the power on.

## 1.26.2 Removal

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When removing, practice the steps of installing reversely. When you operate the device without components, install the blank cover that was installed on the device.

**Important**

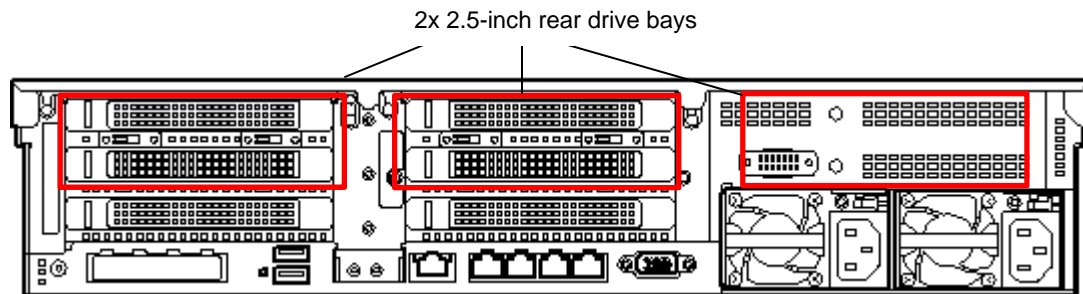
To prevent personal injury, electrical shock or equipment damage, unplug the power cord and ensure no power is supplied to the server. You cannot turn off the system power supply completely by the power button on the front panel. Until the AC power cord is unplugged, the power supply circuit is still active in some parts of the machine.

---

## 1.27 2x 2.5-inch Rear Drive Riser Card N8154-95/98

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The unit can be added with a 2x 2.5-inch drive cage on its rear side. When installing a rear drive cage, the 12x 3.5-inch drive or the 24x 2.5-inch drive must be fully installed in the front bay.



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### 1.27.1 Installing Primary/Secondary Riser Drive Cage (N8154-98)

---

**Important**

To prevent personal injury, electrical shock or equipment damage, unplug the power cord and ensure no power is supplied to the server. You cannot turn off the system power supply completely by the power button on the front panel. Until the AC power cord is unplugged, the power supply circuit is still active in some parts of the machine.

Please prepare the following before installing the options.

- Parts included in the option kit
- T-10 Hexalobular driver

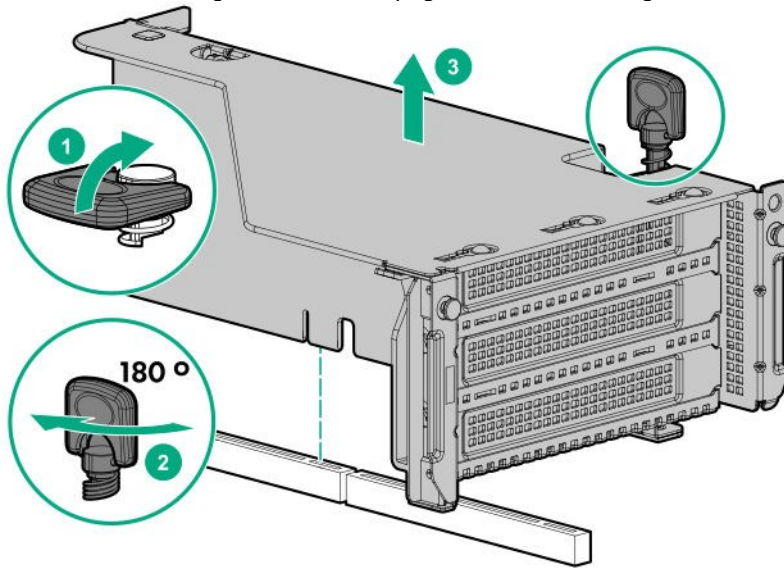
High performance fans should be installed on all the fan bays.

To install the components, follow these steps.

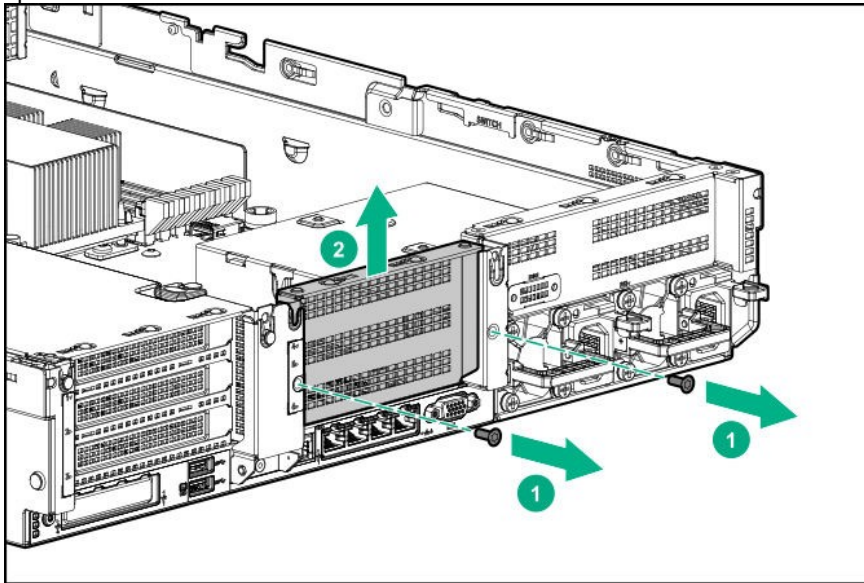
1. Back up all data in the server.
2. See steps 1 to 6 in Chapter 2 (1.2 Overview of Installation and Removal) for preparations.

3. In case of primary riser, remove the mounted riser card.

Raise the screw handles at the top of the primary riser card and turn them to the left 180 degrees. Then hold both sides of cage and lift them upright to remove the cage.



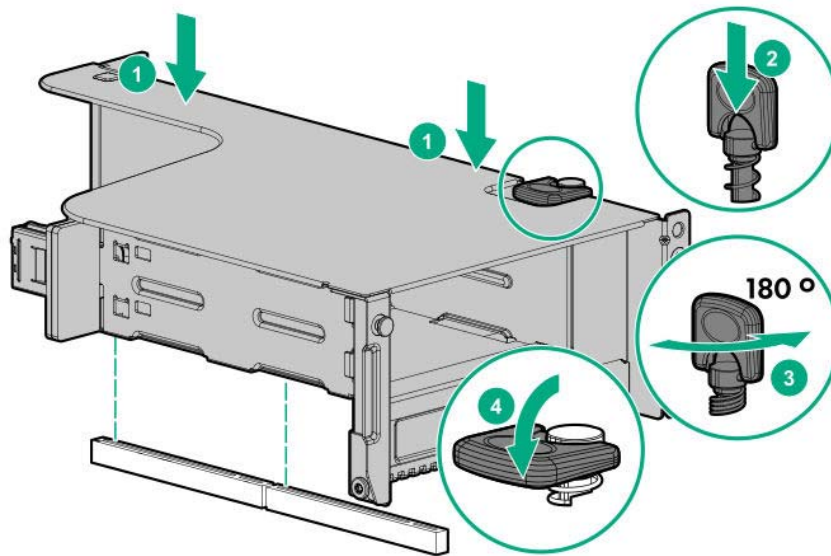
4. In case of secondary riser, unfasten the screws (x2) securing the rear blank cover, and pull the blank cover upward to remove it.



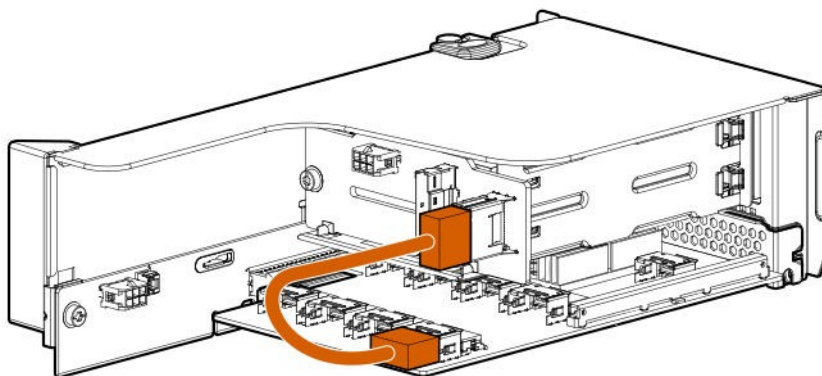
5. Install a RAID controller PCI board or an SAS expander, if necessary.



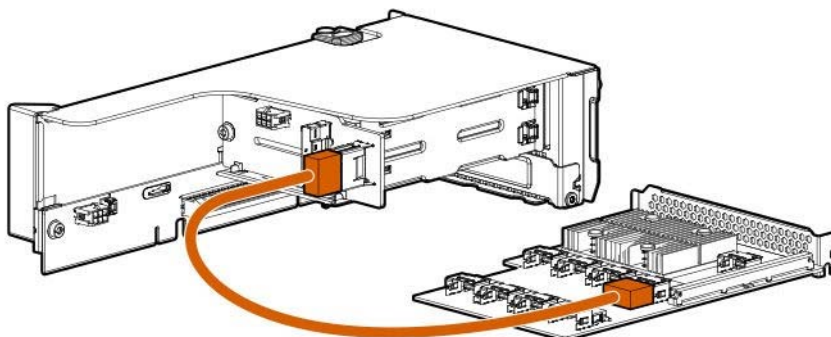
6. Fit the terminal of riser card of the rear drive cage to the slot on the mother board and insert the terminal firmly into the slot. Then fix the riser card. Next, raise the screw handle at the top of the cage and turn the handle to the right 180 degrees to fix the cage. Then put down the screw handle as before.



7. Connect the power cord and the data cable of the backplane of rear drive cage.
- Connecting the primary drive cage backplane with SAS expander.



- Connecting the secondary drive cage backplane with SAS expander.



8. Attach a drive or a dummy tray.



9. See Chapter 2 (1.34 Installing Top Cover) to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

10. Please see *Chapter 2 (2 Installation and Connection)* in this manual to conduct installation and connection, and turn the power supply ON.

### 1.27.2 Installing the Tertiary Riser Drive Cage (N8154-95)

**Important**

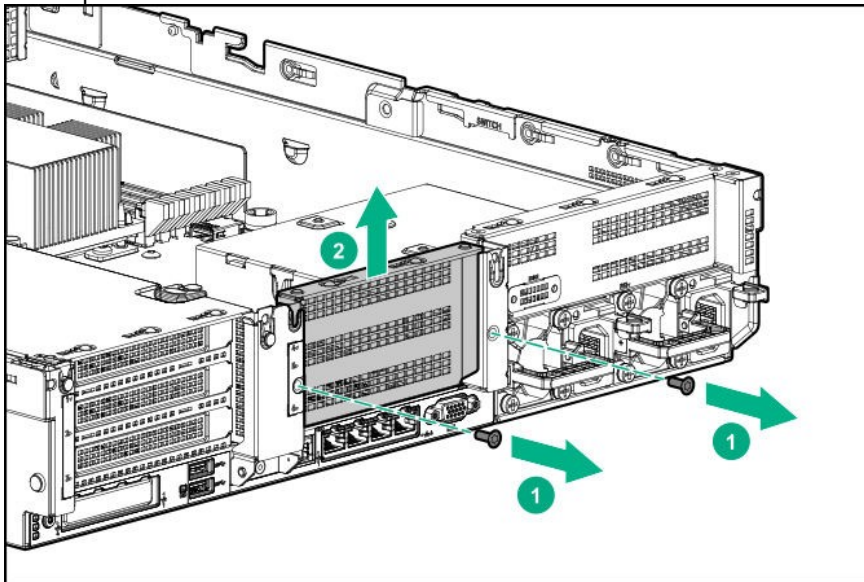
To prevent personal injury, electrical shock or equipment damage, unplug the power cord and ensure no power is supplied to the server. You cannot turn off the system power supply completely by the power button on the front panel. Until the AC power cord is unplugged, the power supply circuit is still active in some parts of the machine.

Please prepare the following before installing the options.

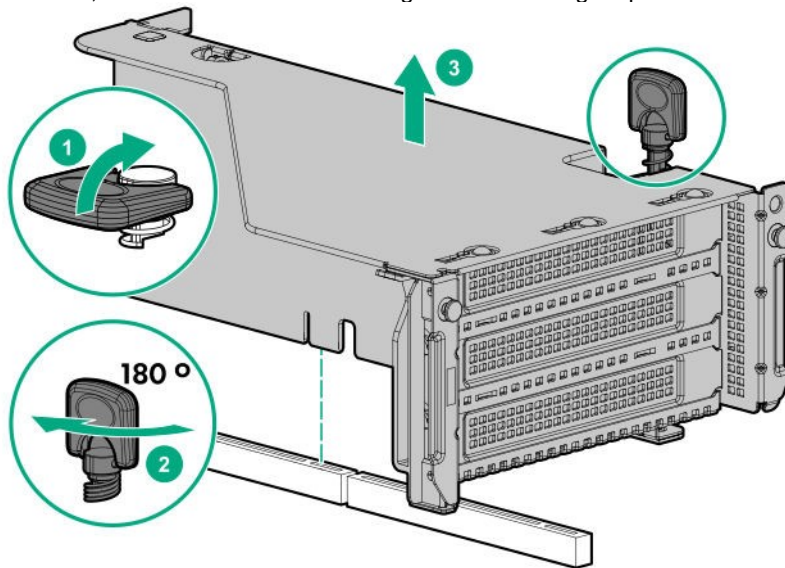
- Parts included in the option kit
- T-10 hexalobular driver

To install the components, follow these steps.

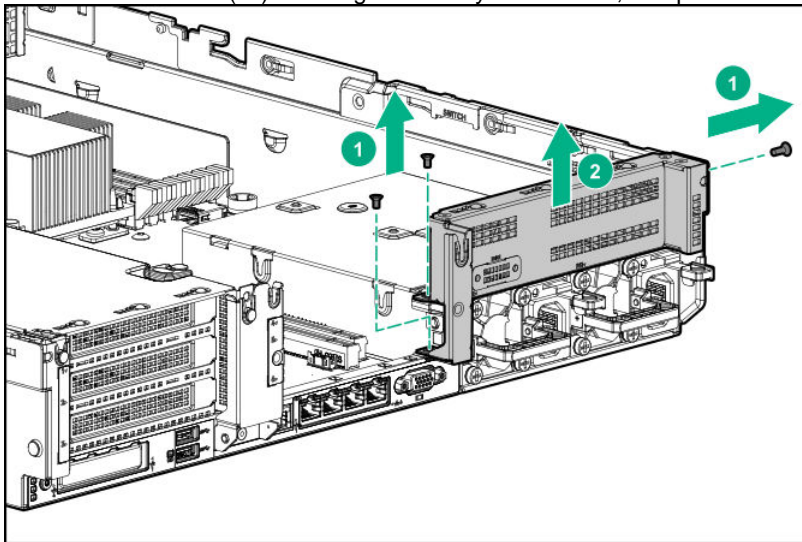
1. See steps 1 to 6 in Chapter 2 (1.2 Overview of Installation and Removal) for preparations.
2. If there is no secondary riser card, unfasten the screws (x2) securing the blank cover, and pull the blank cover upward to remove it.



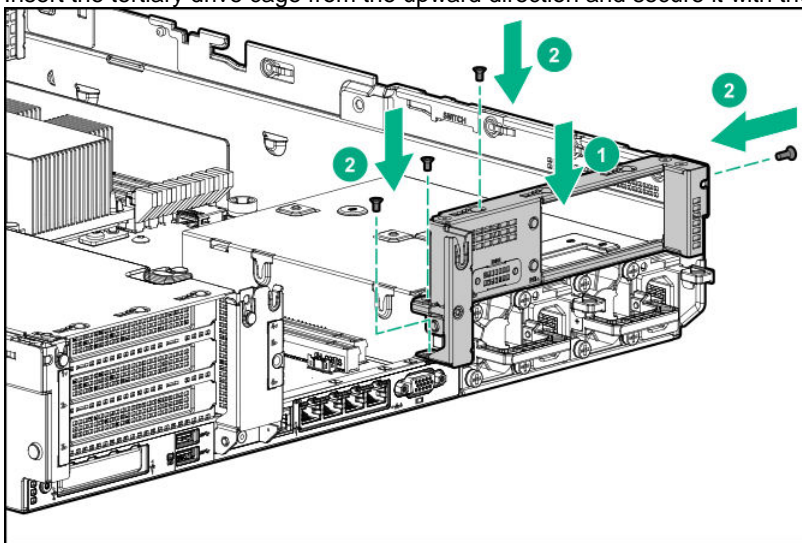
If the secondary riser card is mounted, raise the screw handle at the top of the riser card, turn it 180 degrees to the left, hold the both ends of the cage and lift it straight up to remove it.



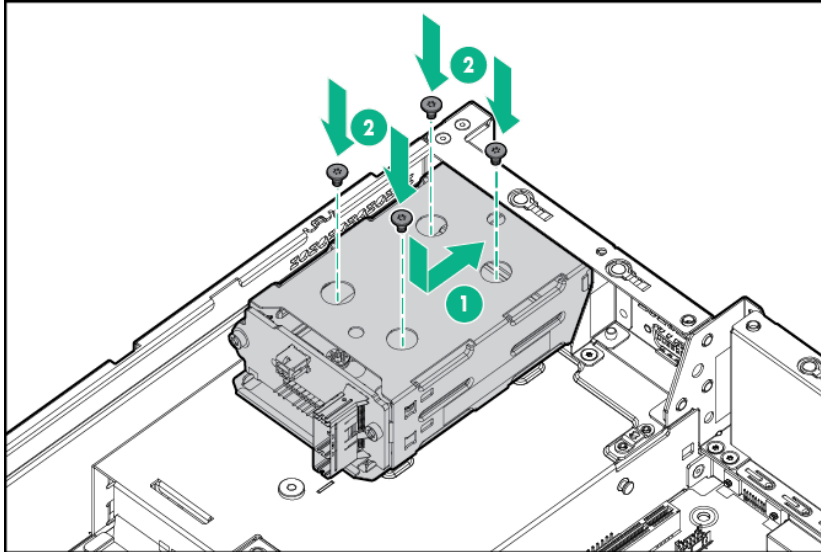
3. Unfasten the screws (x3) securing the tertiary blank cover, and pull the blank cover upward to remove it.



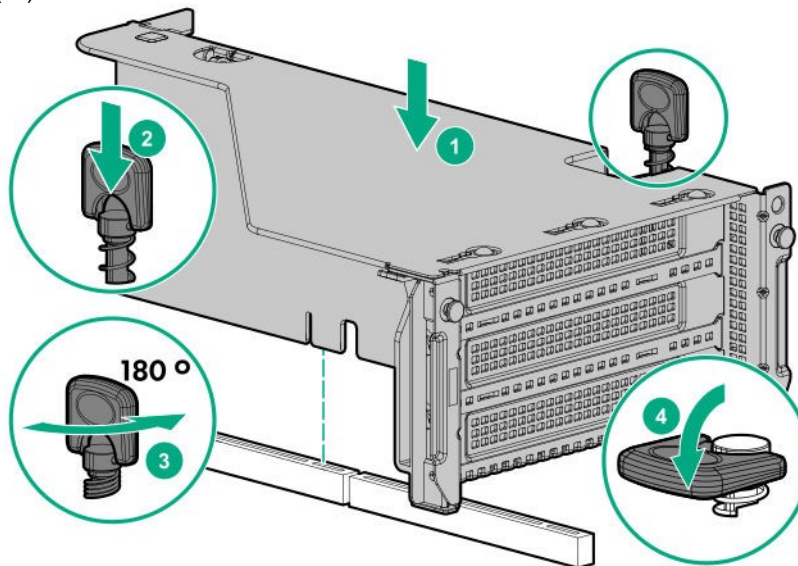
4. Insert the tertiary drive cage from the upward direction and secure it with the screws (x4).



5. Bring the 2x 2.5-inch drive cage out from the optional kit, attach rubber bushes on four slotted holes, install it through the inside to the outside of the housing, and secure with the screws (x4).

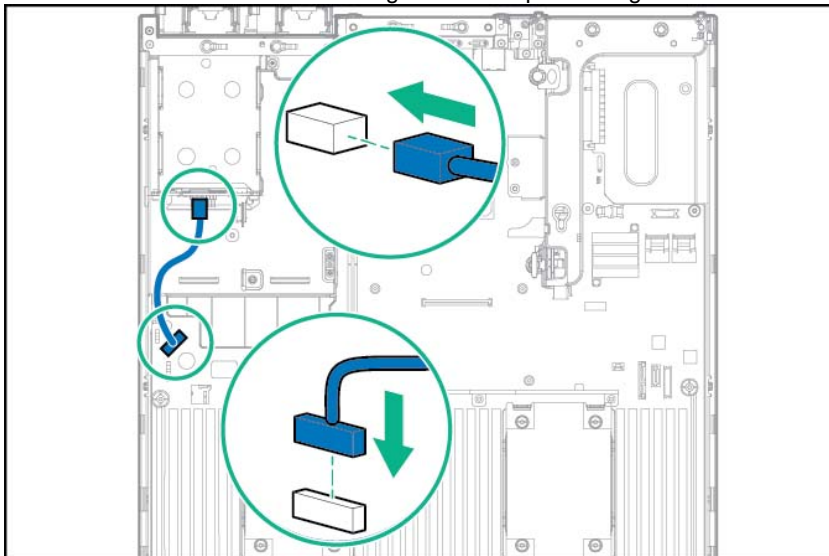


6. Attach a drive or a dummy tray to the drive cage.
7. If you removed a riser card in the step2, fit the terminal of riser card to the slot on the mother board and insert the terminal firmly into the slot. Then fix the riser card. Next, raise the screw handle at the top of cage and turn the handle to the right 180 degrees to fix the cage. Then put down the screw handle as before. If you removed a blank cover in step2, insert the cover from the upward direction and secure it with the screws (x2).

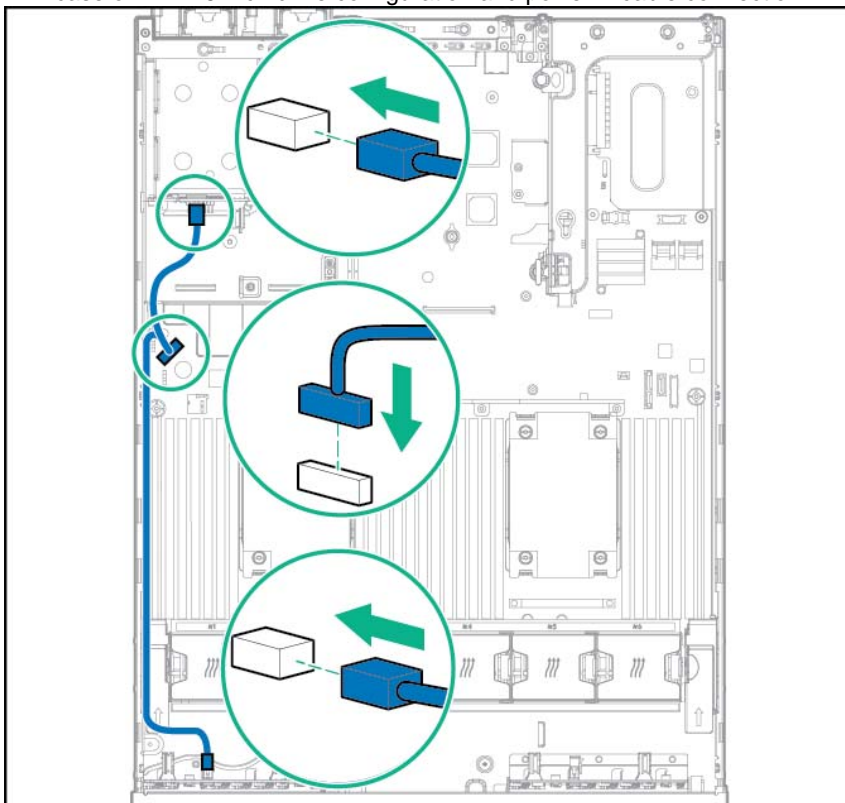


8. Connect the power cord between drive backplane and motherboard.

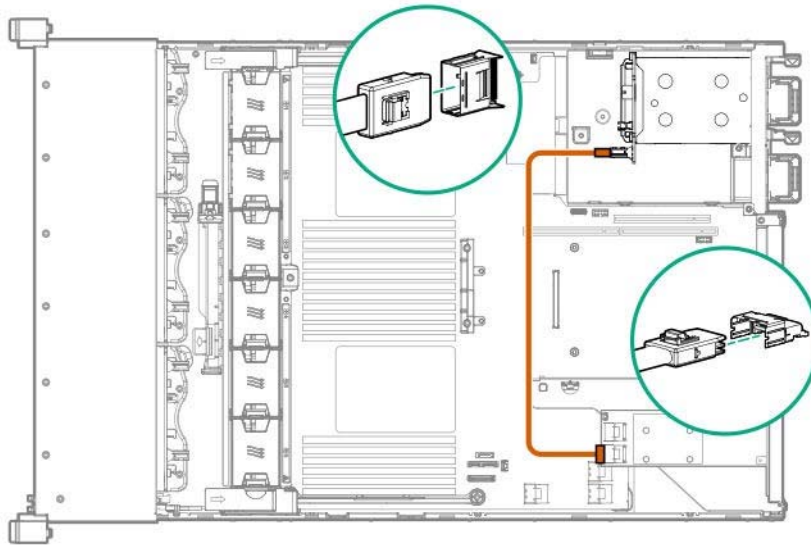
• In case of 12x 3.5-inch drive configuration and power single cable connection.



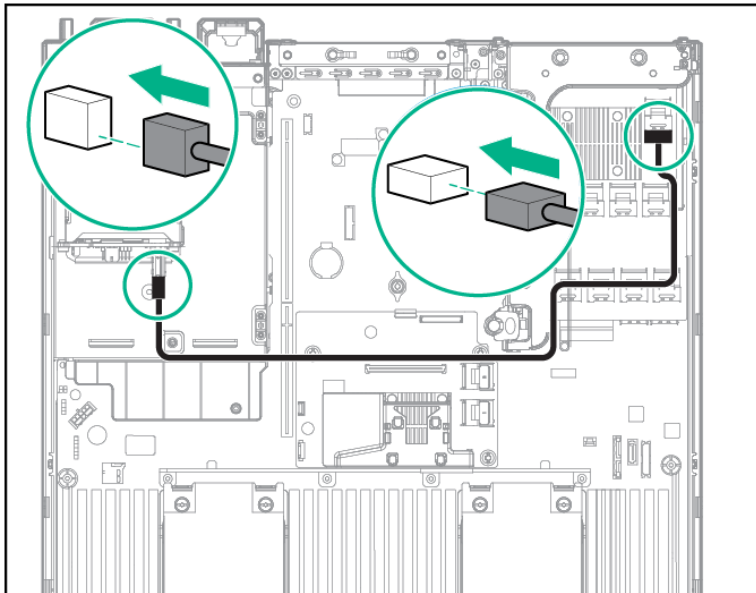
• In case of 24x 2.5-inch drive configuration and power Y cable connection.



9. Connect the data cable between drive backplane and controller.
  - Connecting to RAID Controller PCI Card



- Connecting to 12G SAS Expander Card with data cable



10. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

11. Please see *Chapter 2 (2 Installation and Connection)* in this manual to conduct installation and connection, and turn the power supply ON.

### 1.27.3 Removal

The procedure for removal is the reverse of installation.

Re-attach the blank cover if you operate without it attached.

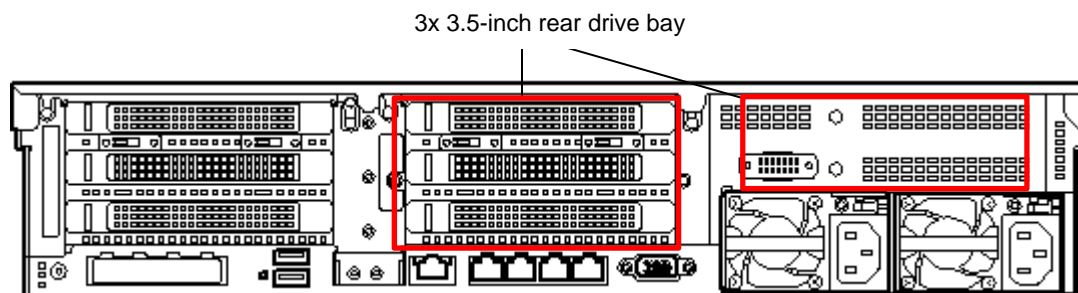
**Important**

Re-attach the blank cover removed to maintain the internal cooling.



## 1.28 3x 3.5-inch Rear Drive Cage N8154-99

The unit can be added with a 3x 3.5-inch drive cage on its rear side. When installing a rear drive cage, the 12x 3.5-inch drive must be fully installed in the front bay.



### 1.28.1 Installation

Please prepare the following before installing the options.

- Parts included in the option kit
- T-10 Hexalobular driver

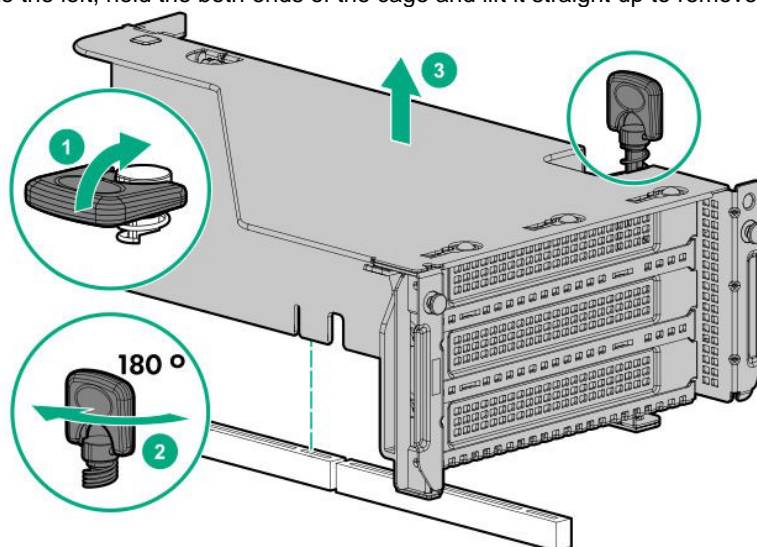
Before installing this option, the 12x 3.5-inch drive must be fully installed in the front bay. In addition, a high performance fan should be installed.

To install the components, follow these steps.

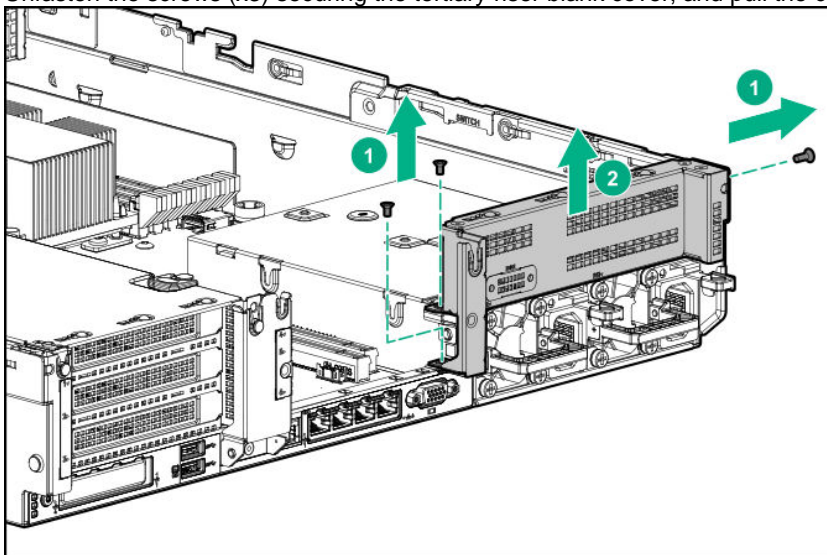
1. Back up all data in the server.
2. See steps 1 to 6 in Chapter 2 (1.2 Overview of Installation and Removal) for preparations.
3. If the secondary riser card is installed, remove it.

If this 3x 3.5-inch rear drive cage is installed, the secondary riser will not be supported.

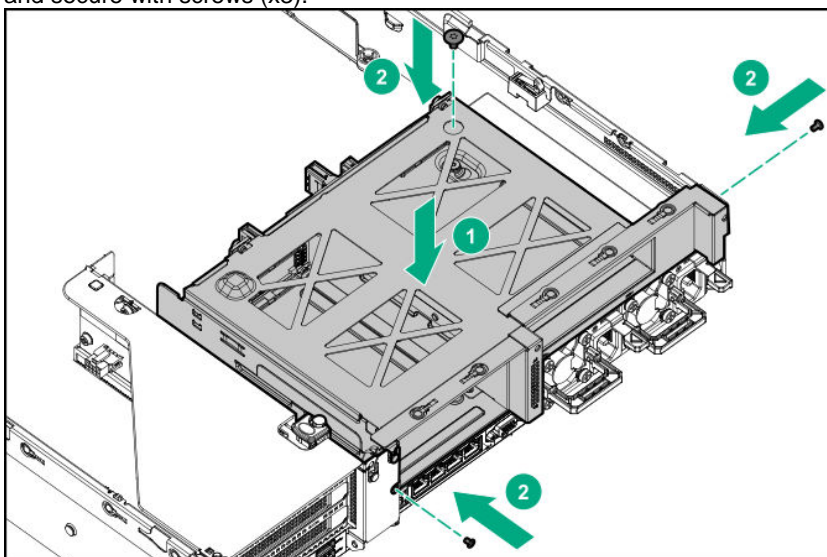
If the secondary riser card is mounted, raise the screw handle at the top of the riser card, turn it 180 degrees to the left, hold the both ends of the cage and lift it straight up to remove it.



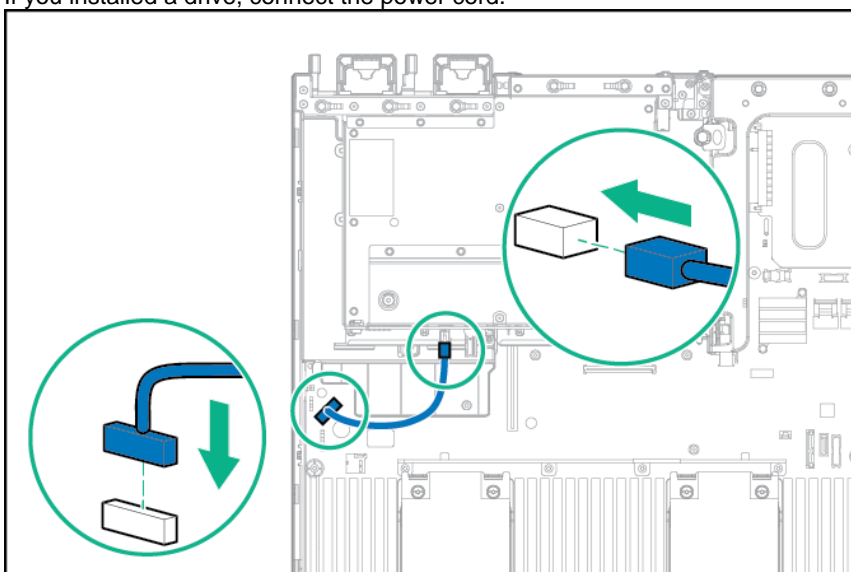
4. Unfasten the screws (x3) securing the tertiary riser blank cover, and pull the cover upward to remove it.



5. Attach a rubber bush on a slotted hole on the bottom of the 3 x 3.5 drive cage, install the cage from the top, and secure with screws (x3).

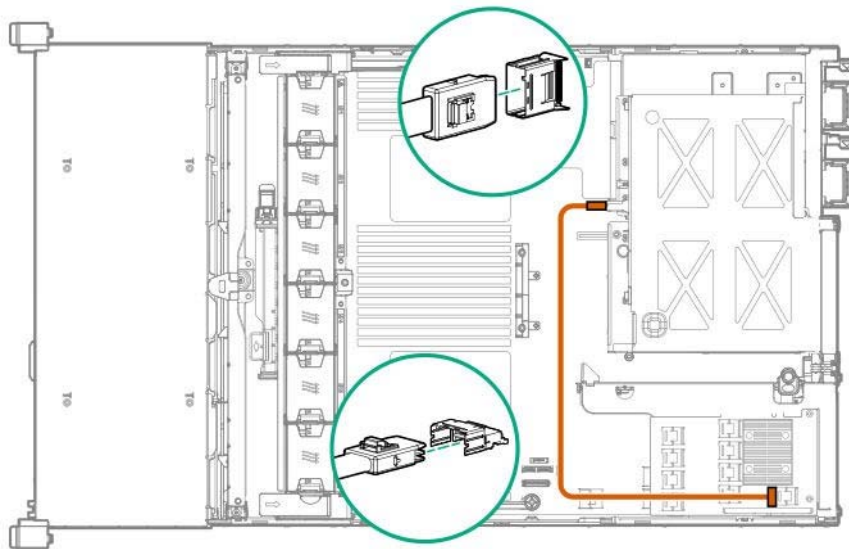


6. Install a 3.5-inch drive or a dummy tray.
7. If you installed a drive, connect the power cord.





8. Connect the data cable according to the following configuration.
  - Connecting to 12G SAS Expander



9. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

10. Please see *Chapter 2 (2 Installation and Connection)* in this manual to conduct installation and connection, and turn the power supply ON.

### 1.28.2 Removal

The procedure for removal is the reverse of installation.

Re-attach the blank cover if you operate without it attached.

**Important**

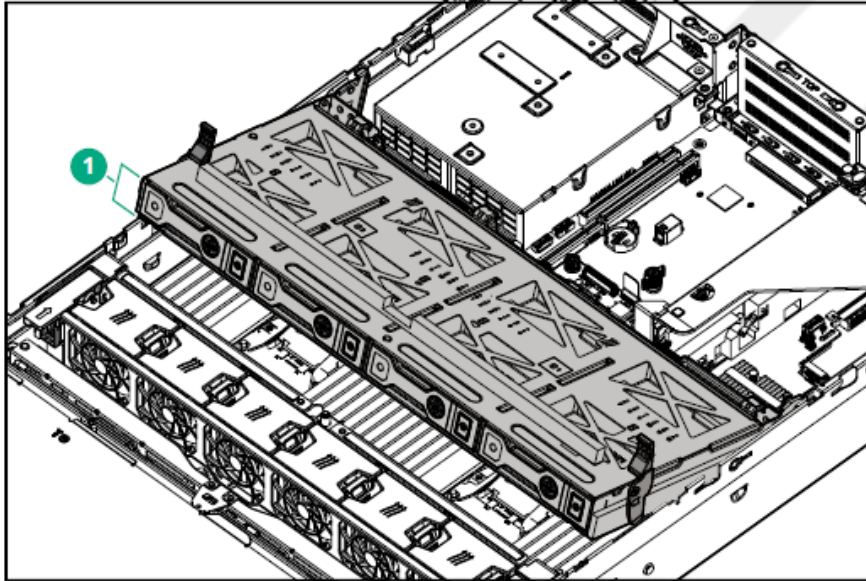
Re-attach the blank cover removed to maintain the internal cooling.

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## 1.29 4x 3.5-inch Mid-plane Drive Cage N8154-100

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The server can be added with a 4x 3.5-inch mid drive cage in its inside. When installing a mid drive cage, the 12x 3.5-inch drive must be fully installed in the front bay.



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### 1.29.1 Installation

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Please prepare the following before installing the options.

- Parts included in the option kit

The option must be attached under the following conditions.

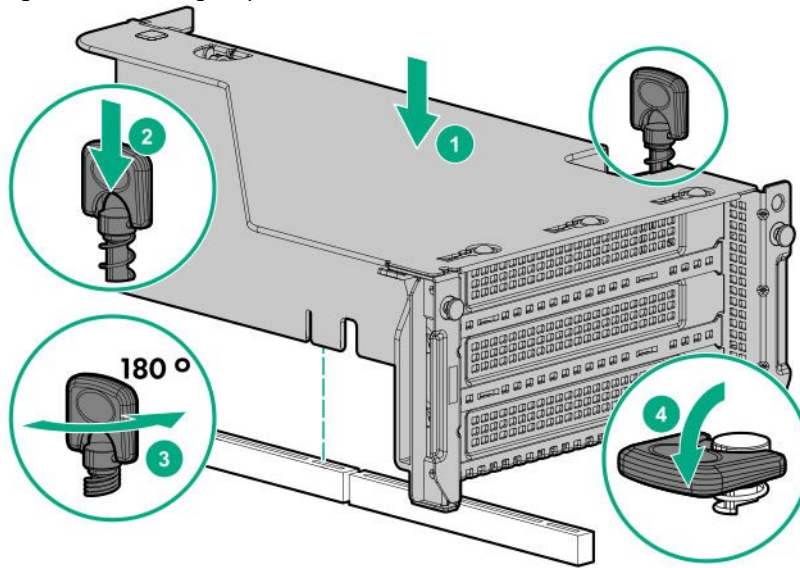
- A 1U heat sink is required to attach this option. Attach the 1U heat sink before attaching the mid-plane drive cage.
- If you would like to attach a TPM, attach the TPM before attaching the mid-plane drive cage.
- If you would like to attach a Type-a (mezzanine type AROC) RAID controller, attach the controller before attaching the mid-plane drive cage.

To install the components, follow these steps.

1. See steps 1 to 7 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.

2. Remove all the riser cards.

Raise the screw handle at the top of the riser card, turn it 180 degrees to the left, hold the both ends of the cage and lift it straight up to remove it.



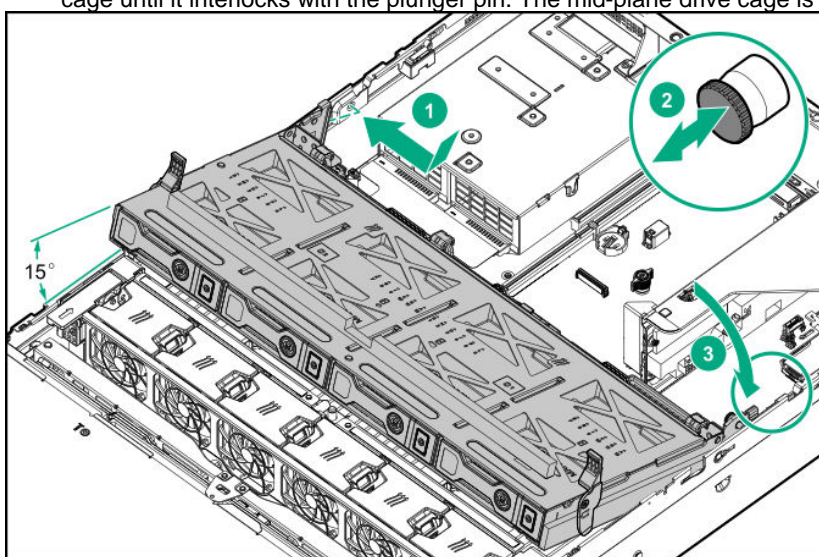
3. Connect the power cable for the mid-plane drive cage to the motherboard.
4. Lift up the latch of the drive cage.
5. Install the drive cage.

**Note**

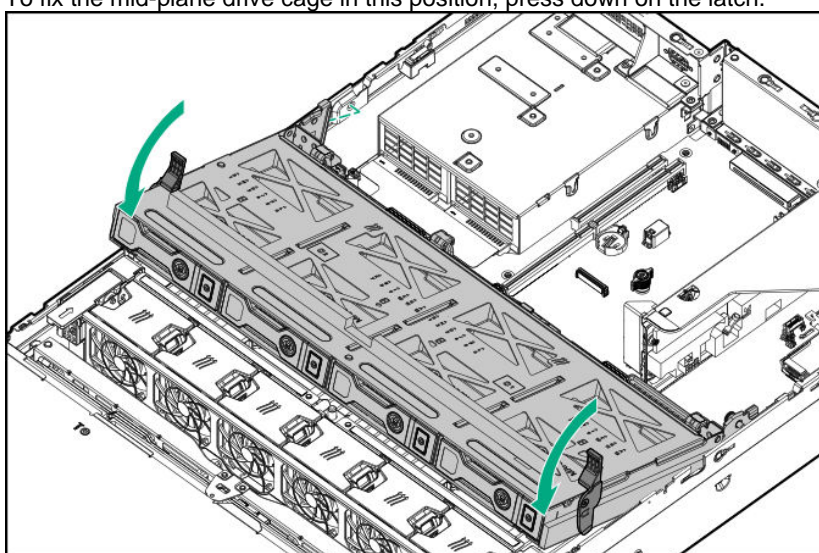
Do not drop the drive cage onto the motherboard. Dropping the drive cage onto the motherboard may damage the motherboard or other components. Remove all drives and attach the drive cage to the device using both hands.

- (1) Attach the back side of the mid-plane drive cage to the standard positioning pins.
- (2) Position the remaining pins on the back of the mid-plane drive cage with the device, and insert the pins.
- (3) Slowly lower the opposite side of the mid-plane drive cage.

- (4) Pull the plunger pin on the back right of the mid-plane drive cage and slowly lower the mid-plane drive cage until it interlocks with the plunger pin. The mid-plane drive cage is attached in this manner.



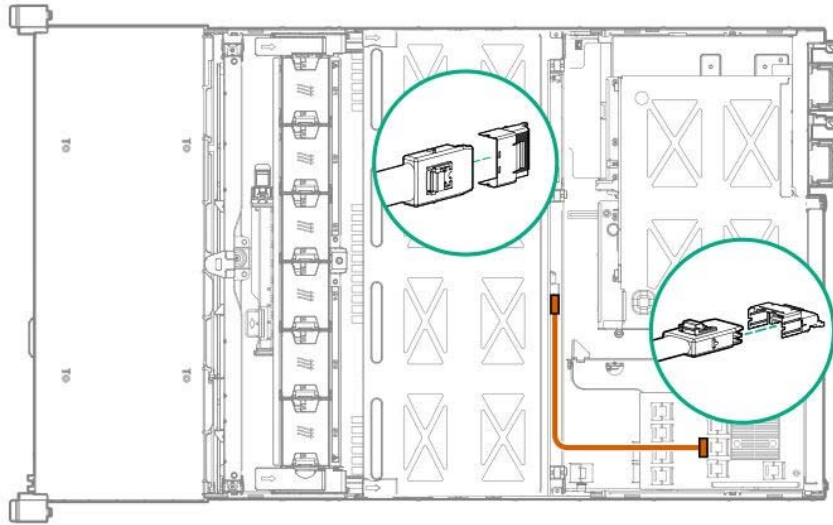
6. Mount the drive.
7. To fix the mid-plane drive cage in this position, press down on the latch.



8. Install all the riser cards.

9. Connect the power cable to the backplane of the mid-plane drive cage.

When connecting the data cable from the backplane of the mid-plane drive cage to the SAS expander, connect to Port 6.



10. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

11. Please see *Chapter 2 (2 Installation and Connection)* in this manual to conduct installation and connection, and turn the power supply ON.

### 1.29.2 Removal

The procedure for removal is the reverse of installation.

Re-attach the blank cover if you operate without it attached.

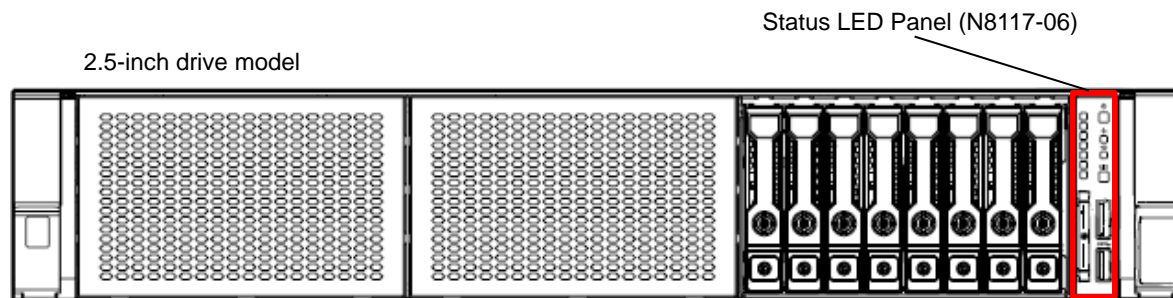
**Important**

Re-attach the blank cover removed to maintain the internal cooling.



## 1.30 Status LED Panel (System Insight Display) kit N8117-06

The LED display panel allows easy monitoring of the operating status of the entire system (Status LED Panel). Using this panel allows for diagnosing.



**Important** The surface becomes hot after use so to avoid burns please allow the drive and internal parts of the system to cool before touching.

**Note** In order to prevent the damage to electronic components, please start to install the system after conducting the appropriate anti-static treatment. There is a possibility of causing electrostatic discharge if appropriate grounding wire treatment is not conducted.

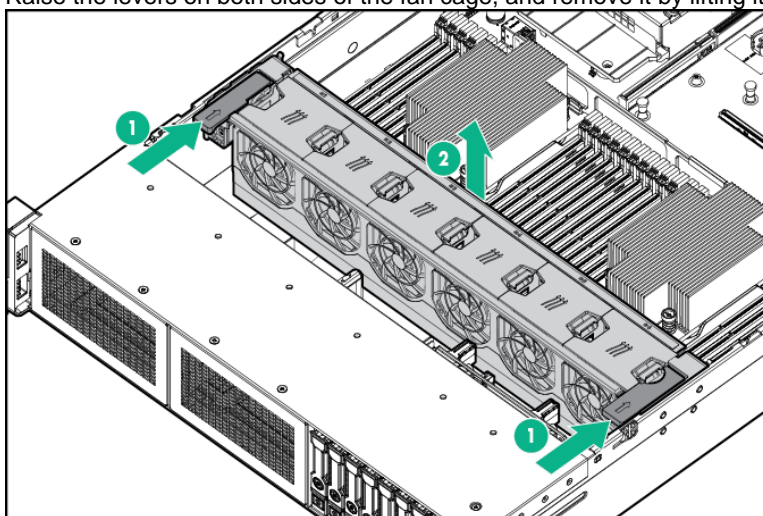
### 1.30.1 Installing Status LED Panel kit

Please prepare the following before installing the options.

- Parts included in the option kit
- T-10 hexalobular driver

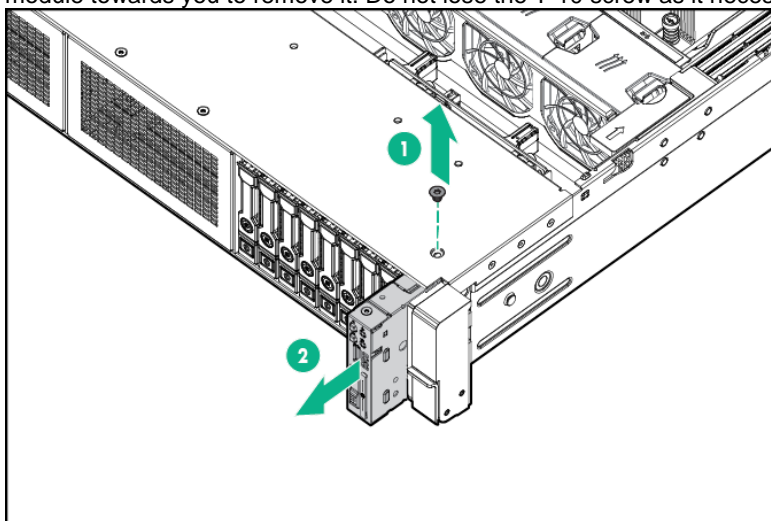
To install the components, follow these steps.

1. See steps 1 to 7 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Raise the levers on both sides of the fan cage, and remove it by lifting it upwards.

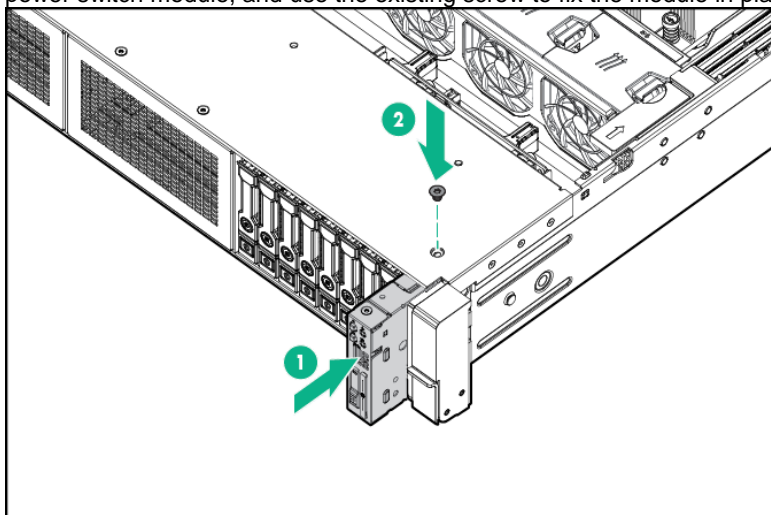


**Note** Pay attention not to pinch the cables or fold them when connecting cables.

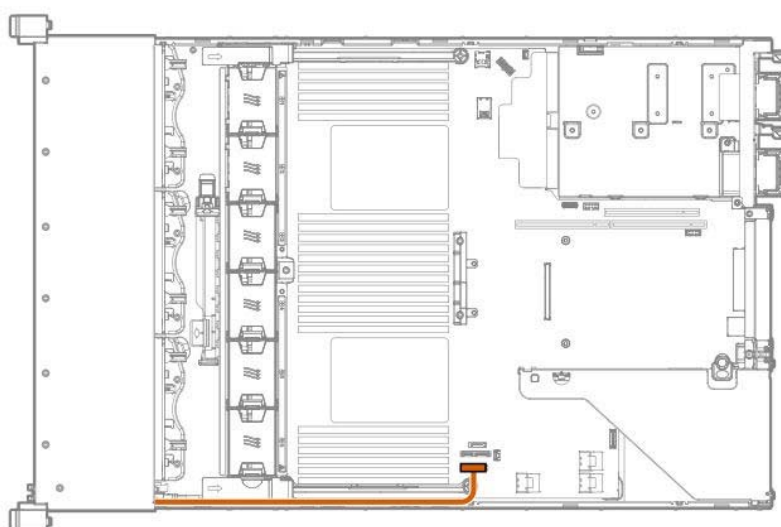
3. Remove the (1) screw that secures the power switch module that is connected to the cable, and pull the module towards you to remove it. Do not lose the T-10 screw as it necessary for attachment.



4. Route the cables through the openings on the front side of the server, attach the Status LED Panel module power switch module, and use the existing screw to fix the module in place.



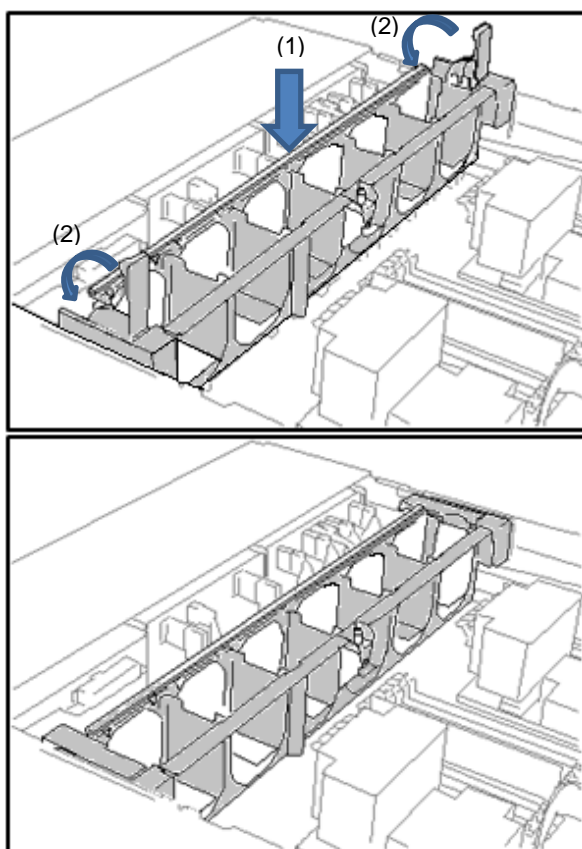
5. Connect the Status LED Panel module cable to the motherboard.



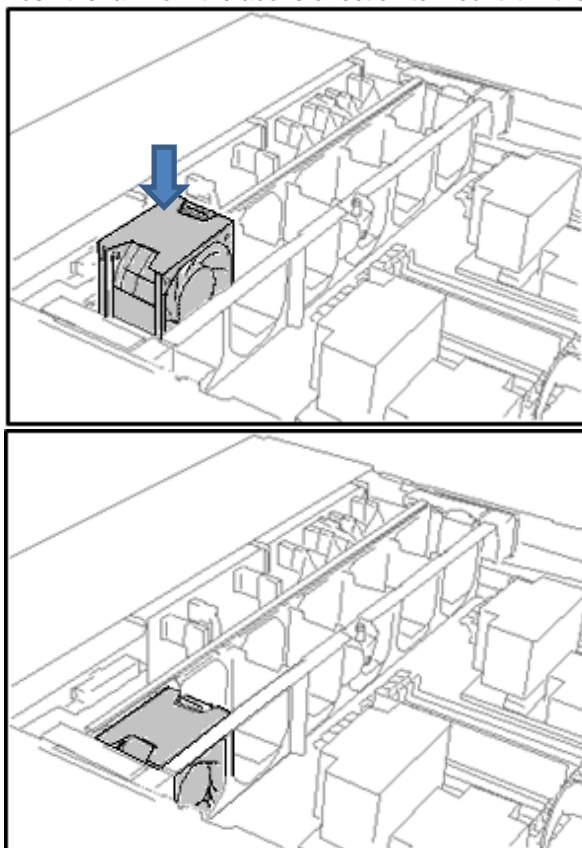


6. Remove all the fans from the fan cage to the state where only the fan cage is left.

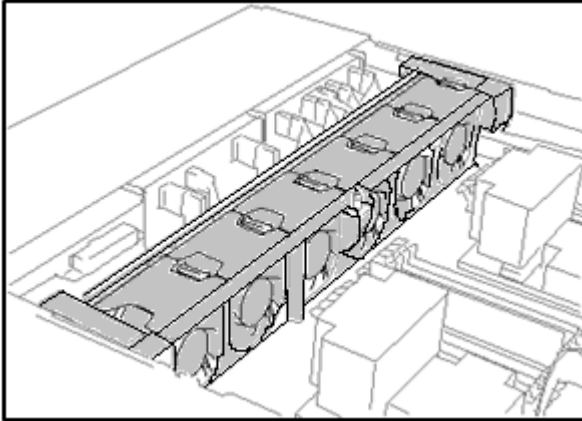
Next, align the fan cage with the device, push the cage slowly from the above direction, and tilt both sides of the levers to secure it.



7. Push the fan from the above direction to mount it in the fan cage.



8. Reinstall all the fans that have been removed earlier.



9. See *Chapter 2 (1.34 Attaching the Air Baffle)* to attach the air baffle.
10. See *Chapter 2 (1.34 Installing Top Cover)* to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

11. Please see *Chapter 2 (2 Installation and Connection)* in this manual to conduct installation and connection, and turn the power supply ON.

### **1.30.2 Removal**

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The procedure for removal is the reverse of installation.

Re-attach the blank cover if you operate without it attached.

**Important**

Re-attach the blank cover removed to maintain the internal cooling.

---

## 1.31 Serial cable N8117-09

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A serial connector can be attached to this device.

If a tertiary riser card is attached, a serial connector can be attached by using Slot 6.

**Note**

In order to prevent the damage to electronic components, please start to install the system after conducting the appropriate anti-static treatment. There is a possibility of causing electrostatic discharge if appropriate grounding wire treatment is not conducted.

---

### 1.31.1 Installation

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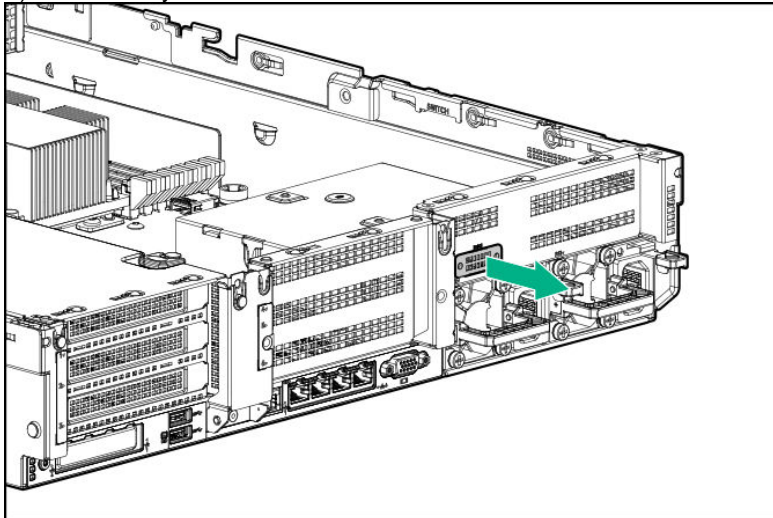
Please prepare the following before installing the options.

- Parts included in the option kit
- T-10 hexalobular driver

To install the components, follow these steps.

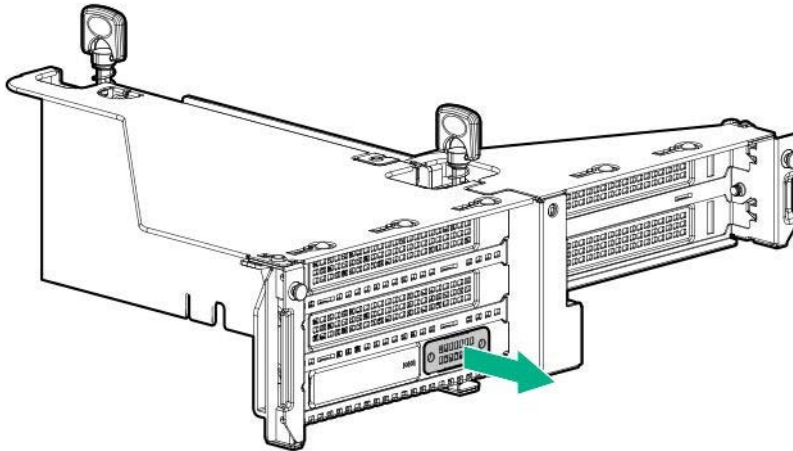
1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Pull the serial cable blank cover forward to remove it.

A) If a tertiary riser is not attached



## B) If a tertiary riser is attached

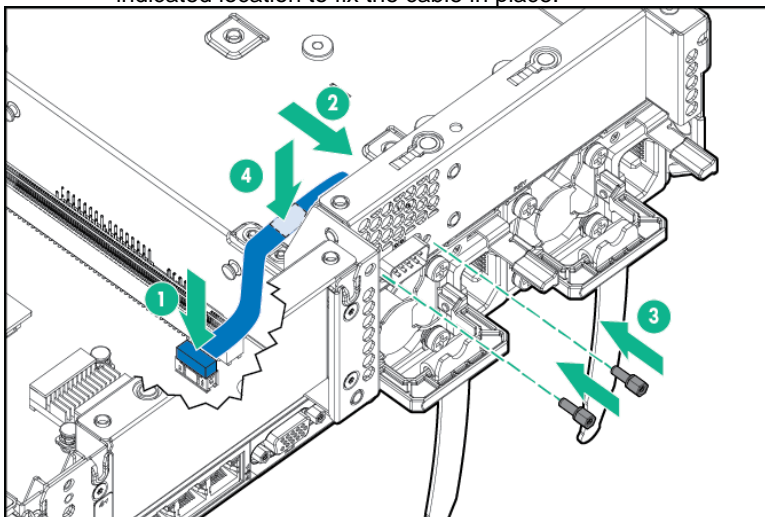
Remove the serial blank cover as shown below.



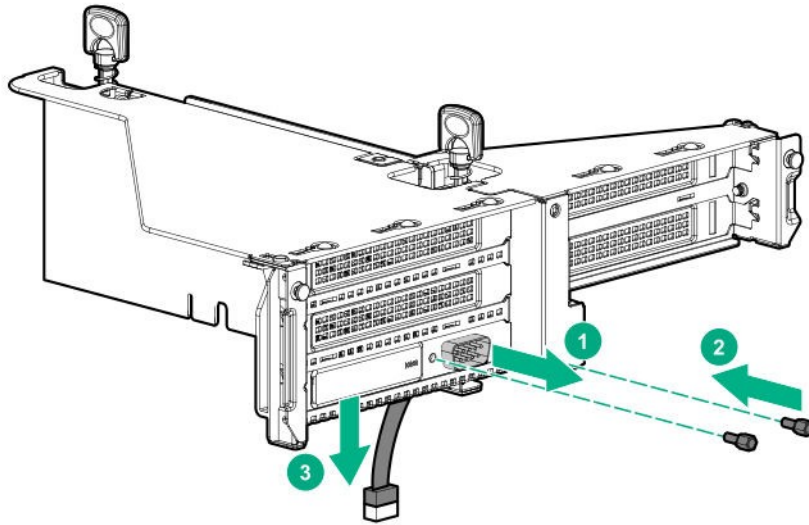
## 3. Install the serial cable.

## A) If a tertiary riser is not attached

- (1) Position the serial cable as shown below.
- (2) Attach the serial cable connector.
- (3) Secure the external connector with screws (x2).
- (4) Remove the paper backing of the double-sided tape, and press it against the cable at the indicated location to fix the cable in place.



- B) If a tertiary riser is attached
- (1) Attach the external serial connector parts.
  - (2) Fix it with the screws (x2).
  - (3) Connect the serial cable connector.



4. See Chapter 2 (1.34 *Installing Top Cover*) to attach the top cover of the server.

**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

5. Please see *Chapter 2 (2 Installation and Connection)* in this manual to conduct installation and connection, and turn the power supply ON.

### 1.31.2 Removal

The procedure for removal is the reverse of installation.

Re-attach the blank cover if you operate without it attached.

**Important**

Re-attach the blank cover removed to maintain the internal cooling.

## 1.32 Use of Internal Hard Disk Drives in the RAID System

This section describes how to use the internal hard disk drives in the RAID System.

- Important** If you use hard disk drives in the RAID System or change the RAID level, hard disk drives are initialized. If the hard disk drive contains valuable data, be sure to backup the hard disk drive before installing the RAID Controller and configuring the RAID System.
- Note** Build a Disk Array in the RAID System using hard disk drives that have the same specifications (capacity, rotational speed, and standard).
- Tips**
- Logical Drives can be created even with only one Physical Device.
  - When using SAS hard disk drive, SAS SSD, or SATA SSD, it must be connected to RAID Controller.

### 1.32.1 Notes on Building RAID System

Note the following points when building a RAID System.

- The number of hard disk drives required varies in each RAID level.
- If the optional RAID Controller (N8103-189/195) is used, the RAID System cannot be built in RAID5/RAID6/RAID50/RAID60.

RAID level	The minimum number of hard disk drives required to set up a RAID System	
	N8103-189/195	N8103-190/191/201
RAID 0	1	1
RAID 1	2	2
RAID 5		3
RAID 6		3
RAID 10	4	4
RAID 50		6
RAID 60		6

- In the RAID System, all the hard disk drives in a group (pack) must have the same capacity, interface type, and rotational speed.
- If you intend to install the OS to the RAID System, the process from RAID configuration to OS installation can be easily completed by using EXPRESSBUILDER.
- If you wish to install the OS manually, use RAID System Off-line Utility (Ctrl-R or HII). For details, see *Chapter 2 (2. RAID System Configuration)* in "Maintenance Guide" or the manual supplied with the optional RAID Controller (N8103-189/190/191/195/201)

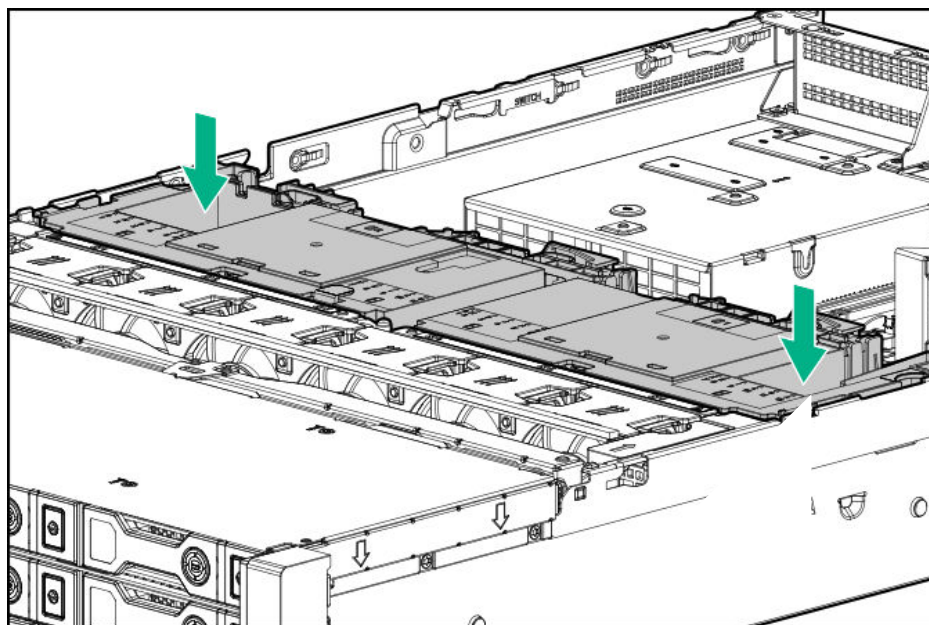
- Important** Build a Disk Array in the RAID System using hard disk drives that have the same specifications (capacity, rotational speed, and standard).

---

## 1.33 Attaching the air baffle

---

The procedure for removal is the reverse of installation.

**Important**

Keep the air baffle close to the device when attaching it so the cables are not pulled.  
Attaching the air baffle without keeping it close to the device may result in damage.

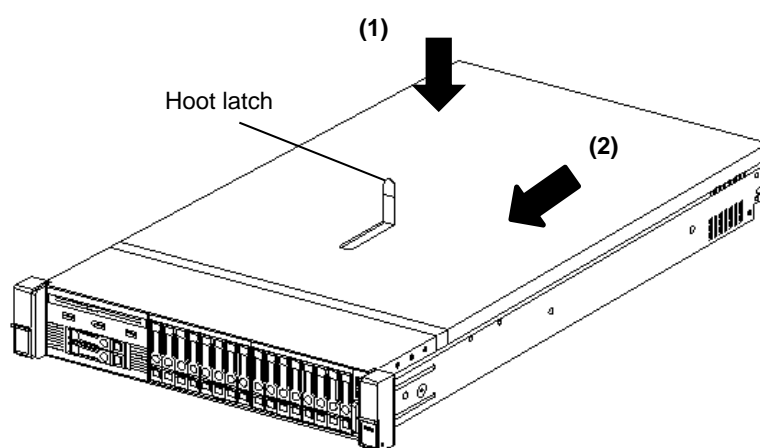


## 1.34 Installing Top Cover

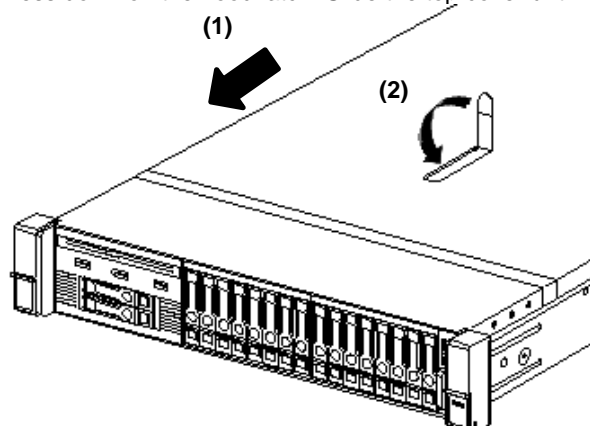
When all internal optional devices are installed, close the server with Top Cover.

Please have ready a hexalobular driver (t-10) or flathead driver.

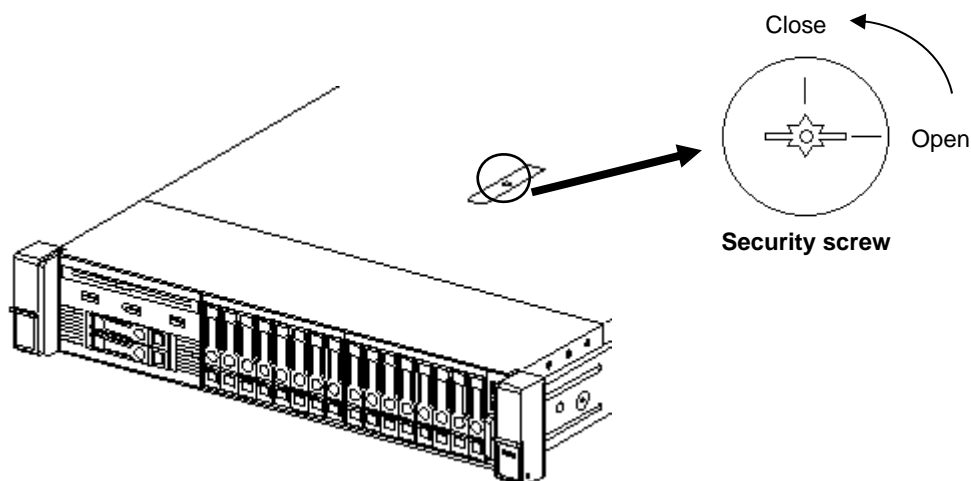
1. Leave the hood latch open and place the top cover straight on the unit so that it is securely inserted in the frame. Adjust the position of the top cover so that it protrudes approximately 1.25 cm (0.5 inch) from the rear of the unit.



2. Press down on the hood latch. Slide the top cover until it is completely closed.



3. Tighten the security screw on the hood latch with hexalobular screwdriver (T-10) or flathead driver.



## 1.35 Drives

The expansion bay for connecting drives is located on the front and back. Drives can be purchased mounted on a dedicated tray. The device should be installed as mounted on the tray.

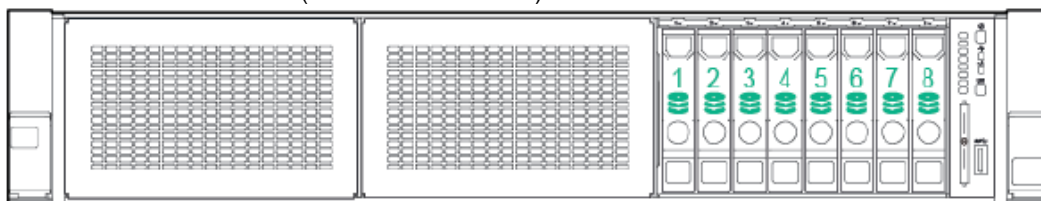
**Important** Use hard disk drives specified by NEC. Installing a third-party hard disk drive might cause a failure of the server as well as the hard disk drive.

Note the following when attaching.

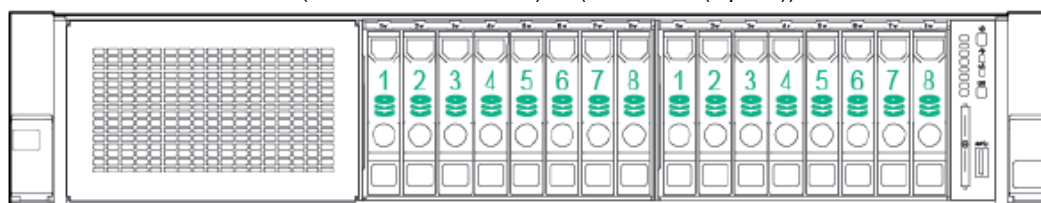
- For on-board connections, hard disk drives of different types and/or rotational frequencies cannot be used together.
- When performing RAID constructions, use hard disk drives of the same capacity, type, and rotational frequency within the same group (pack).
- If you are using only one hard disk drive, please install it in the bay with the smallest lowest device number.
- When drives that are grouped together into the same drive array, for the most efficient use of storage space, set each drive at the same capacity.

Unique device numbers have been assigned to each slot.

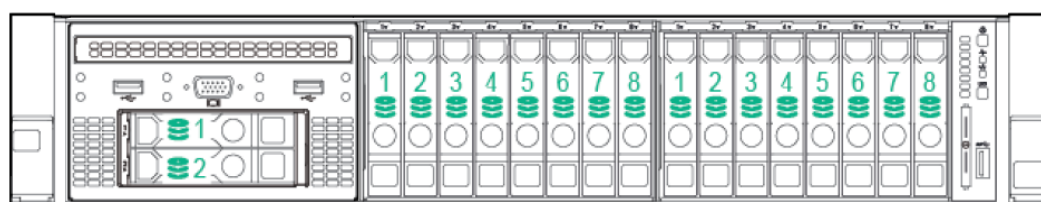
8x 2.5-inch drive model (SAS/SATA HDD/SSD)



8x 2.5-inch drive model (SAS/SATA HDD/SSD) or (PCIe SSD (Option))



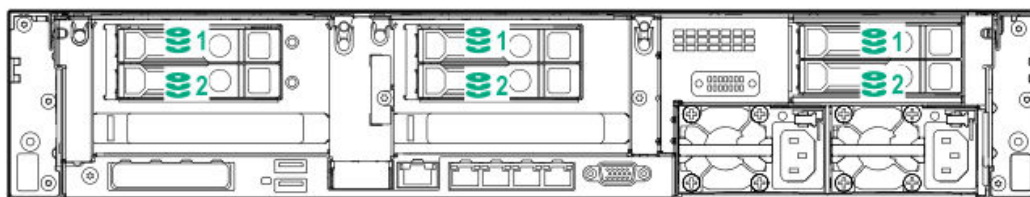
8x 2.5-inch drive model (SAS/SATA HDD/SSD, PCIe SSD) + 2x2.5 (SAS/SATA HDD/SSD, PCIe SSD)



8x 2.5-inch drive model (SAS/SATA HDD/SSD, PCIe SSD)



2.5/3.5-inch drive model rear (SAS/SATA HDD/SSD)



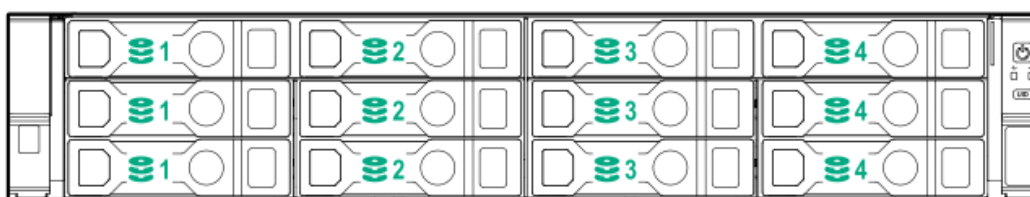
8x 3.5-inch drive model (SAS/SATA HDD)



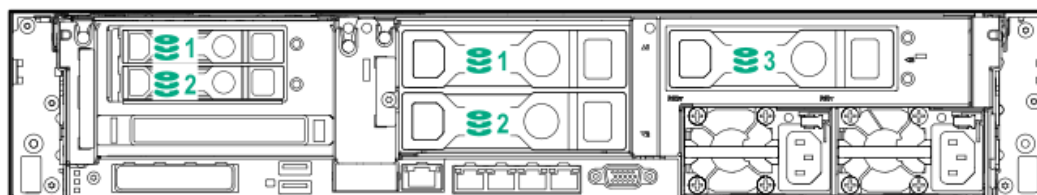
8x 3.5-inch drive model (SAS/SATA HDD)+ 2x2.5 (SAS/SATA HDD/SSD, PCIeSSD)



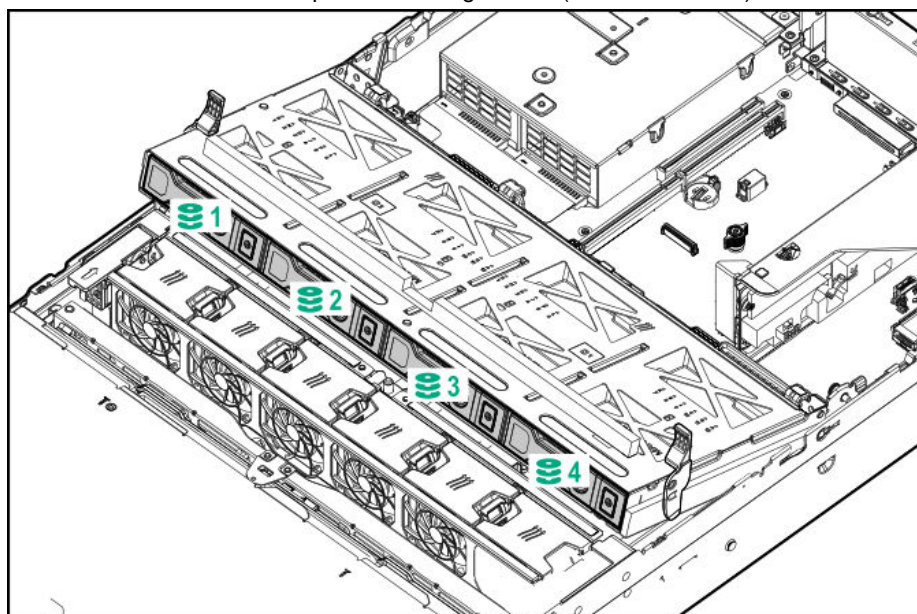
12x 3.5-inch drive model (SAS/SATA HDD)+ 4x 3.5 (SAS/SATA HDD)



3.5-inch drive model rear 2x2.5 (SAS/SATA HDD/SSD)+ 3x3.5 (SAS/SATA HDD)

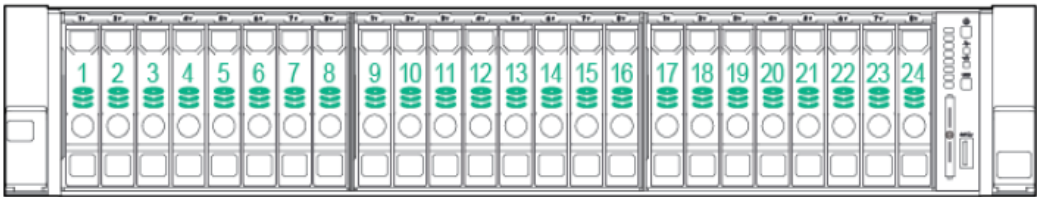


3.5-inch drive model mid-plane drive cage 4x3.5 (SAS/SATA HDD)

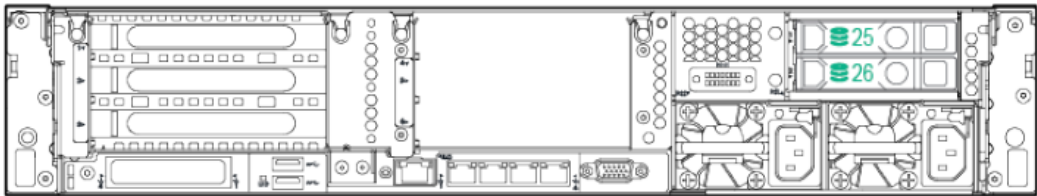


**SAS Expander connection**

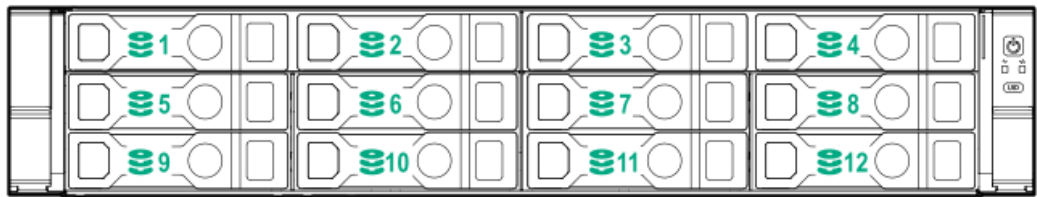
Slot numbers will change with the cable connections. The following are the examples of that.  
24x2.5-inch drive model (SAS/SATA HDD/SSD)



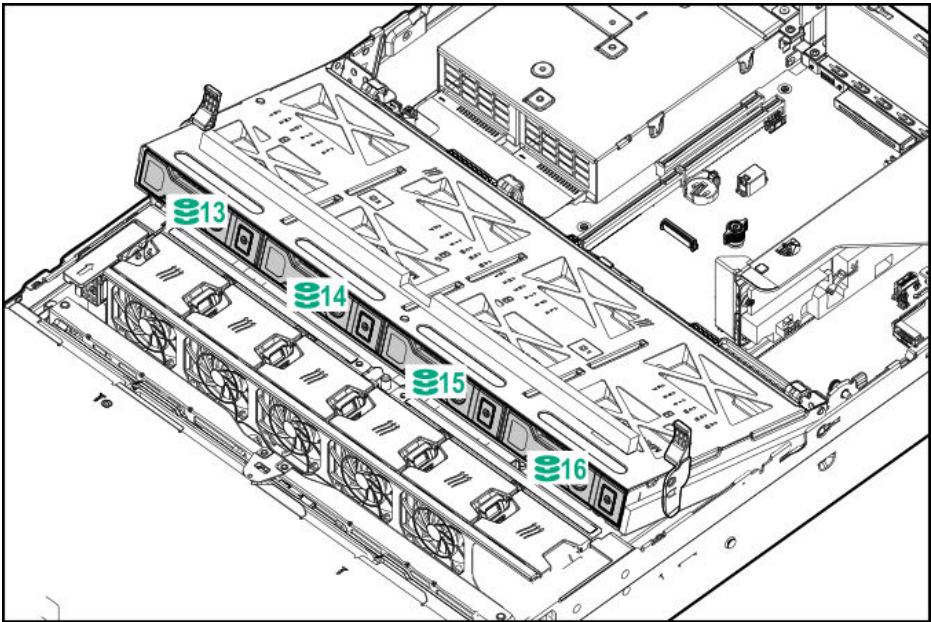
24x2.5-inch drive model rear 2x2.5 (SAS/SATA HDD/SSD)



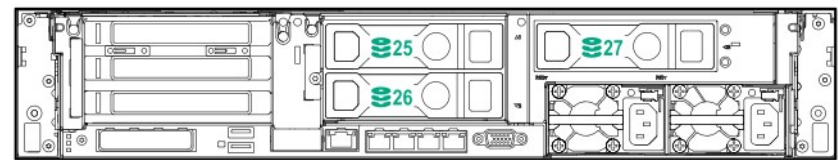
12x 3.5-inch drive model (SAS/SATA HDD)



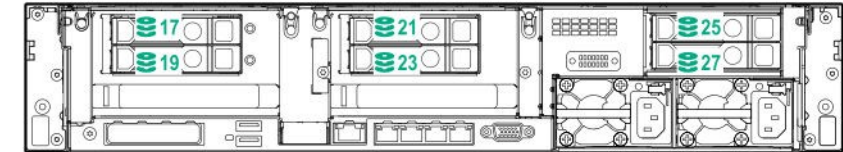
12 x 3.5-inch drive model Mid-plane Drive (SAS/SATA HDD)



12x 3.5-inch drive model rear (SAS/SATA HDD)



12x3.5-inch drive model rear (SAS/SATA HDD/SSD)





### 1.35.1 Installing a SAS or SATA drive

Install a hard disk drive by using the following procedure.

**Note**

In the RAID System, use hard disk drives that have the same specifications (capacity, rotational speed, and standard) for each Disk Array.

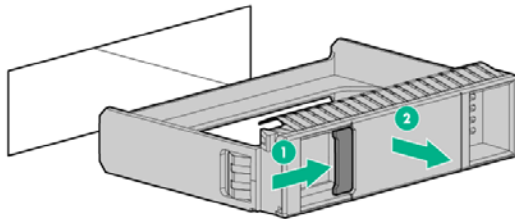
1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.

Locate the slot where you install the hard disk drive.

Install hard disk drives in ascending order of port number.

2. Remove the dummy tray.

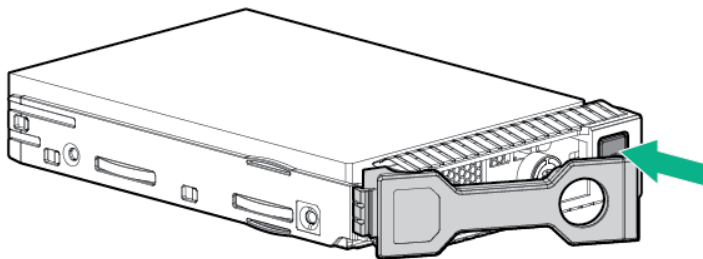
Dummy trays are installed in every slot.

**Note**

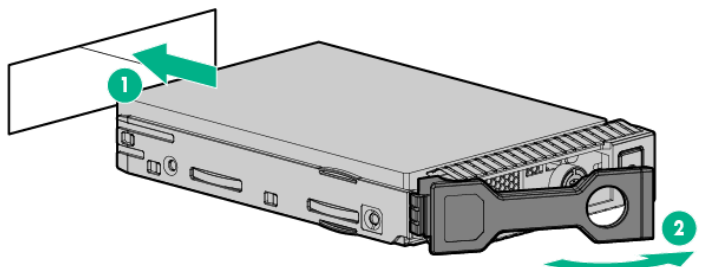
Keep the removed dummy trays for future use.

3. Prepare the drive.

Unlock the handle of the tray.



4. Hold the tray firmly and insert it into the slot.

**Note**

- Push it all the way until the handle's lock touches the frame.
- Hold the tray firmly with both hands.

5. Slowly close the handle.  
The tray is locked making a clicking sound.

**Note**

When you push the drive into the slot, confirm the handle got hooked on the frame.

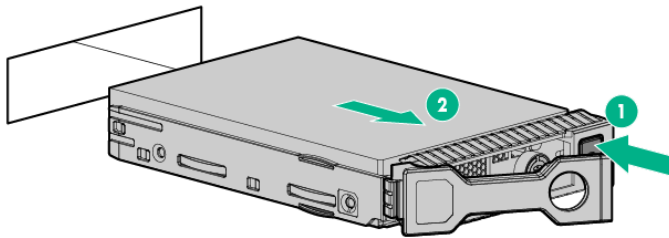
6. Check the drive status via definition of the drive LED.

### 1.35.2 Removing Hot Plug Compatible SATA Hard Disk Drive

**Note**

To ensure adequate cooling effect, top cover, baffle, expansion slot cover, and blank should be installed for server operation. If the server supports the hot-pluggable components, please minimize the opening time of the top cover.

1. Check the drive status via definition of the drive LED.
2. Back up all server data in the drive.
3. Unlock the handle of the tray.  
Grasp the handle and slowly pull it to remove the drive.



If you transfer or dispose of the removed hard disk drive, see *Chapter 1 (1. Relocation and Storage)* in *Maintenance Guide* to erase data.

**Important**

NEC assumes no liability for data leakage should the product be transferred to a third party without erasing the data.

**Note**

The saved boot order is cleared when a hard disk drive is added.

### 1.35.3 Installing PCIe SSD Drive

PCIe SSD drives are supported, when the front 2.5-inch drive cage or 2 x2.5-inch drive cage is installed. For supported PCIe SSD drives, see "Chapter 1 4.10 Device Number".

To install the drives, follow these steps.

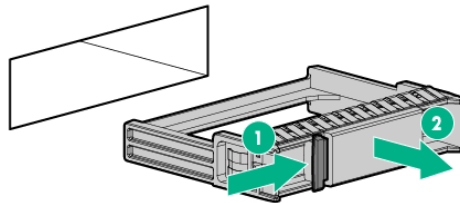
**Important**

For Windows Server 2012 R2 and Windows Server 2016, a patch is needed which is named "NVMe Drive Eject NMI Fix for Intel Xeon Processor Scalable Family for Windows.exe". It can be found in your EXPRESSBUILDER DVD media.

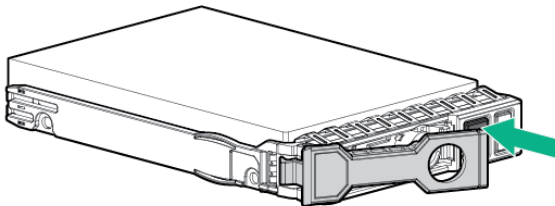
**Note**

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

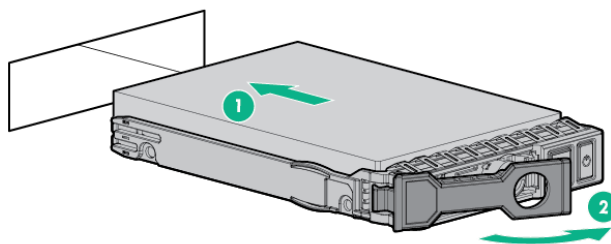
1. Remove the drive blank if it is installed.



2. Prepare the drive.  
Press the removal prohibit switch to open the release handle.



3. Hold the tray firmly and insert it into the slot.



**Note**

- Push it all the way until the handle's lock touches the frame.
- Hold the tray firmly with both hands.

4. Confirm that Remove Protect Switch/LED has lighted on.
5. Slowly close the handle.  
The tray is locked making a clicking sound.

**Note**

When you push the drive into the slot, confirm the handle got hooked on the frame.

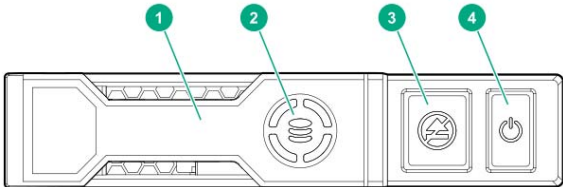


1.35.4 Removing the PCIe SSD Drive

To remove the PCIe SSD drive, follow the procedure below. In addition, when discarding or transferring the removed PCIe SSD drive, make sure to erase the data at your own risk in accordance with *Chapter 1 (1. Transfer and storage)* of the "Maintenance Guide."

Important

NEC assumes no liability for data leakage should the product be transferred to a third party without erasing the data.



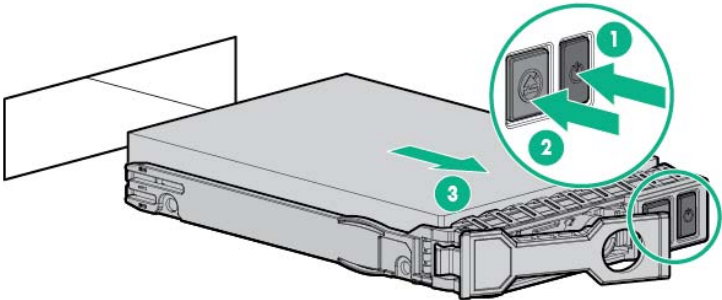
No.	Item
1	release lever
2	Activity ring LED
3	Do not remove switch / LED
4	Power switch

1. Press the power switch.
- The LED of the removal prohibit switch lights up and flashes.

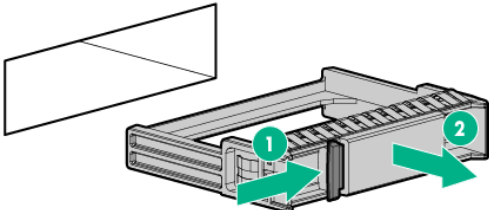
Note

Do not remove the PCIe SSD from the drive bay if the LED of the removal prohibit switch is flashing. The flashing LED of the removal prohibit switch indicates that the device is still in use. Removing the PCIe SSD before completion of the device signal and traffic flow may result in data loss.

2. Wait until the flashing stops and the Do Not Remove switch is no longer illuminated.
- Press the removal prohibit switch and open the release lever.



3. Remove the drive.
4. Install the 2.5-inch drive blank in the drive bay unused.



## 1.36 Power Supply Unit

A redundant configuration can be set with two hot-swappable power supply units (The standard version has one unit).

The server provides a redundant power configuration that ensures continued operation of the system in the unlikely event one of the power supply units fails.

### Note

AC power supply unit has a cable tie to prevent AC cable from slipping out.

### 1.36.1 Installation

### Note

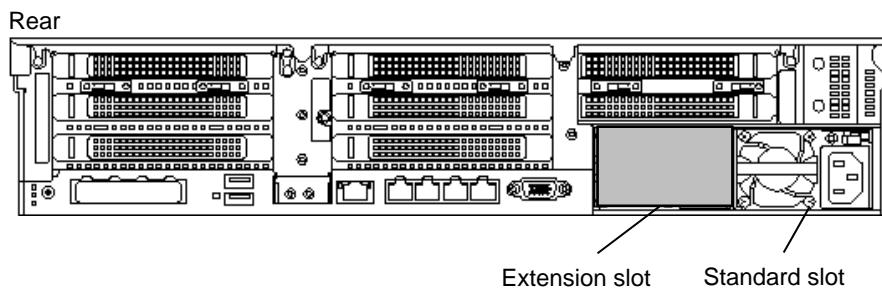
The both two power supply units installed in the server must have the same capacity. Make sure that the two power supply units have the same part number and the same label color. If the two power supply units are inappropriate, the system may become unstable to be shut down.

### Note

In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

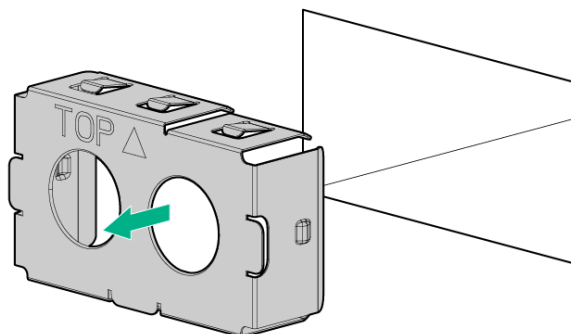
Follow the steps below to install the power supply unit.

1. See steps 1 to 4 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Remove the blank cover.



### Important

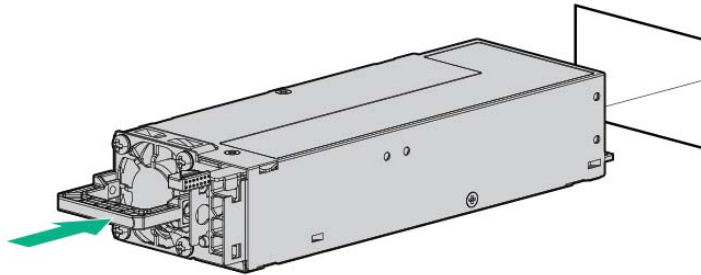
The surface becomes hot after use so to avoid burns please allow the drive and internal parts of the system to cool before touching.



**Note**

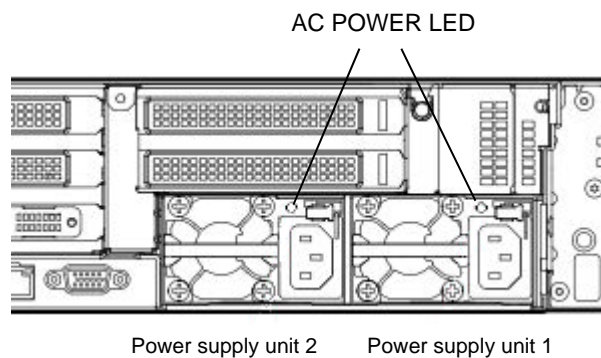
Keep the removed blank cover for future use.

3. Insert the power supply unit into the power supply bay until it is locked with clicking sound.



4. Connect power cords.  
Use the specified power cords.

When the power cord is connected, the AC power LED on the power unit will turn green.




5. Power on the server.
6. Confirm, by STATUS LED or on POST screen, that there are no errors related to the power supply units.  
See *Chapter 3 (1. IML Error Message)* in *Maintenance Guide* for details on POST error messages.  
If AC POWER LEDs are off, reinstall the power supply units. If the same error occurs, contact with your sales representative.

### 1.36.2 Replacing a failing power supply unit

Replace only when the power supply unit fails.

**⚠ CAUTION**



Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to **Safety Precautions and Regulatory Notices**.

- Pay attention to electric hazard.

**Important**

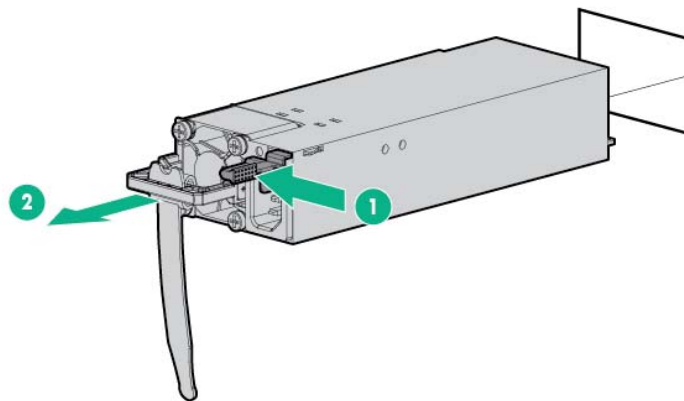
- Do not remove a power supply unit operating normally.
- The blank cover installation is essential for maintaining the cooling effect.

1. Check the power supply unit where the LED (AC power LED) is off.
2. Power off the server.

**Tips**

In the redundant power configuration (with two power supply units) and if either one of power supply units fails, the failing power supply unit can be replaced with the system power on.

3. Disconnect the AC power cord from the failing power supply unit.
4. Push the lever of the failing power supply unit toward inside, and pull the power supply unit while holding the handle.



5. If operating the server with a single power supply unit without installing a new one, install the blank cover you removed in step 2 of installation procedure.

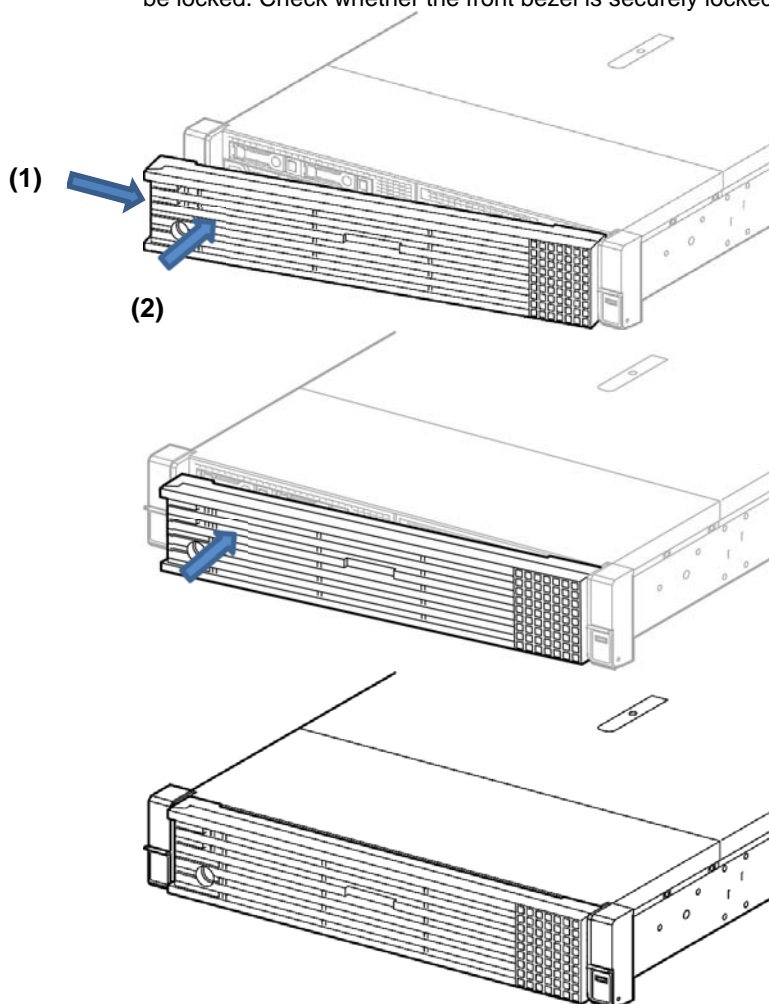
**Important**

To maintain the cooling effect in the server, be sure to install the blank cover in the vacant slot.

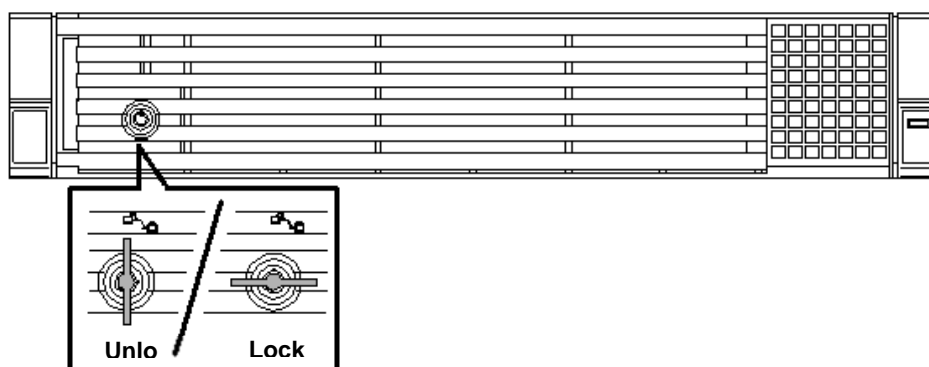
Install the new power supply unit taking steps 3 to 6 of *"Installation"*, and confirm that the power supply unit is installed normally.

## 1.37 Installing Front Bezel

1. When installing the front bezel, align the upper and lower sides of the front bezel.
2. Fit the right side (from the front view) of the front bezel into a recess on the front part of the device, push the left side lever to the right, set in place the left side of the device, and then release the lever so that it will be locked. Check whether the front bezel is securely locked by pulling it lightly in front.



3. Insert the key, and rotate it clockwise while pressing until it is locked into place.



**Important** Be careful not to press the POWER Switch.

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## 2. Installation and Connection

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This section describes how to install the server and connect cables.

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### 2.1 Installation



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This server must be mounted to a rack which conforms to EIA standards for use.

#### 2.1.1 Installing Rack

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Refer to the manual that comes with your rack for how to install the rack, or consult with your sales representative.

 <b>WARNING</b>	
	<p>Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, refer to Safety Precautions and Regulatory Notices.</p> <ul style="list-style-type: none"><li>• Use only in the specified environment.</li><li>• Do not connect the ground wire to a gas pipe.</li></ul>

 <b>CAUTION</b>	
	<p>Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to Safety Precautions and Regulatory Notices.</p> <ul style="list-style-type: none"><li>• Do not carry or install the server only by a single person.</li><li>• Do not install the server so that the load may be concentrated on a specific point.</li><li>• Do not install any components only by a single person. Confirm that hinge pins of the door are completely secured in place.</li><li>• Do not pull out the server from the rack when the rack is unstable.</li><li>• Do not leave more than one device being pulled out from the rack.</li><li>• Do not provide the wiring for the server to exceed the rating of the power supply.</li><li>• Do not use the server in the environment where corrosive gas is generated.</li></ul>

Do not install the rack or server under the following environment. Doing so may cause malfunction of the server.

- Narrow space from which devices cannot be pulled out from the rack completely
- Place that cannot bear the total weights of the rack and devices mounted on the rack
- Place where stabilizers cannot be installed or where the rack can be installed only after the practice of proper earthquake-resistant construction
- Place of uneven or slanting floor
- Place of drastic temperature change (near a heater, air conditioner, or refrigerator)
- Place where intense vibration may be generated
- Place where corrosive gases (sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, ozone, etc) exist. Place where the air (or dust) includes components accelerating corrosion (ex. sulfur, sodium chloride) or conductive metals
- Place where chemicals may be accidentally sprayed over
- Place where a carpet not subject to anti-static process is laid
- Place where some objects may be fallen on the rack
- Place near a device generating intense magnetic field (such as TVs, radios, broadcast/communication antennas, power transmission wires, and electromagnetic cranes) is placed.
- Place where the power cord of the server must be connected to an AC outlet that shares the outlet of another device with large power consumption
- Place near equipment that generates power noise (e.g., contact spark at power-on/power-off of commercial power supply through a relay).
- Environment where operation of the server is not guaranteed

### 2.1.2 Space and air flow requirements

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For easier repairing and improvement of ventilation, follow the space requirements when you determine the install location of the rack.

- Make a clearance of 63.5 cm (25 in.) or more on the front side of the rack.
- Make a clearance of 76.2 cm (30 in.) or more on the back side of the rack.
- Make a clearance of 121.9 cm (48 in.) or more between the back side of the rack and the back side of the other racks or the rack row.

This server take in cold air from the front and discharge the hot air inside from the rear. Therefore, adequate openings able to absorb the air into the cabinet and discharge the heat are required at the front and rear of rack.

**Note**

To prevent improper cooling situations or damages to the equipment, do not block the ventilation openings.

If a server or rack component is not installed on every shelf in the rack, the air flow through the rack or the server will change because the shelf is empty. To maintain adequate ventilation, blank panels should be covered on all the shelves that do not have components installed.

**Note**

Blank panels should be used to cover on all the shelves that do not have components installed. This ensures the adequate ventilation. If a rack without a



blank panel is used, high-temperature damage may occur due to improper cooling.

**Note**

When using racks of other companies, the following additional requirements must be met in order to improve the ventilation for preventing damages to the equipment.

- Front and rear doors - When closing the front or rear doors with a 42U rack, the ventilation holes of 5350 cm<sup>2</sup> (830 sq in.) should be distributed evenly from top to bottom for the proper ventilation (These are equivalent to 64% of the opening required for ventilation).
- Side - Make at least 7 cm (2.75 in.) clearance between the installed rack components and the side panels of the rack. Blank panels should be used to cover on all the shelves that do not have components installed. This ensures the adequate ventilation. If a rack without a blank panel is used, high-temperature damage may occur due to improper cooling.

### 2.1.3 Temperature requirement

The system must be installed or located in well-ventilated and well-controlled places so that the equipment operates safely and properly.

For most server products, the maximum recommended ambient operating temperature (TMRA) is 35°C. The temperature inside the room where the rack is installed should not exceed 35°C.

**Note**

When installing options of other companies, note the following points for preventing damages to the equipment.

- Never block the ventilation around the server with optional equipment, and make sure that temperature inside the rack does not exceed the maximum specifications.
- Make sure that the manufacturer's TMRA specification is not exceeded. When using racks of other companies, the following additional requirements must be met in order to improve the ventilation for preventing damages to the equipment.

### 2.1.4 Power requirements

The installation of this equipment must be performed by a qualified electrician according to the electrical standards of your region regarding to the installation of information technology equipment. This device is designed to operate in the system configuration specified by NFPA 70; 1999 Edition (National Electric Code) and NFPA-75; 1992 (Code for Protection of Electronic Computer/Data Processing Equipment). For the rating of the optional power supply, refer to the rating label of the product or the user document included with the option.

**Important**

**To prevent injuries, fires, or damages to the equipment, the rated load of the AC power supply branch circuit that supplies power to the rack should not be exceeded. For wiring and installation requirements of electrical equipment, contact the power company in your area.**

**Note**

Use a UPS (Uninterruptible power supply) to protect the server from unstable power situation or temporary power outages. The UPS protects the hardware against damages caused by power surges and voltage spikes, and allows the system to continue operation even during a power outage.

If more than one server are installed, additional distribution equipment may require to be used for securely powering all the devices. Follow the guidelines below.

- Make sure that each of the power supply loads is uniform among the available AC power branch circuits.
- Make sure that the AC current load through the entire system does not exceed 80% of AC current rating of the branch circuits.
- Do not use the extension cord with the outlet for general use for this unit.
- Prepare a dedicated electrical circuit on the server.

2.1.5 Grounding Requirements

For proper operation and usage, the server must be properly grounded. In the United States, the equipment must be installed according to the section 250 of NFPA 70, 1999 Edition (National Electric Code) as well as regional building standards. In Canada, the equipment must be installed according to Canadian Standards Association, CSA C 22.1, Canadian Electrical Code. In all other countries, the equipment must be installed according to the Electrical Wiring Rules of your region such as the Codes 364-1 to 7 of International Electrotechnical Commission (IEC). In addition, all types of the distribution equipment used for installation such as branch wires and outlets must be the grounded equipment that is specified or approved.

For preventing high voltage leakage current generated from multiple servers that are connected to the same power supply, we recommend connecting fixedly to the branch circuit of the building, or using a PDU equipped with a non-removable cord connected to the industrial plug. NEMA locking plugs or IEC 60309 compliant plugs are suitable for this purpose. For the server, an extension cord with the outlet for general use is not recommended to be used.

2.1.6 Connecting DC power cable and DC power supply

Important	<p>To prevent injuries due to electric shock or high voltage, observe the following precautions.</p> <ul style="list-style-type: none"><li>• Installation of this equipment should be performed by a trained specialist that is defined in NEC and IEC 60950-1 Second edition "The standard for Safety of Information Technology Equipment."</li><li>• Connect the equipment to the secondary circuit power supply that is properly grounded. The secondary circuit does not have direct connection with the primary circuit, and gains power from a transformer, converter, or equivalent isolation device.</li><li>• The overcurrent protection of the branch circuit should be 27 A.</li></ul>
Important	<p>When installing the DC power supply unit, the ground wire must be connected before connecting the positive or negative electrode lead.</p>
Important	<p>Turn off the power supply before performing the power supply installation procedure or maintenance.</p>
Note	<p>The grounded conductor of the DC supply circuit and the ground conductor are connected each other in the server unit. For details, refer to the document included in the power supply.</p>

**Note**

If the grounded conductor of the DC supply circuit and the ground conductor are DC-connected on the server device, the following conditions must be met.

- This device must be connected directly to the grounded electrode conductor of the DC supply system, or to the bonding jumper from the bar or the bus of the ground terminal of the connection destination.
- This device must be installed in other devices which the grounded conductors of the same DC supply circuit and the ground conductors are connected to, and in the same adjacent area as the DC system ground point (such as an adjacent cabinet). The DC system must be grounded elsewhere.
- The DC source must be installed in the same building where the equipment installed.
- The switches or power-off devices should not be located on the grounded circuit conductor between the DC source and the connection point of the ground electrode conductor.

For connecting the DC power cable to DC power supply, follow the procedure below.

1. Cut the DC power cord at least 150 cm (59.06 in.) in length.
2. If ring tongs are required for the power supply, use a crimping tool to attach the ring tongue to the power cord wire.

**Important**

The ring terminal must conform to UL certified 12 gauge.

**Important**



The minimum nominal diameter for the sled or pillar or stud type terminal should be 3.5 mm (0.138 in.). Also, the diameter of the screw type terminal should be 4.0 mm (0.157 in.).



3. Group together wires of the same color and attach them to the same power supply. The power cord consists of three wires (black, red, and green).

For details, refer to the document included in the power supply.

### 2.1.7 Installing the server to the rack or removing it from the rack

Mount the server to the rack. (This section also describes the removal procedure.)

 <b>WARNING</b>	
	<p>Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, refer to <i>Safety Precautions and Regulatory Notices</i>.</p> <ul style="list-style-type: none"> <li>Do not use any racks out of standards.</li> <li>Use only under the specified environment.</li> </ul>

 <b>CAUTION</b>	
	<p>Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to <i>Safety Precautions and Regulatory Notices</i>.</p> <ul style="list-style-type: none"> <li>Do not drop.</li> <li>Do not leave the server being pulled out.</li> <li>Do not install with the cover removed.</li> <li>Do not get your fingers caught.</li> </ul>

<b>Important</b>	<p><b>Temperature increases and airflow in the rack</b></p> <p>If multiple devices are installed, or if the inside of the rack is not sufficiently ventilated, the internal temperature rises due to the heat emitted from each device, which may result in a malfunction. Review airflow in the rack and room and take sufficient measures so that the internal temperature will not exceed the operational temperature during operation.</p> <p>Air enters the server from the front and exits from the rear.</p>
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## (1) Preparation before installing to the rack

We provide the four types of rails that are to be installed on the rack.

Also, the type of the rail is different depending on the drive model of 2.5-inch or 3.5-inch.

Check the following table for each model.

Model name	N code	Part name	Specification
2.5-inch drive model	N8143-129	Extension rail for 2U rack server	Ball bearing type rack rail for 2.5-inch drive model (no inner rail used)
	N8143-133	Slide rail for 2U rack server	Slide rail type rack rail for 2.5-inch drive model (inner rail used)
3.5-inch drive model	N8143-130	Extension rail for 2U rack server	Ball bearing type rack rail for 3.5-inch drive model (no inner rail used)
	N8143-134	Slide rail for 2U rack server	Slide rail type rack rail for 3.5-inch drive model (inner rail used)

**Important** Rail for left side has different shape from that for right side. Make sure the orientation of rails to properly install them.

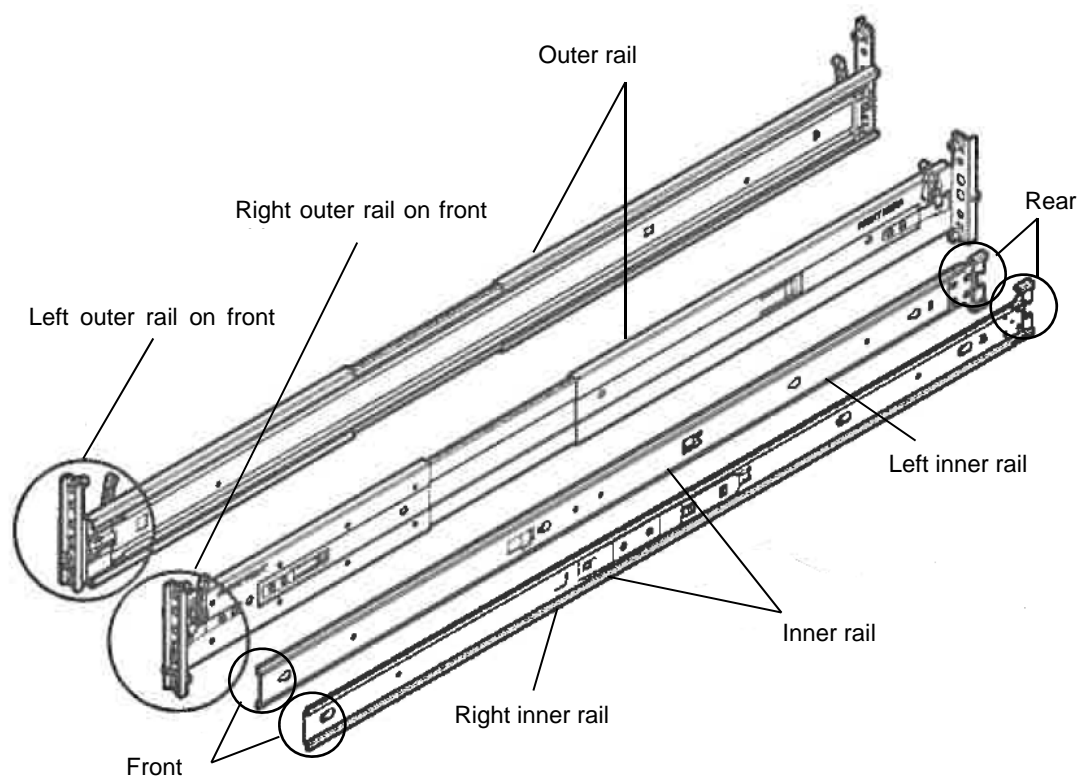
### 1) Slide rail for 2U rack server N8143-133/134

- **Checking the inner and outer rails**

Check the direction of the inner and outer rails.

Since there are markings of "Right" and "Left" on the outer rail, check the proper directions of right and left with it. Likewise, check the directions of front and back with the markings of "Front" and "Rear."

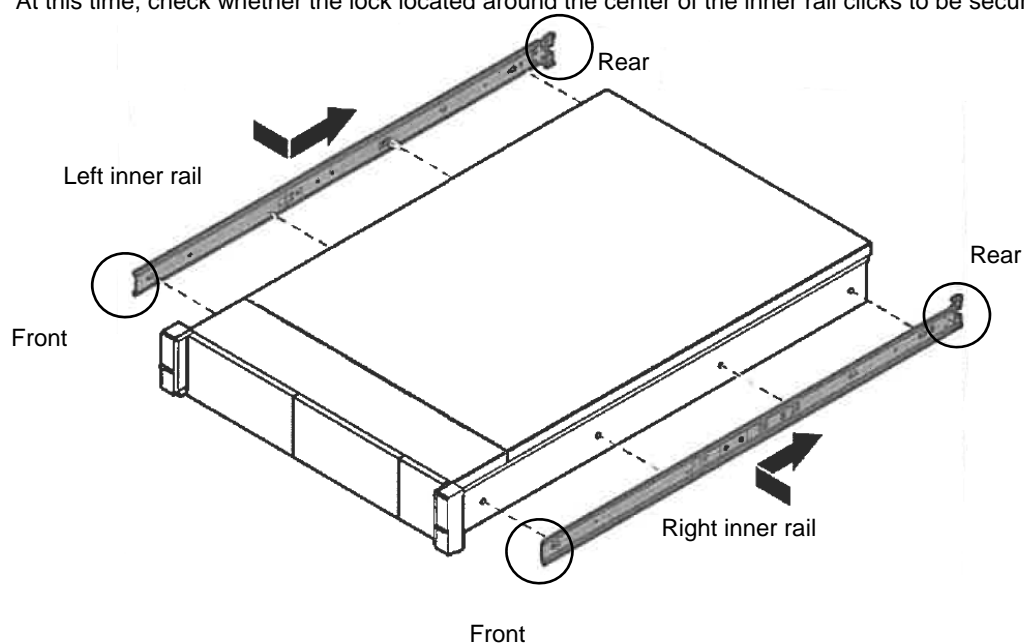
On the inner rail, there is no marking for Front, Rear, Right or Left, so refer to the figure below to check the each direction.



- **Attaching the inner rail to the server**

As seen from the front side of the rack, attach the outer rail (LEFT) to the left, and the outer rail (RIGHT) to the right.

Slide the inner rail to the rear side of the unit, in accordance with the four protrusions on the side of the unit. At this time, check whether the lock located around the center of the inner rail clicks to be securely locked.



- **Removing the inner rail**

Lifting a little the metal plate part located around the center of the inner rail, then the lock will be released. Slide it forward in the unlocked state, and it can be removed

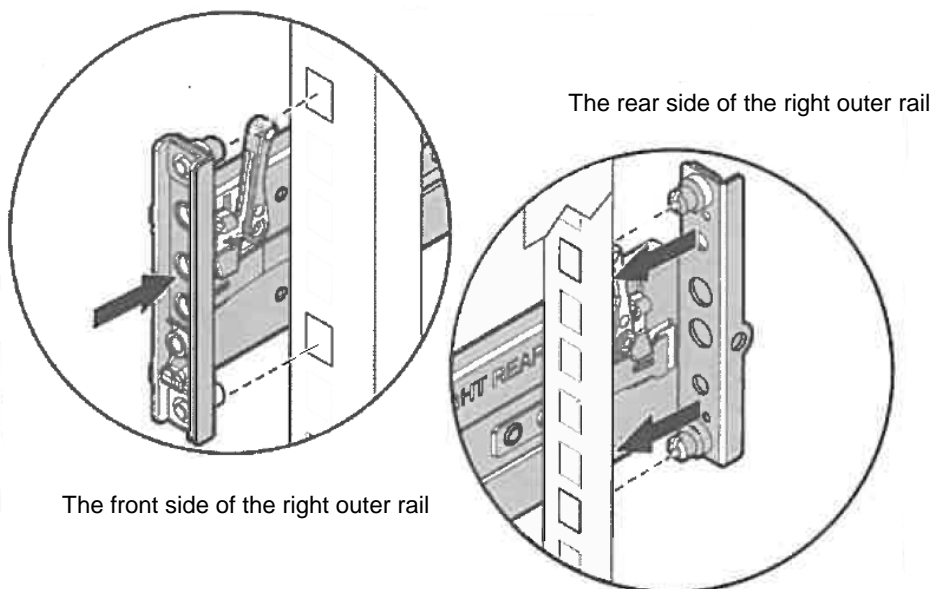
- **Attaching the outer rail to the rack**

Insert the round protrusion on the outer rail into the square hole of the 19-inch rack. Make sure that it makes a clicking sound indicating that it is locked.

The figure on left shows the front side of the right outer rail. The figure on right shows the rear side of the right outer rail.

Install the left outer rail in the same way.

Make sure that the rail is installed at the same height as the other rail already installed.



**Important** Confirm that the rail are securely locked so that they will not fall off.

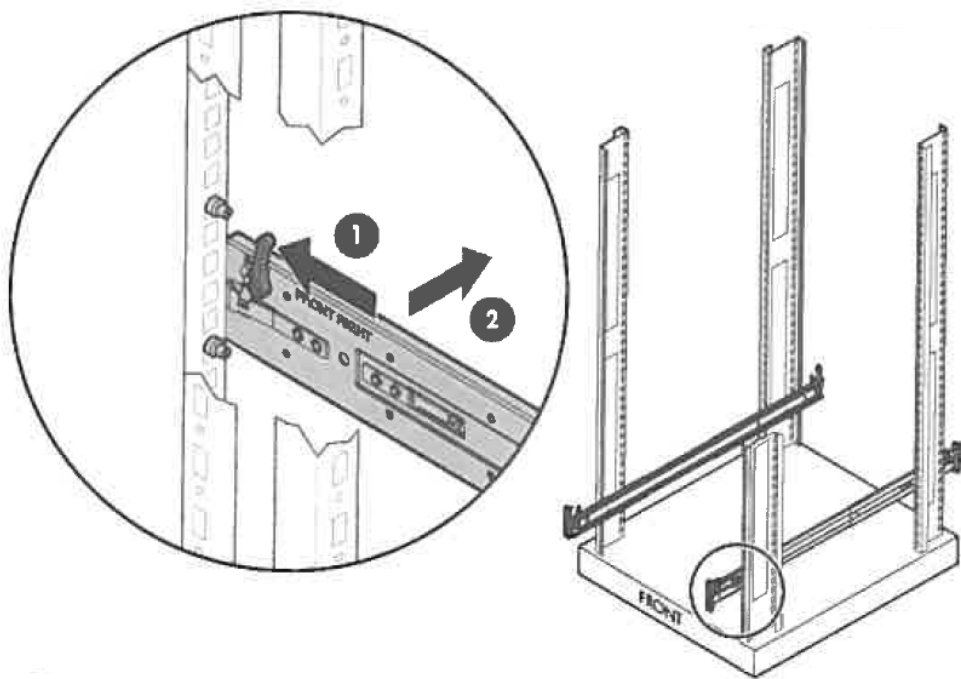
**Tips** Although the rail may be somewhat unsteady, it is not defective.

- **Removing outer rails**

Remove outer rails from the rack in the following procedure.

1. See Chapter 2 (2.1.7 Installing the server to the rack or removing it from the rack, (2) Removal procedure) to remove the server from the rack.
2. Reduce the slide rail of the outer rail. In case the slide rail is locked in the middle, continue pushing the rail stopper on the side of the rail to reduce the slide rail.
3. Push and release the unlocking lever of the outer rail in the direction of the arrow, and push it into the rack to remove it.



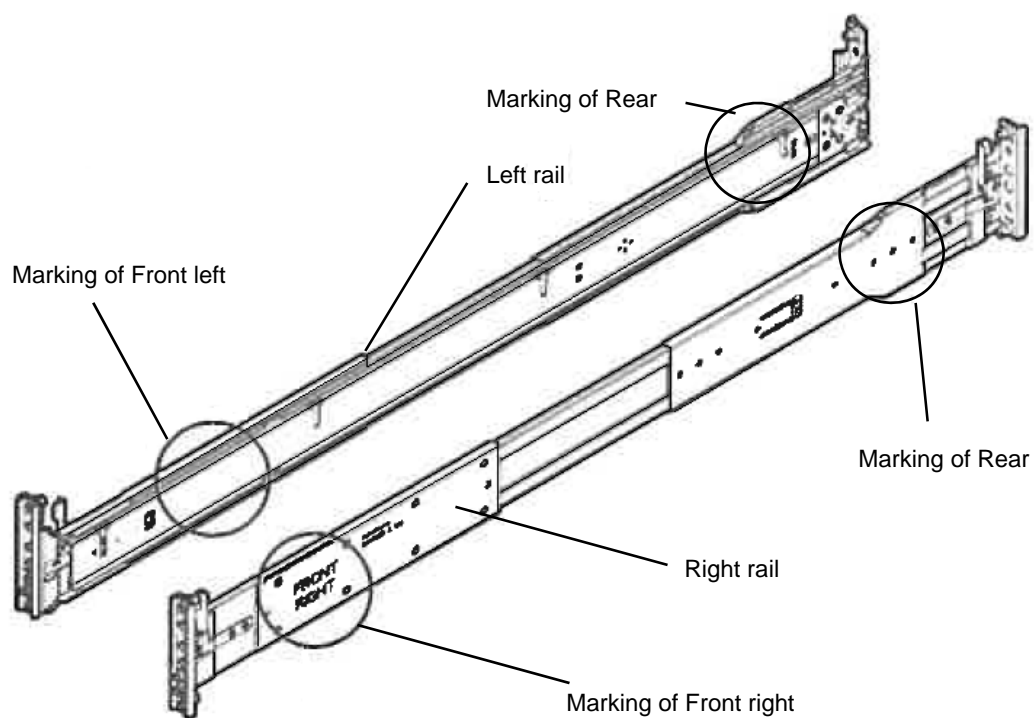


## 2) Extension rail for 2U rack server N8143-129/130

- **Checking the outer rails**

Check the direction of the outer rail.

Since there are markings of "Right" and "Left" on the outer rail, check the proper directions of right and left with it. Likewise, check the directions of front and back with the markings of "Front" and "Rear."



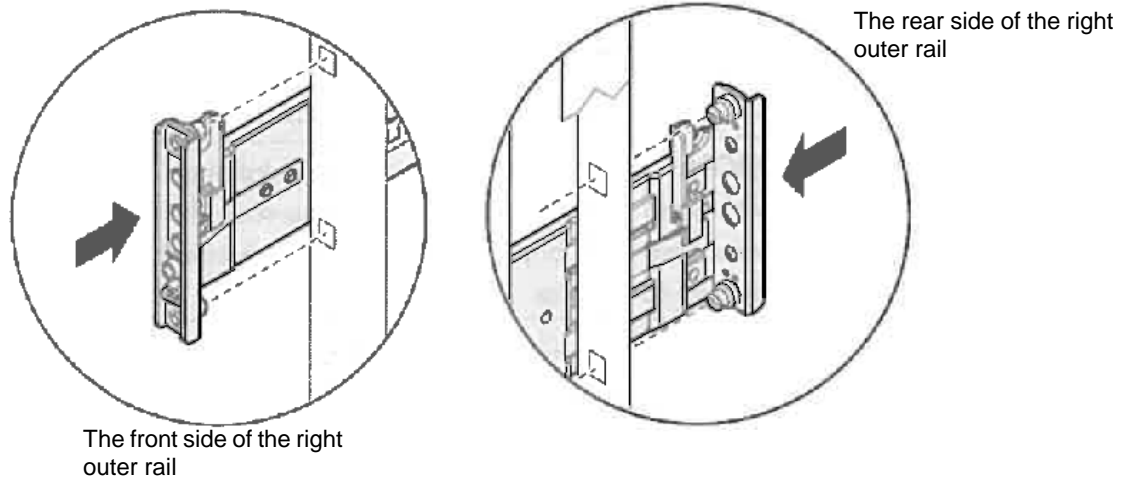
- **Attaching the outer rail to the rack**

Insert the round protrusion on the outer rail into the square hole of the 19-inch rack. Make sure that it makes a clicking sound indicating that it is locked.

The figure on left shows the front side of the right outer rail. The figure on right shows the rear side of the right outer rail.

Install the left outer rail in the same way.

Make sure that the rail is installed at the same height as the other rail already installed.



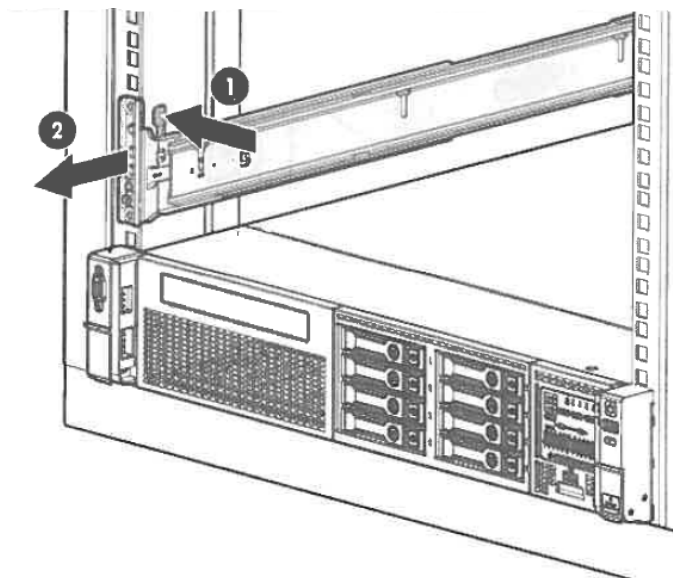
**Important** Confirm that the rail are securely locked so that they will not fall off.

**Tips** Although the rail may be somewhat unsteady, it is not defective.

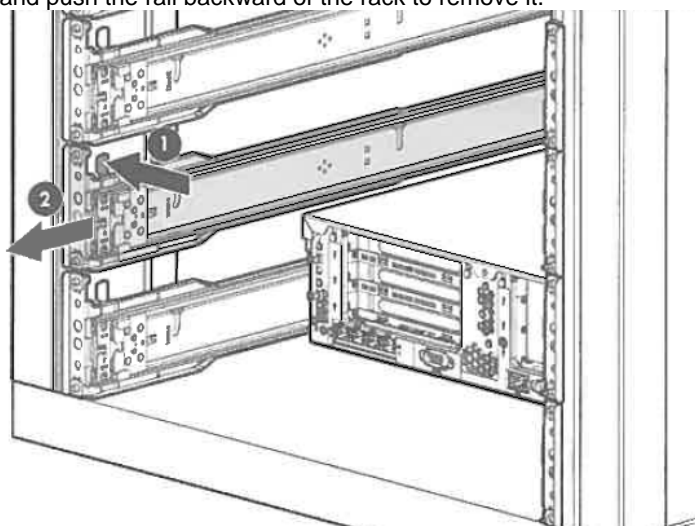
- **Removing the outer rails**

Remove outer rails from the rack in the following procedure.




1. See *Chapter 2 (2.1.7 Installing the server to the rack or removing it from the rack, (2) Removal procedure)* to remove the server from the rack.
2. Push and release the unlocking lever on the front side of the outer rail toward the outside of the rack, and push the rail forward of the rack to remove it.
3. Push and release the unlocking lever on the front side of the outer rail toward the outside of the rack, and push the rail forward of the rack to remove it.



4. Push and release the unlocking lever on the rear side of the outer rail toward the outside of the rack, and push the rail backward of the rack to remove it.



## (2) Installing/removing the server

 <b>CAUTION</b>	
 	<p>Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to Safety Precautions and Regulatory Notices.</p> <ul style="list-style-type: none"> <li>• Do not attempt to lift the server with single person.</li> <li>• Do not drop.</li> <li>• Do not leave the server being pulled out.</li> <li>• Do not install with the cover removed.</li> <li>• Do not get your fingers caught.</li> </ul>

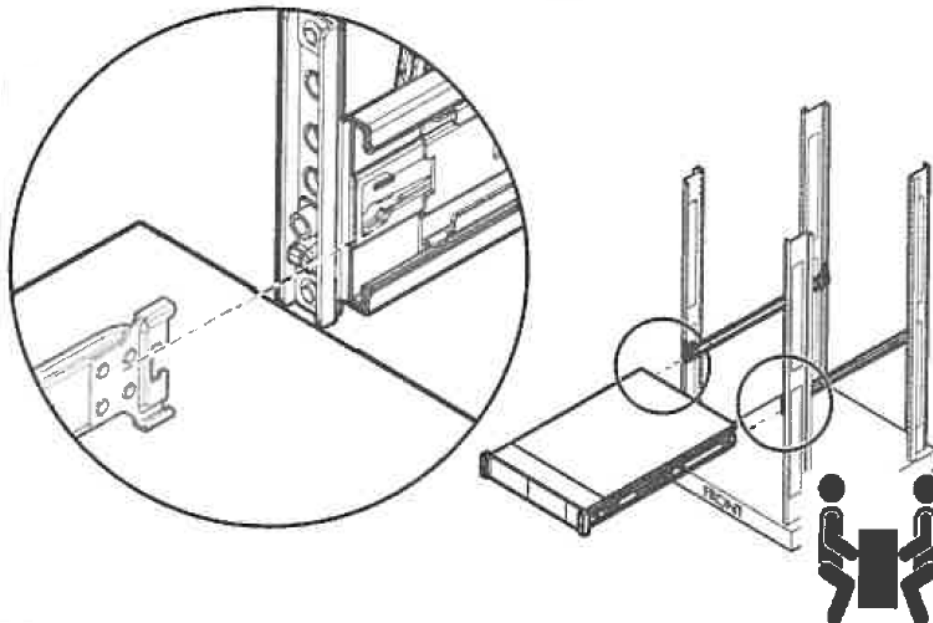
### 1) Slide rail for 2U rack server N8143-133/134

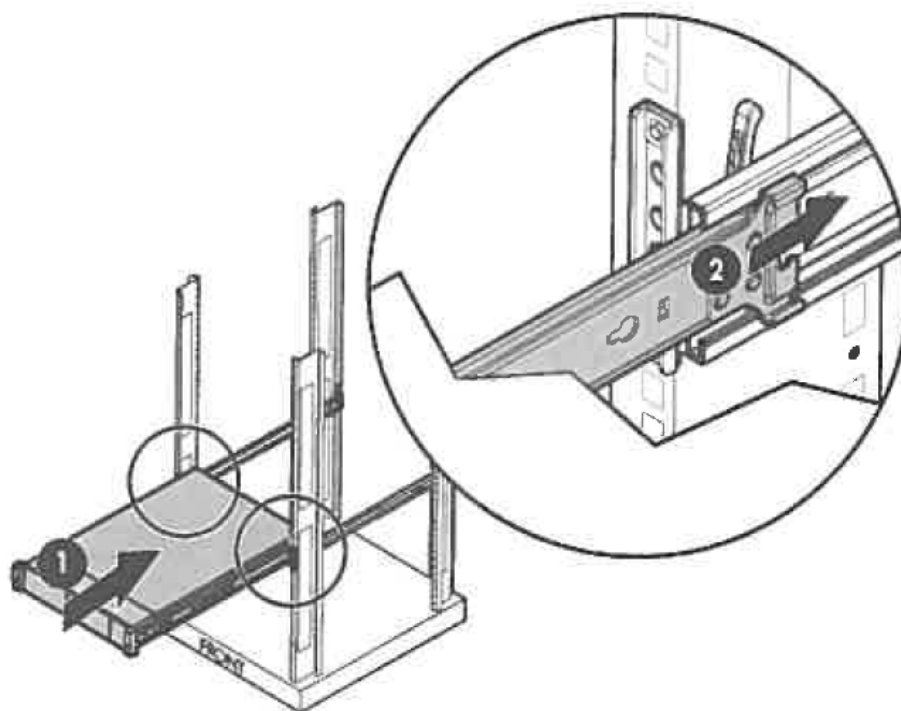
#### (a) Installation

Mount the server to a rack in the following procedure.

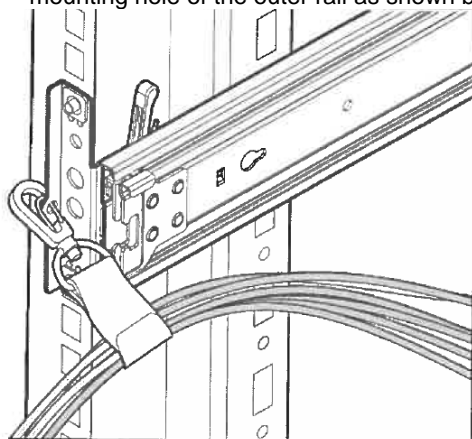
**Important** Always install the server with two or more persons.

1. With two or more persons, firmly hold the server and mount it to the rack.
  2. Make sure the inner rails on both sides are correctly inserted in the outer rail.
- Push the device slowly into the back. Push the front lock until it clicks for the unit to be fixed.

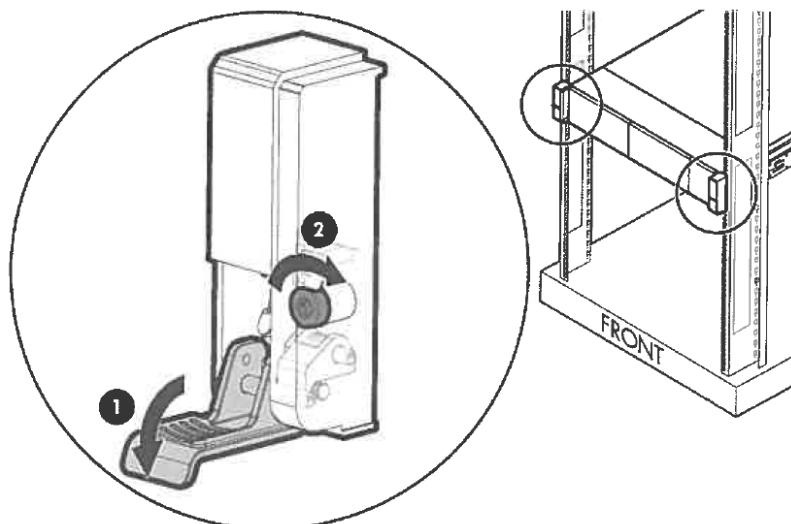




3. If you like to install the included cable tie strip to the rear side of the rack, attach the tie strip to the mounting hole of the outer rail as shown below.



4. If you like to secure the unit to the rack with screw, open the lid of the edge part of the unit and fasten the Hexalobular screw inside with a Hexalobular screwdriver to secure the unit to the rack.

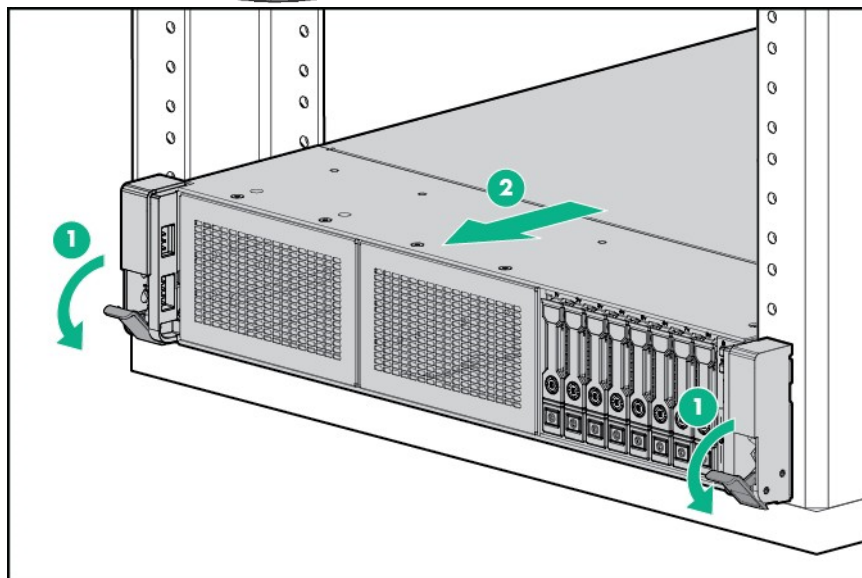
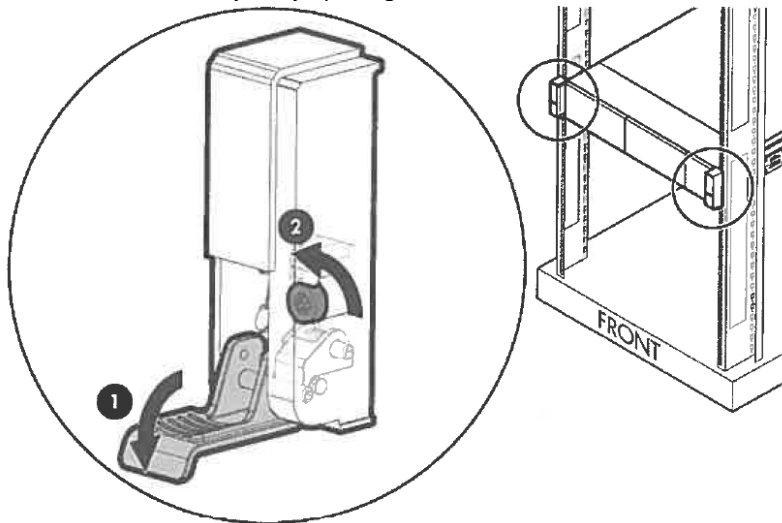


**(b) Removal procedure**

Remove the server from the rack in the following procedure.

**Important** At least two persons are required to remove the server from rack.

1. Make sure that the server is turned off and then disconnect the power cord or all interface cables from the server.
2. Remove the front bezel.
3. Open the lids of the unit fixing screws on both sides of the device. Then remove the fixing screws inside with Hexalobular screwdriver, if the device is screwed on. If the device is not screwed on, you can unlock the device just by opening the lid.



4. Slide the unit forward, and remove from the rack while holding it securely. In case the unit is locked in the middle, continue pushing the rail stopper on the side of the rail and slowly draw out the unit to remove from the rack.

**Important** Be careful not to get your fingers caught in the rails or lever.

**Important**

- While more than one person is supporting the bottom part of the server, slowly pull out the server.
- Do not apply pressure on the server from top when it is being pulled out. Doing so cause the server to drop.

## 2) Extension rail for 2U rack server N8143-129/130

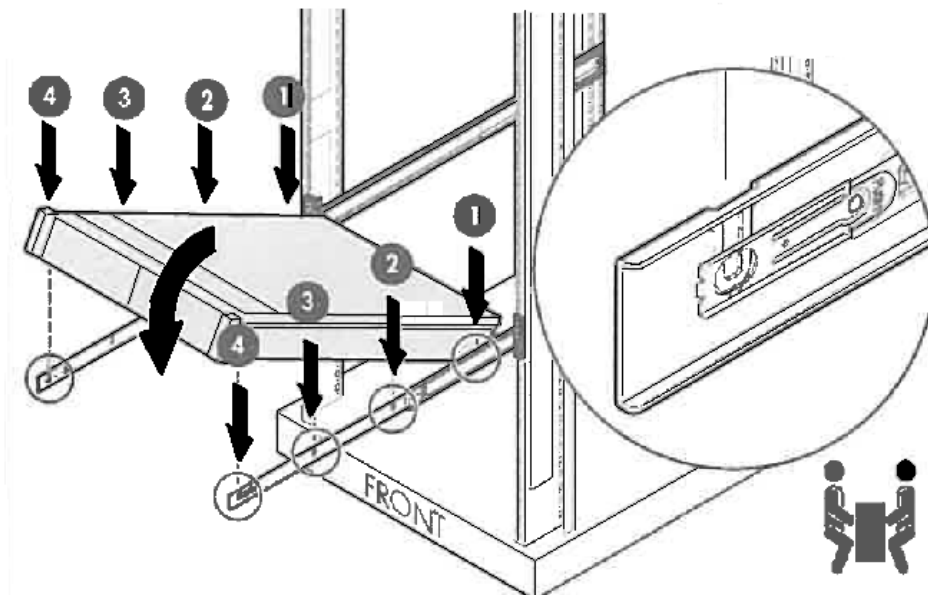
### (a) Installation

Mount the server to a rack in the following procedure.

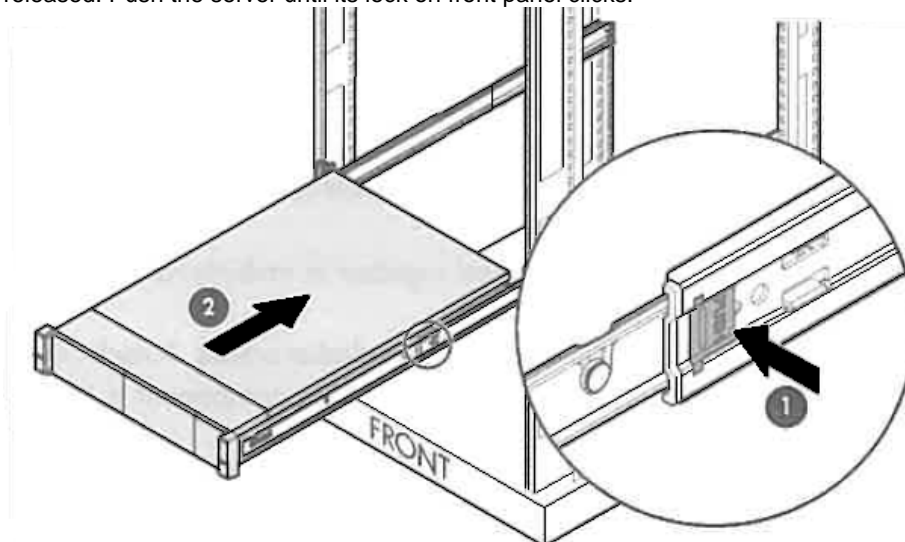
**Important**

**Always install the server with two or more persons.**

1. Pull out the left and right outer rails until they are completely locked to the front side.
2. Hold the unit securely by two or more persons, and lift it to the height of the rack rail.
3. Carefully install the device to the rail while confirming that the protrusion part of the device is correctly inserted in the groove of the rail in the order of 1 → 2 → 3 → 4 on both sides of the outer rail.

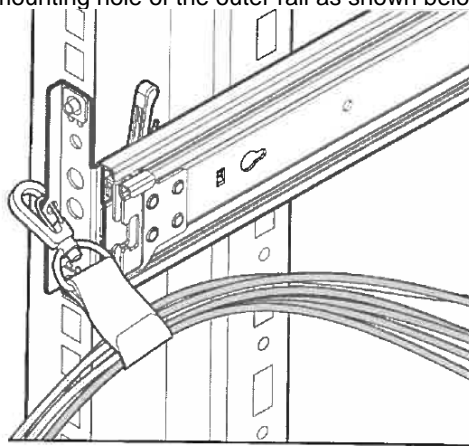


4. Press the lock release button on the side of the rail, and slowly push the device backward with the lock released. Push the server until its lock on front panel clicks.

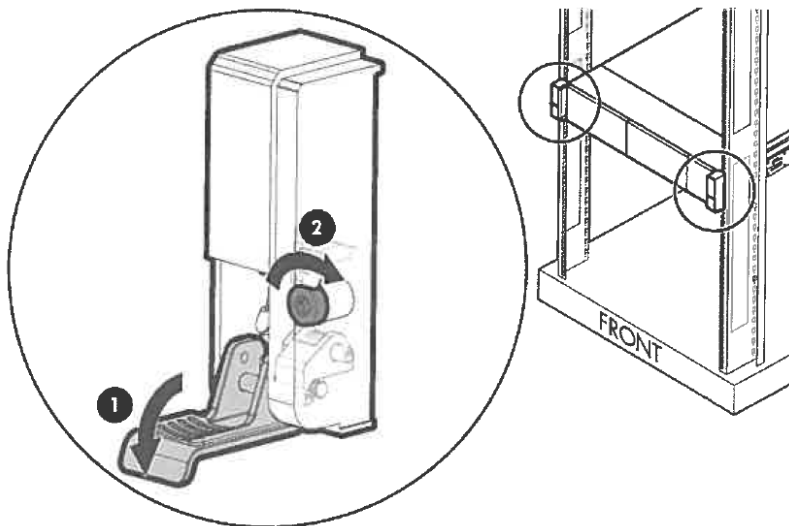




5. If you like to install the included cable tie strip to the rear side of the rack, attach the tie strip to the mounting hole of the outer rail as shown below.



6. If you like to secure the unit to the rack with screw, open the lid of the edge part of the unit and fasten the Hexalobular screw inside with a Hexalobular screwdriver to secure the unit to the rack.



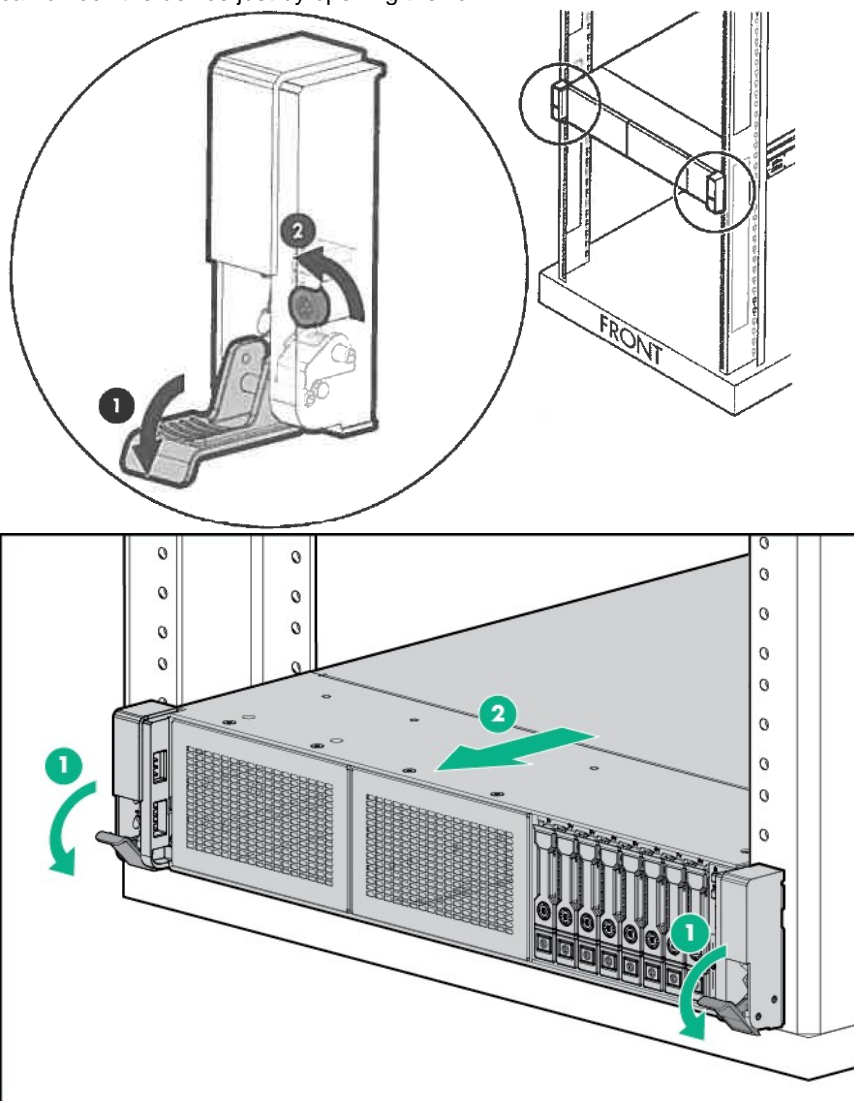
### (b) Removal procedure

Remove the server from the rack in the following procedure.

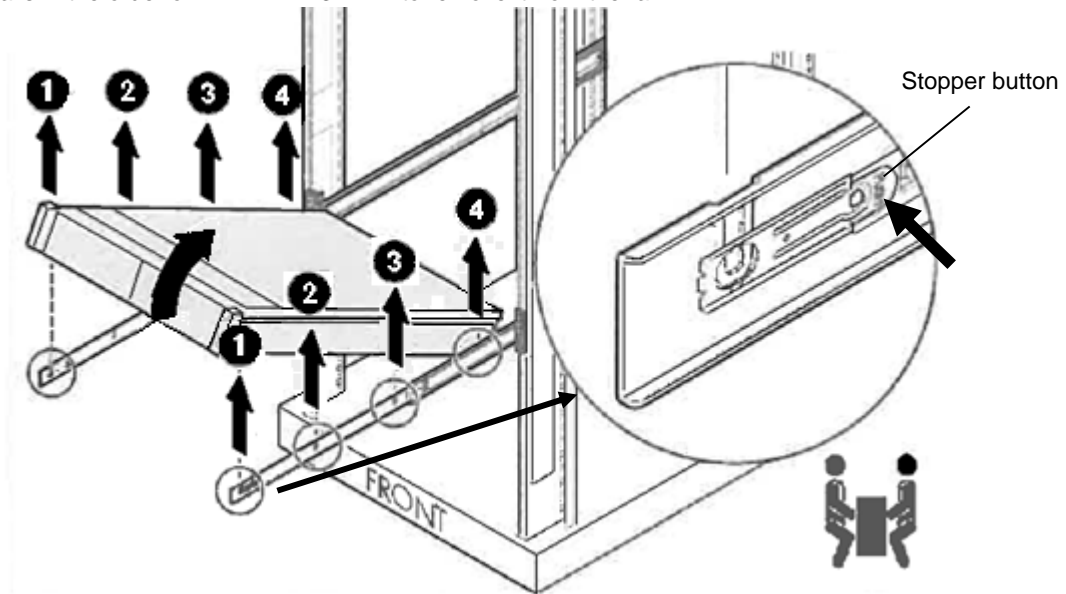
**Important** At least two persons are required to remove the server from rack.

1. Make sure that the server is turned off and then disconnect the power cord or all interface cables from the server.
2. Remove the front bezel.

3. Open the lids of the unit fixing screws on both sides of the device. Then remove the fixing screws inside with Hexalobular screwdriver, if the device is screwed on. If the device is not screwed on, you can unlock the device just by opening the lid.



4. Slide the unit forward until it is locked. For removing the device from the rack, hold the device securely by two or more persons, press the stopper button on the side of the rail, and lift the device above the rails in the order of 1 → 2 → 3 → 4 to remove it from the rail.




**Important** Be careful not to get your fingers caught in the rails or lever.


- Important**
- While more than one person is supporting the bottom part of the server, slowly pull out the server.
  - Do not apply pressure on the server from top when it is being pulled out. Doing so cause the server to drop.

## 2.2 Connection

Connect peripheral devices to the server.


Connectors that allow a variety of peripheral devices to be connected are provided at the front and rear of the server. Images on the following pages show the peripheral devices that can be connected in their standard state and their respective connector positions.


 **WARNING**



Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, refer to Safety Precautions and Regulatory Notices.

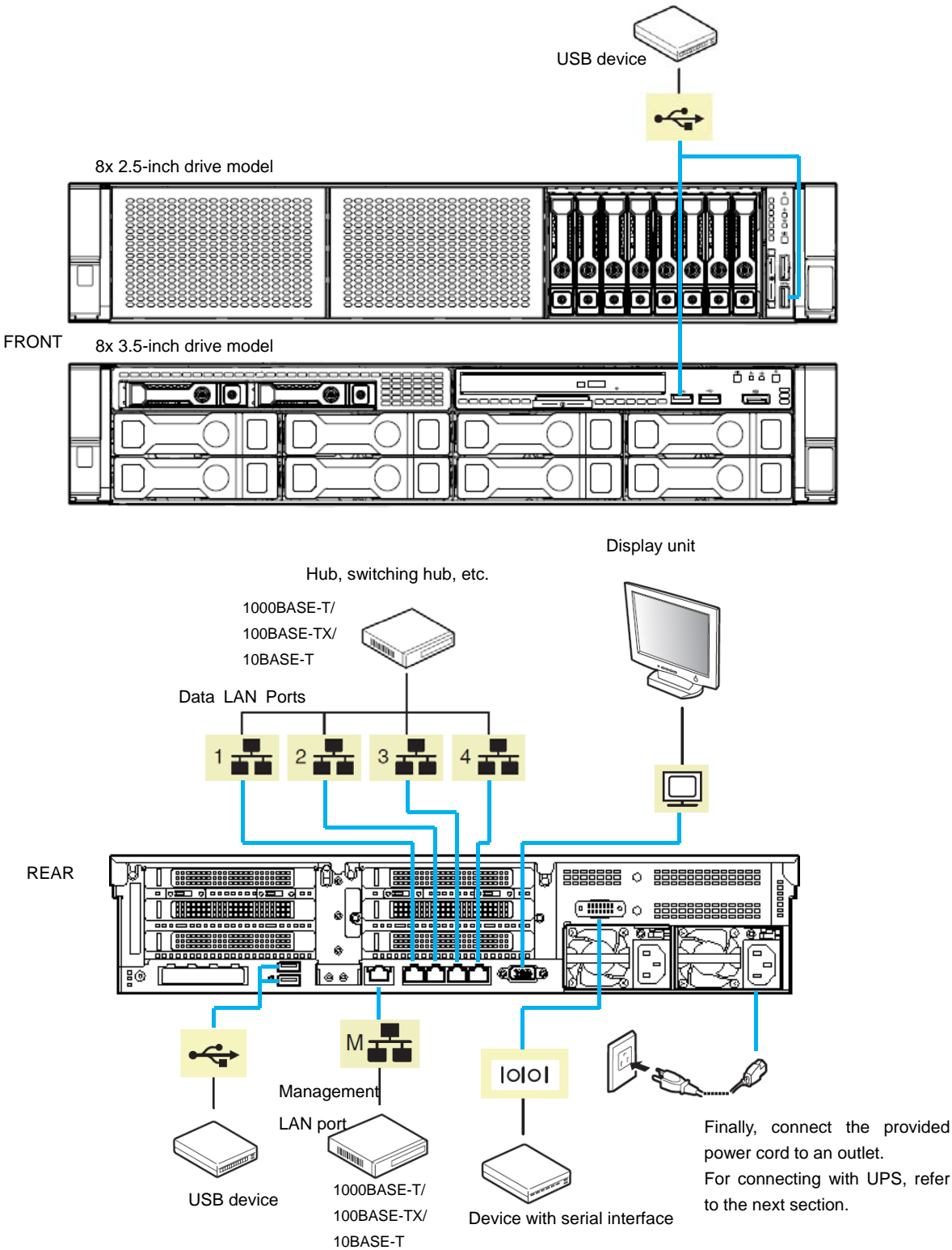
- Do not hold the power plug with wet hands
- Do not connect the ground wire to a gas pipe

 **CAUTION**



Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to Safety Precautions and Regulatory Notices.

- Use only the specified outlet to insert.
- Do not connect the power cord to an outlet that has an illegal number of connections.
- Insert the power plug into the outlet as far as it goes.
- Use only the specified power cord
- Do not connect or disconnect the interface cable with the power plugged in the outlet.
- Use only the specified interface cable



**Tips**

The serial port cannot be used to connect with leased line.

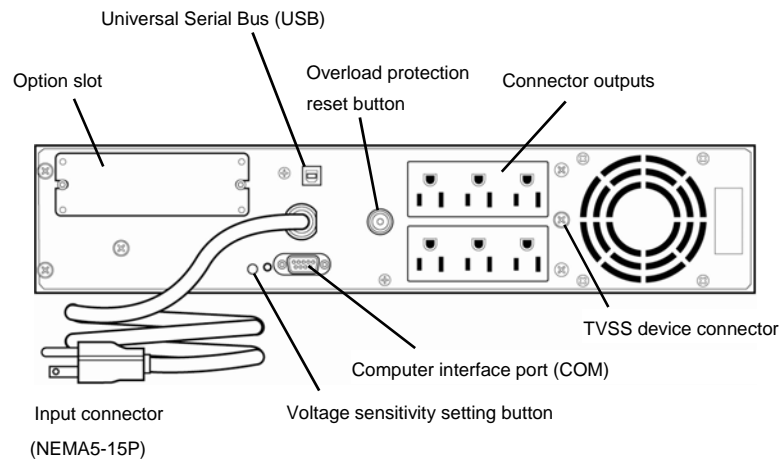
Note the following precautions to connect cables.

- When the device is not Plug and Play device, turn off the server and devices to be connected before connecting.
- If connecting any peripheral device and its interface cable made by other companies (a third party), contact your sales representative to check if they can be used with the server beforehand.
- Fix the power cord or interface cable with cable ties.
- Make sure that no pressure is applied on the plug of power cord.

### 2.2.1 Connecting to Uninterruptible Power Supply (UPS)

To connect the power cord of the server to a UPS, use the connector output on the rear of the UPS. For details, refer to the manual supplied with the UPS.

#### Example



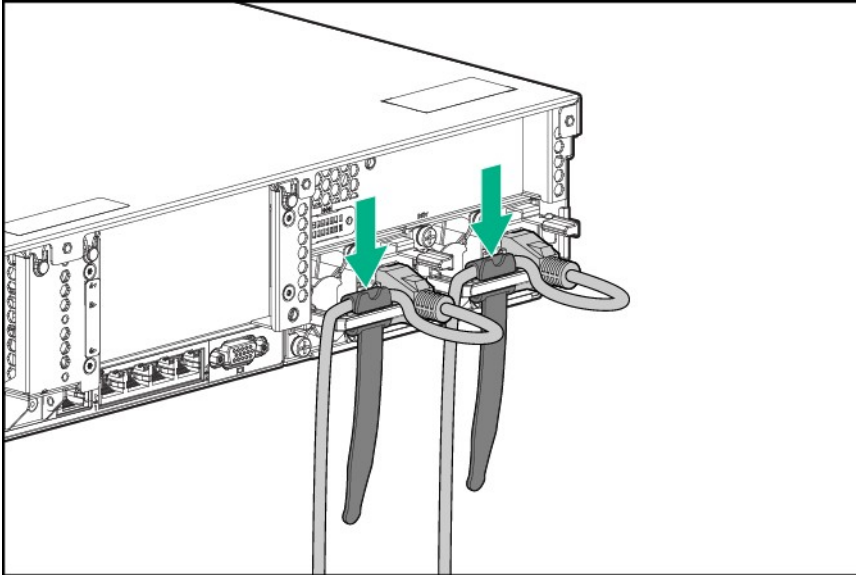
When the power cord is connected to a UPS, change the settings from System Utility in order to link the server with the power supply from the UPS.

To change the settings, select **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Server Availability > Automatic Power-On**. Select **Always Power On** to perform automatic operations by using the UPS. For details, see *Chapter 3 (2. Description on System Utility)*.

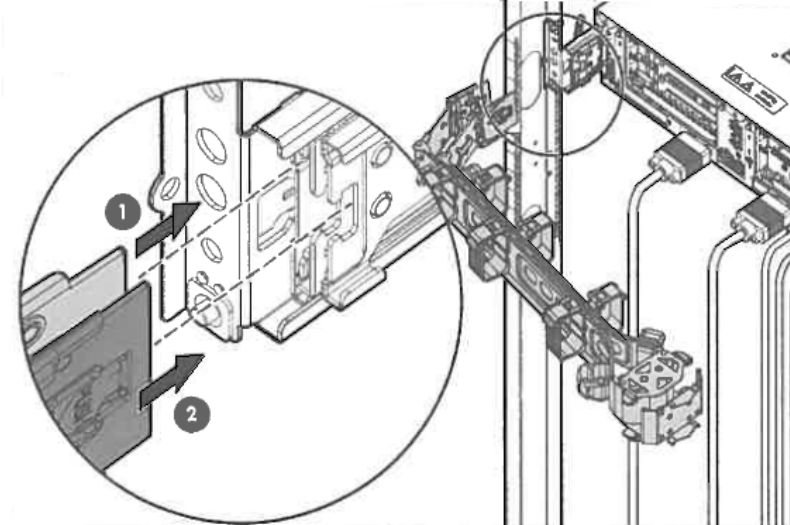
### 2.2.2 Installing the cable management arm

A cable management arm can be installed to the unit for combining the multiple cables connected to the device. Install the cable management arm in the following steps.

- 1) Attach the power cord anchor.

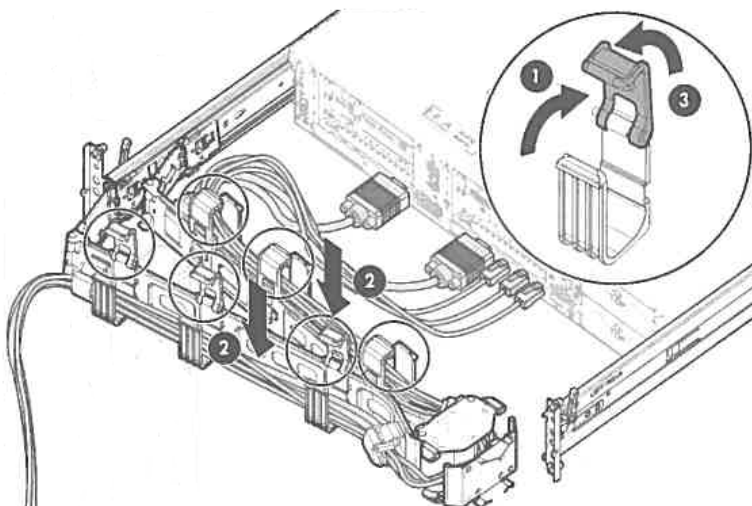


- 2) Insert the two fixed parts of the cable management arm into the outer rail and the inner rail behind the rack.

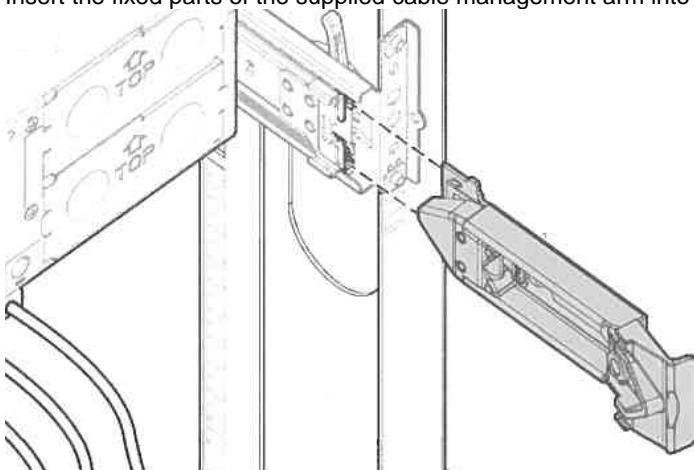




- 3) Put multiple cables in the binding belt and secure them.

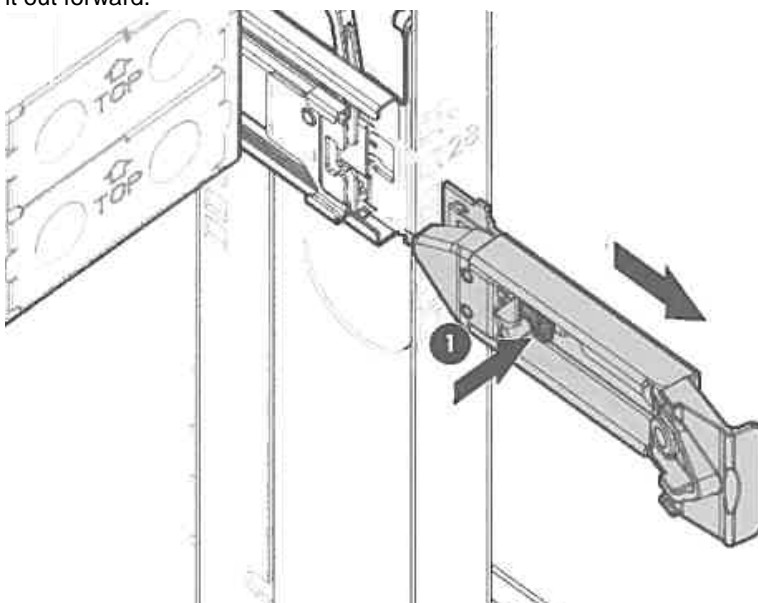


- 4) Insert the fixed parts of the supplied cable management arm into the outer rail on the opposite side.

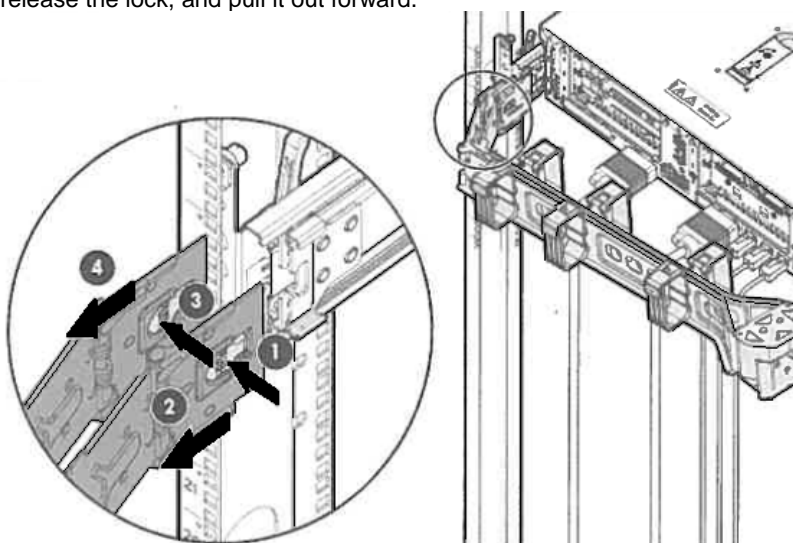


### 2.2.3 Removing the cable management arm

- 1) Press the lock release button on the fixed part of the cable management arm to release the lock, and pull it out forward.



- 2) Press the lock release button on the two fixed part on the opposite side of the cable management arm to release the lock, and pull it out forward.



# NEC Express5800 Series Express5800/R120h-2M

# 3

## Setup

This chapter describes how to set up the server.

### 1. Turning on the Server

Power-On Self-Test (POST) is explained in this section.

### 2. Description of system utility

Describes how to set up the system.

### 3. iLO 5

Describes iLO 5 installed in the unit.

### 4. EXPRESSBUILDER and Starter Pack

EXPRESSBUILDER helps you to install Windows and maintain the server.

### 5. Installing Software Components

You can install Windows and bundled software by following the instructions in *Installation Guide (Windows)*.

### 6. Turning off the Server

Turn off power when not using the server

---

## ***1.* Turning on the Server**

---

Pressing POWER Switch at the front of the server turns on the server.

Turn on the server by using the following procedure.

1. Turn on a display, an Uninterruptible Power Supply (UPS), and other peripherals.

**Note**

If the power cord is connected with the power supply control unit such as uninterruptible power supply (UPS), make sure that the power supply control unit is turned ON.

2. Remove Front Bezel.
3. When the STATUS lamp flashes green (once per second), wait until the lamp lights in steady state.
4. Press POWER Switch at the front of the server.

POWER LED flashes green (once per second) and after a while, logo appears on the display.

**Important**

**Do not connect/disconnect USB devices during POST execution.**

While NEC logo is being displayed, the self-diagnostic program (POST) runs and diagnoses the hardware. For details, see *Chapter 3 (1.1 POST)*.

---

## 1.1 POST

---

Power-On Self-Test (POST) is a self-diagnostic program stored in the server as standard. POST automatically runs immediately after the server is turned on and checks the motherboard, memory, and processor (CPU). POST also displays the start-up messages of different utilities during the operation.

Usually, you do not need to check the contents of POST. However, check messages displayed at POST in the following cases.

- When introducing a server
- If you suspect a failure
- When any error message is displayed

---

### 1.1.1 POST sequence

---

Explains how POST runs in order.

1. When the server is turned on, POST starts, and an initialization message is displayed. The message to tell initialization of a memory and a PCI device.

**Note**

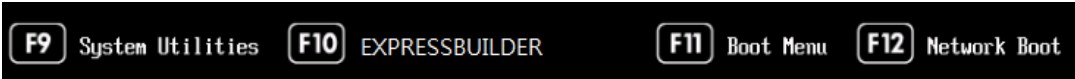
- While the initialization messages are being displayed, the screen may change several times. There is no problem in operation by this.
- If an option VGA controller is connected, or depending on system utility settings, logos or initialization messages may not be displayed.
- Initialization message is shown also in the console redial screen in the serial port.

2. In System Utility, by setting up your password in **Set Power On Password** under **System Configuration > BIOS/Platform Configuration (RBSU) > Server Security** menu, a screen to enter your password is displayed during post. If you enter the incorrect password three times consecutively, POST aborts. (You can no longer proceed.) In this case, power off the server, and power it on.

**Important**

**Do not set a password before OS is installed.**

3. After a while, the following message is displayed on the screen. (The on-screen message depends on your environment.)



By pressing the function key following messages, you can call the functions below upon completion of POST.

- <F9> key: Start System Utility. See *Chapter 3 (2 Description on System Utility)*.
- <F10> key: Run EXPRESSBUILDER. For details, see *Chapter 3 (4. EXPRESSBUILDER and Starter Pack)*.
- <F11> key: Start Boot Menu. See *Chapter 3 (2 Description on System Utility)*.
- <F12> key: Boot from network.

Regarding designated utilities, see instruction documents attached to each option board.

Necessary key inputs are different depending on option boards installed, so you are requested to operate according to messages.

4. The OS starts when POST is completed.

Tips

When no bootable device is connected, the following message is displayed by terminating POST.

- No bootable devices were detected
- Please attach a UEFI bootable device.
- System will automatically retry the UEFI Boot Order in x seconds.

### 1.1.2 POST error messages

When POST detects an error, it displays an error message on the screen. For descriptions of error messages, causes, and countermeasures, see *Chapter 3 (1. IML Error Message)* in "*Maintenance Guide*".

Note

Tell the indication displayed on display unit your sales representative. Alarm messages are useful information for maintenance.

---

## 2. Description on System Utility

---

Here we describe System Utility. You need to fully understand the content and configure correctly.

---

### 2.1 Overview

---

System Utility is a utility to set up this device. This utility is installed in a flash memory in the server as standard and can be run without requiring a media for boot.

Since the device is delivered with optimum set-up, in almost all cases no change is required. **Use only when the case applies to any of cases described in Chapter 3 (2.4 Cases that Require Configuration).**

By using System Utility, wide variety of set-ups as follows become possible.

- Configuration of the system device and options installed.
- Enabling and disabling system functions
- Display of system information
- Selection of Primary Boot Controller
- Configuration of Memory Option
- Selection of language
- Start of pre-boot environment such as built-in UEFI shell or EXPRESSBUILDER.

Regarding the details of System Utility, see *Chapter 2 (1. System Utility) of Maintenance Guide*.

---

### 2.2 Starting SETUP Utility

---

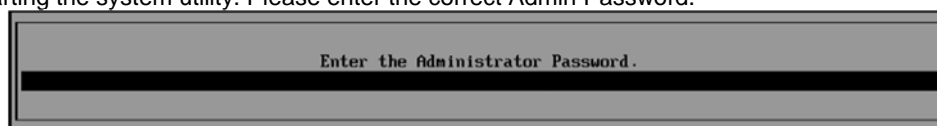
Run POST following *Chapter 3 (1.1.1 POST sequence)*.

After a while, the following message is displayed on the screen. (The on-screen message depends on your environment.)



By pressing <F9> Key here, System Utility starts after POST is completed.

Furthermore, if an Admin Password has been set, a dialog box for password input will be displayed before starting the system utility. Please enter the correct Admin Password.



You can enter password three times. **If you enter wrong passwords three times in a row, further entry of password is rejected.**



To enter password again, reboot the server.

To save your change in System Utility and exit, press <F12> Key (F12: Save and Exit). In case you cancel your change and exit, press <ESC> Key (Exit).

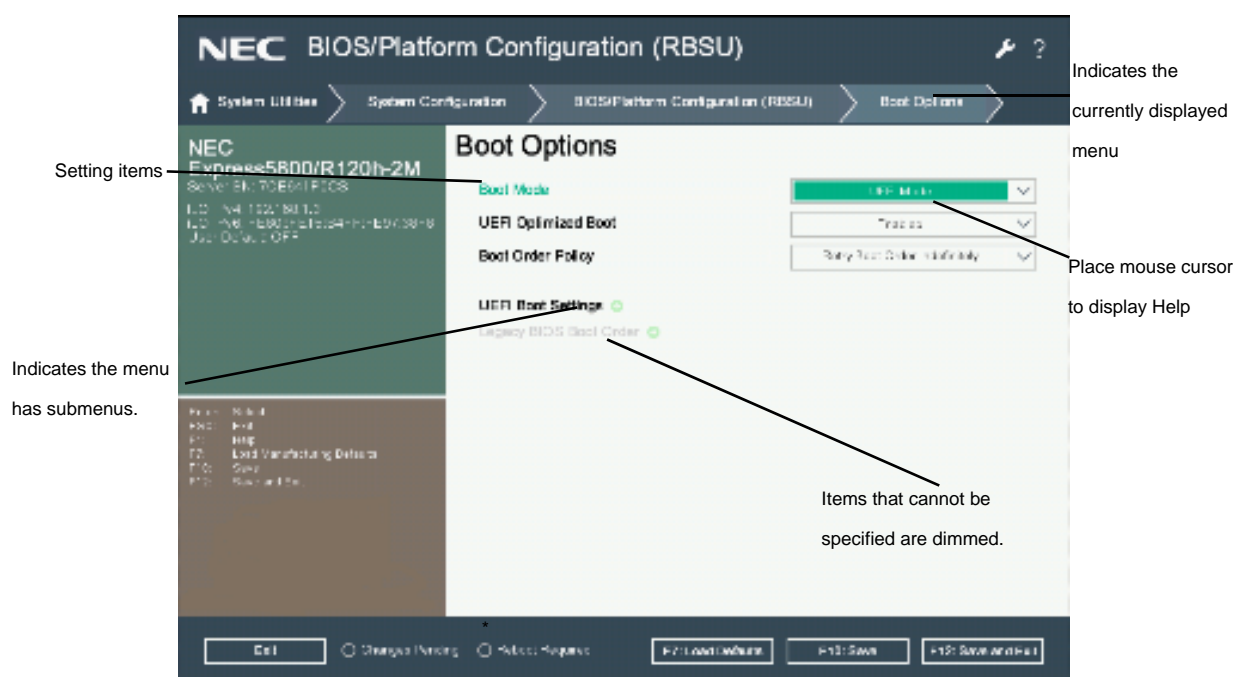
**Tips**

- To put the setting back to the default values, press <F7> Key (F7: Load Defaults).
- The default value might be different from the factory setting.
- **iSCSI Configuration** menu in **Network Options** menu cannot be put back to the default values.

The default language of System Utility is English.

## 2.3 Description on On-Screen Items and Key Usage

Here we describe the operation of System Utility. **Use keyboard and mouse to operate System Utility.**



- Cursor keys (<↑>, <↓>, <←>, <→>)

Select an item displayed on the screen. If characters of an item are highlighted, that means the item is currently selected.

- <←> key / <+> key

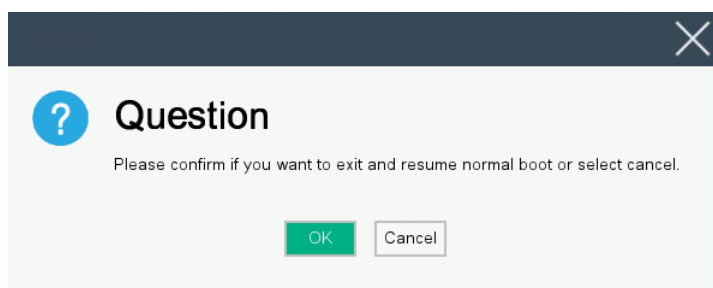
Change the value (parameter) of the selected item. You cannot use this key when a menu which has on the left is selected.

- <Enter> key

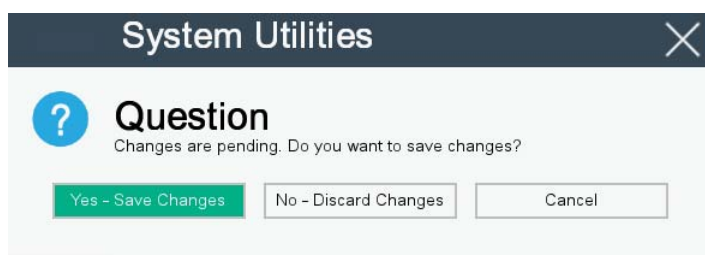
Press this key to determine the selected parameter.

- <Esc> key

Pressing this key cancels pop-up window. On the submenu, pressing this key takes you to the previous screen. On the top menu, the following window is displayed. Choose **OK** to close System Utility.



In case the setting has been changed, the following screen is displayed. To put the changed parameters back to the original setting, select **No - Discard Changes**.

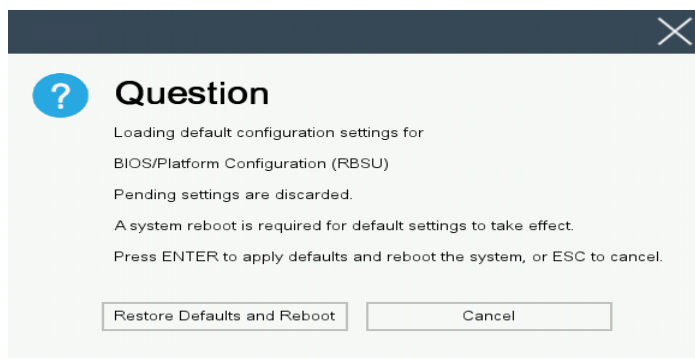


□ <F1> key

Press this key to display help information. Press this key when you have any questions about the operation of System Utility. Press <Esc> key to go back to the original screen.

□ <F7> key

The following screen is displayed. To put the parameters of System Utility back to the default setting, select **Restore Defaults and Reboot**. This operates in the same manner as **Restore Default System Settings** in the **System Default Options** menu. For details, refer to *Chapter 2 (1. System Utilities)* in the *Maintenance Guide*.



**Note**

iSCSI Configuration menu in Network Options menu cannot be put back to the default setting.

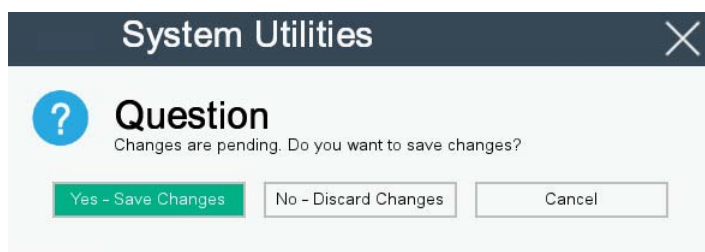
□ <F10> key

The following screen is displayed. To save parameters you set, select **Yes**.

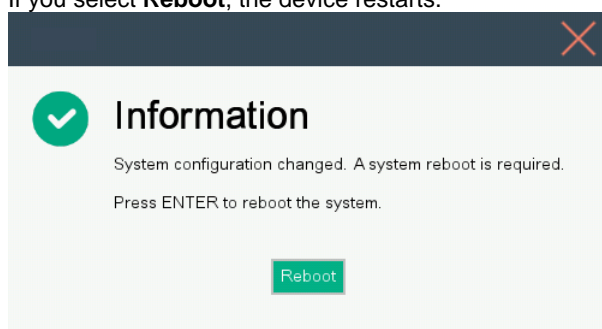


□ <F12> key

The following screen is displayed. If you choose **Yes**, the parameter you set is saved and then a message urging to reboot is displayed.



If you select **Reboot**, the device restarts.



## 2.4 Cases that Require Configuration

If any of the following cases are applicable, operate in System Utility to change parameters from the factory preset. Other than cases described below, do not change the settings. The catalog of parameters in System Utility and the factory presets can be found in **Chapter 2 (1. System Utility) of Maintenance Guide.**

(1/3)

Category	Description	To be changed	Remark
Settings to be saved in the user default	Items to be set at all times	Set to <b>Allow Operation with Critical Fan Failure</b> at <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; Advanced Options &gt; Fan and Thermal Options &gt; Fan Failure Policy</b> .	At the time of shipment, <b>Fan Failure Policy</b> is set to <b>Allow Operation with Critical Fan Failures</b> .
		Set <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; System Options &gt; USB Options &gt; Internal SD Card Slot</b> to <b>Disabled</b> .	At the time of shipment, <b>Internal SD Card Slot</b> is set to <b>Disabled</b> .
	Setting up the <b>Time Format</b> in accordance with your OS	<ul style="list-style-type: none"> <li>If you use Windows</li> </ul> Set to <b>Local Time</b> at <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; Date and Time - Time Format</b> . (Included in line 16)	Set up following the pre-install checklists in the installation guide below. For Windows: Chapter 1 Installing Windows
		<ul style="list-style-type: none"> <li>If you use Linux</li> </ul> Set <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; Date and Time - Time Format</b> to <b>Coordinated Universal Time (UTC)</b> .	Set up following the pre-install checklists in the installation guide below. For Linux: Chapter 1 Installing Linux
		<ul style="list-style-type: none"> <li>If you use another OS</li> </ul> Set up following the pre-install checklist in the installation guide of your OS.	
	If you use the ESMPro/ServerAgent Service	Set to <b>Disabled</b> at <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; Advanced Options &gt; Fan and Thermal Options &gt; Thermal Shutdown</b> .	At the time of high temperature, shutdown is executed by ESMPro/ServerAgent Service.
Basic	Change date and time	Fix the date as follows; <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; Date and Time - Date</b> . Then, fix the time as follows <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; Date and Time - Time</b>	
	Setting up <b>Time Zone</b> when <b>Time Format</b> is set to <b>UTC</b>	<ul style="list-style-type: none"> <li>If you use the device in Japan</li> </ul> Set <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; Date and Time - Time Zone</b> to <b>UTC+09:00</b> .	

(2/3)

Category	Description	To be changed	Remark
Memory	Use memory RAS feature	Set <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; System Options &gt; Memory Operations - Advanced Memory Protection</b>	Some of RAS features may not be used depending on DIMM configuration.
Optional board	Start the system from installed option board.	Set to <b>Enabled</b> in <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; PCIe Device Configuration &gt; SlotXX - PCIe Option ROM</b> .	XX is PCI slot number of the installed option board
Boot	Set the Boot Mode to UEFI Mode according to your OS.	Change <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; Boot Options - Boot Mode to UEFI Mode</b> *1 <ul style="list-style-type: none"> <li>The following OSs are applicable. <ul style="list-style-type: none"> <li>Windows Server 2012 R2</li> <li>Windows Server 2016</li> <li>VMware ESXi6</li> <li>VMware ESXi6.5</li> </ul> </li> </ul>	The setting must be done in compliance with the checklist before setup in the installation guide of your OS For Windows: [Chapter 1 Installing Windows]
	Set the Boot Mode to Legacy BIOS Mode according to your OS.	Change <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; Boot Options - Boot Mode to Legacy BIOS Mode</b> *1	The setting must be done in compliance with the checklist before setup in the installation guide of your OS
	Change the boot order of devices	In case <b>Boot Mode</b> is <b>UEFI Mode</b> , change the boot order in <b>System Configuration &gt; BIOS... (RBSU) &gt; Boot Options &gt; UEFI Boot Settings - UEFI boot Order Control</b> In case <b>Boot Mode</b> is <b>Legacy BIOS Mode</b> , change the boot order in <b>System Configuration &gt; BIOS... (RBSU) &gt; Boot Options - Legacy BIOS Boot Order</b> .	<b><u>When you use CD/DVD, set CD/DVD to the highest priority.</u></b>
	Use console redirection feature	Configure in <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; System Options &gt; Serial Port Options &gt; BIOS Serial Console and EMS</b>	In console redirection connection, if the corrupted text is displayed on terminal screen, change font type (character code) appropriate to your environment.

(3/3)

Category	Description	To be changed	Remark
Boot	Enable X2APIC feature according to your OS.	Advanced > Processor Configuration > X2APIC > Disabled *1 <ul style="list-style-type: none"> <li>• Disable X2APIC for the following OS. <ul style="list-style-type: none"> <li>— Windows Server 2012 R2</li> <li>— Windows Server 2016</li> <li>— VMware ESXi 6</li> <li>— VMware ESXi 6.5</li> </ul> </li> </ul>	The setting must be done in compliance with the checklist before setup in the installation guide of your OS For Windows: [Chapter 1 Installing Windows]
Security	Set a password	Set your password in <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; Server Security - Set Admin Password</b>	If you set your password, you are prompted to enter the password from the next time you start System Utility
	Restrict bootup by entering password	Set your password in <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; Server Security</b> using <b>Set Power On Password</b>	If you set your password, you are prompted to enter the password from the next time you start the system
	To make Intel(R) TXT(Trusted Execution Technology), which is needed for tboot(Trusted Boot), enabled	Install optional TPM kit and set to <b>Enabled</b> in <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; Server Security - Intel (R) TXT Support</b> .	Do not disable TPM with the TPM management module after setting [TXT Support] to [Enabled] to start OS. You may not be able to change [TPM Support] and [TXT Support]. In that case, execute [F7: Load Defaults].
UPS Powerlink	When the server is supplied with power from UPS, always turn on the power.	Set to <b>Always Power On</b> in <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; System Options &gt; Server Availability - Automatic Power-On</b>	If you connect UPS via RS232C, make console redirection setting invalid from System Utility (set to <b>Disabled</b> in <b>BIOS Serial Console Port</b> ).
	If it is turned off by using POWER switch, leave it OFF even when UPS supplies power.	Set to <b>Restore Last Power Stats</b> in <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; System Options &gt; Server Availability - Automatic Power-On</b>	
	Keep the power OFF even when UPS supplies power.	Set to <b>Always Power Off</b> in <b>System Configuration &gt; BIOS/Platform Configuration (RBSU) &gt; System Options &gt; Server Availability - Automatic Power-On</b>	

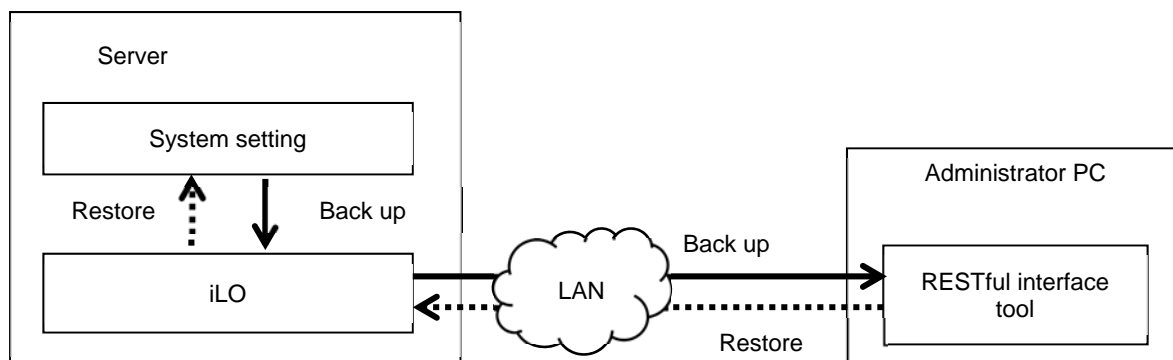
\*1 The factory setting is that "the Boot Mode menu" is set as "UEFI" and "the X2APIC menu" is set as "Enabled".



## 2.5 System Configuration via Network

### 2.5.1 Overview

By using RESTful Interface Tool, which is provided as one of the server administration tool, you can backup and restore your system configuration.



#### □ Back up

The backup of system configuration is established by downloading JSON format file describing system configuration (hereafter called “System Configuration File”) via ILO of controlled server.

- The power of the server is OFF
- OS is running

You cannot backup under the following situations.

- Immediately after the power is turned OFF
- While POST
- Immediately after POST

#### Tips

- After completion of POST execution or the powering OFF, it may take several minutes to reach downloadable state. Please wait for a while to start download.
- The time required to reach downloadable state may vary depending on configuration or operating status of the unit.

#### □ Restore

The restore of system configuration is established by uploading system configuration file from the administrator PC via iLO of controlled server. The system configuration uploaded is reflected at the next boot. Restore is possible only when the device is in the following conditions.

- The power of the server is OFF
- OS is running

Restore is not possible under the following condition.

- Immediately after the power is turned OFF
- While POST
- Immediately after POST

#### Tips

- After completion of POST execution or the powering OFF, it may take several minutes to reach downloadable state. Please wait for a while to start download.
- The time required to reach downloadable state may vary depending on configuration or operating status of the unit.

## 2.5.2 How to Backup System Configuration

Here we describe how to backup system configuration file from the administrator PC.

1. Turn off the server or start the OS.
2. Start RESTful Interface Tool.
3. Execute login command to log in iLO of the controlled server.

Initial user name and initial password, which are required to log in, are written on a slide tag attached to the controlled server.

4. Execute types command and confirm the parameter on whose lead "BIOS" is displayed.
5. Select BIOS in select command.

As the argument of select command, specify the parameter you confirmed in step 4.

6. Execute save command to backup system configuration relating to BIOS.

If you do not specify file name, the default file name becomes "ilorest.json".

### Examples of Command Execution

```
i LOrest > login 192.168.xxx.xxx -u Administrator -p <password>
```

```
iLOrest > select Bios.v1_0_0
```

```
iLOrest > save
```

When backup is completed, the following message is displayed.

Configuration saved to : ilorest.json

#### Tips

- When you log in, use proper user account having administrator authority.
- 192.168. xxx. xxx is the IP address of management specialized LAN of controlled server.

### 2.5.3 How to Restore System Configuration

---

Here we describe how to restore system configuration file via administrator PC.

1. Turn off the server or start the OS.
2. Start RESTful Interface Tool.
3. Execute login command to log in iLO of the controlled server.

Initial user name and initial password, which are required to log in, is written on a slide tag attached to controlled server.

4. Execute types command and confirm the parameter on whose lead "Bios" is displayed.
5. Select BIOS in select command.

As the function of select command, specify the parameter you confirmed in step 4.

6. Execute load command to restore system configuration you backed up.

As the argument of select command, specify the parameter you confirmed in step 4

#### Tips

The serial number of system information and product ID are not restored.

7. When the power of device is OFF, make it ON. Or, in case OS is running, reboot.

#### Tips

Since the changes of system configuration are applied during POST, please wait until POST is completed. Then the device restarts automatically.

### 2.5.4 Notes

---

- Configurations whose backup and restore are possible are the menus under **System Utilities - System Configuration - BIOS/Platform Configuration (RBSU)** of System Utility.
- The following menus and menus under them cannot be backed up or restored.
  - **Advanced Options - Advanced Service Options - Serial Number**
  - **Advanced Options - Advanced Service Options - Product ID**
  - **Date and Time - Date (mm/dd/yyyy)**
  - **Date and Time - Time (hh:mm:ss)**
  - **Server Security - Intel(R) TXT Support**
  - **Server Security - Secure Boot Settings**
  - **Network Options - iSCSI Configurations**
  - **Storage Options - Embedded Storage Boot Policy**
  - **Storage Options - PCIe Slot Storage Boot Policy**
  - **Boot Options - UEFI Boot Settings**
  - **Boot Options - Legacy BIOS Boot Order**

- The following Information display menus cannot be backed up or restored.
  - Status
  - Version and revision of firmware
  - Serial number and product ID of system information
- You cannot restore system information you backed up to a different model.
- You cannot restore system configuration in case the System ROM version is different between the time of restoring and the time of backup.
- You cannot restore some system configurations in case there is a difference in hardware configuration between the time of back up and that of restore.
- If you restore with your OS running, restart the device in order to reflect the system configuration to it.
- Backup and restore of system configuration file may take several minutes. In case you use a remote console or remote media features of iLO and backup or restore is not completed although more than 10 minutes have passed, make these functions unable. After that, wait until the process completes.

## 3. iLO 5

### 3.1 Overview

Using iLO5, which is LSI for system management, this device has realized various features.

Regarding the details of iLO5 features, see *iLO5 User's Guide*.

iLO5 provides the following controls.

The main features of iLO	Description
Monitoring server conditions	iLO monitors a temperature inside server, controls the cooling fan, and cools down the server to the proper temperature. In addition, iLO monitors versions of firmware and software installed, the cooling fan installed to the device, memory, network, processor, power supply unit, storage, and statuses of device and others.
Agentless management	The service operates not on host OS but within iLO firmware, so you can manage without using the memory on host OS or the resources of processor. In addition to the monitoring of all the important inner sub-systems, iLO can, even if host OS is not installed, send SNMP notification directly to management software such as NEC ESM PRO Manager.
Integrated Management Log (IML)	You can display events occurred on the server and configure SNMP notification, Email alert, and notifications in Remote Syslog.
Active Health System Log (AHS Log)	Download Active Health System Log. In case the support is needed, AHS Log file may need to be sent to NEC or taken by maintenance staff.
iLO Cooperative Network Management	By using iLO Cooperative Function, you can detect and manage multiple servers at once without using management software.
Integrated Remote Console (IRC)	If network connection is established with a server, by using remote console, you can access the server speedily and safely from anywhere in the world and execute display or management.
Virtual Media	From Remote, you can mount high-performance virtual media devices on the server.
Virtual Power Control	From Remote, you can control the power state of controlled server safely.
Deployment and Provisioning	From numerous GUI and CLI for the tasks including computerizing of deployment and provisioning, you can use power control and virtual media.
Power Consumption and Power Management Setting	You can monitor power consumption and set the power limit on supported server.
User Account	By using local or directory service user account, you can log in to iLO.
Kerberos Support	You can set Kerberos authentication. <b>Zero Sign In</b> button is added to the log-in screen.

## 3.2 Comparison of License Features

By applying optional license, you can use the following features.

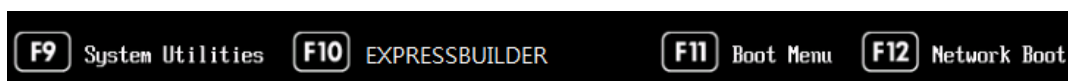
Item	On-board Functions	Remote Management Extended License (Advanced) N8115-33	Remote Management Extended License (Scale-Out) N8115-34
Directory Service Certification (Active Directory, LDAP)	×	○	×
Two-Factor Certification (Kerberos Support)	×	○	×
Virtual Media via Integrated Remote Console	×	○	×
Script Method Virtual Method	×	○	×
Integrated Remote Console (IRC)	Pre-OS only	○	Pre-OS only
Global Team Collaboration by 6 server administrators at the maximum via IRC	×	○	×
Recording and playback of video via IRC	×	○	×
Recording and playback of Virtual Serial Port	×	○	○
Remote Console of text base via SSH	×	○	○
Email alerts	×	○	○
Remote Syslog	×	○	○
Advanced Power Management (power graph, dynamic power capping) *	×	○	○
iLO Collaborative Management	×	○	○
iLO Collaborative Detection	○	○	○
Remote Serial Console (Virtual Serial Port)	○	○	○
Pre-boot Health Summary	○	○	○
iLO Reboot	○	○	○
Redfish® API	○	○	○
Agentless Management	○	○	○
Monitoring server conditions	○	○	○
Web base GUI	○	○	○
Virtual Power Control	○	○	○
SSH/SMASH CLI (Including serial console redirection)	○	○	○
IPMI/DCMI (Including serial console redirection)	○	○	○

\* Some units may not be supported.

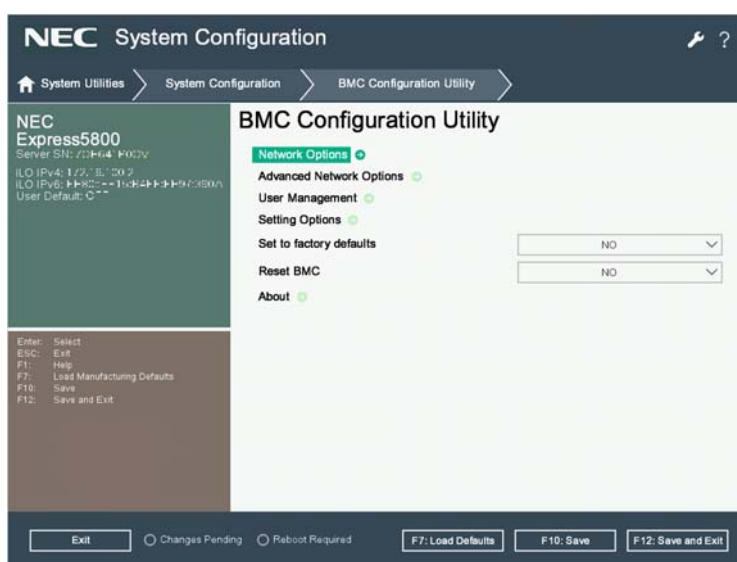
## 3.3 iLO 5 Network Settings

Followin are the examples of settings to use iLO5 form web browser.

1. Run POST following *Chapter 3 (1.1.1 POST sequence)*. After a while, the following message is displayed on the lower part of the screen.



2. Press the <F9> key while the message is being displayed to launch System Utilities.
3. From the menu of System Utilities, select **System Configuration** → **BMC Configuration Utility**.



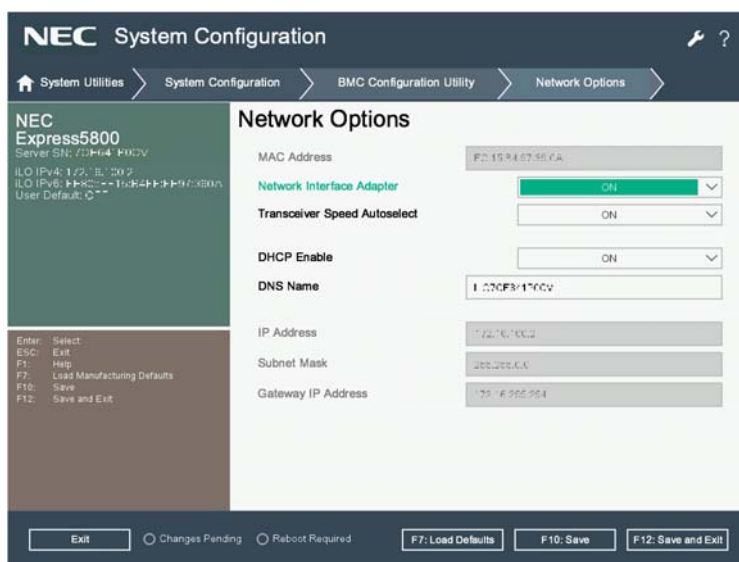
View example when **BMC Configuration Utility** is selected



- Then, on the screen on which you selected **Network Options**, use DHCP (make "DHCP Enable" **ON**) or configure items under IP Address/Subnet Mask.

**Tips**

When you configure Shared Network Port - LOM or Shared Network Port - FlexibleLOM, the network connection of iLO5 may be disconnected temporarily. In such a case, wait a while and reconnect.



View example when **Network Options** is selected

- On the next screen, use DHCP (Set DHCP item to [Enable]), or set the item under IP Address/Subnet Mask. Connect a LAN cable to a management specialized LAN connector to connect to the network. Follow the setting in Step 4. to access iLO5 from Web browser of the administrator PC. iLO5 contains default username, password, and DNS name set at the time of shipment. The default username, password, and DNS name are written on a slide tag attached to a device to which iLO is installed. Using these values and the network setting you configured in Step 4., access iLO remotely from network client with your Web browser.

The default values are as follows.

- Username: Administrator
- Password: randomly selected 8 characters including alphabets and numbers
- DNS name: BMCXXXXXXXXXXXX (12 Xs is the serial number of the server)

If you enter a wrong username or password or fail to log in, iLO imposes security delay time.

**Important** If you do not change and use default password in devices controlled via network, risk of unauthorized access by a malicious third party will increase. If your device is taken over by unauthorized access, not only data breach but also such losses as system damage due to retardation of availability or integrity, or an improper use as the means of cyber attack by botnets will become possible.

The initial password of this product is simply provided for the initial configuration for maintenance and operation. Change password without fail at the time of initial setup. If you use the initial password unchanged and then you suffer unauthorized access, we will not hold any responsibility at all.

Even if you change the initial password, less strong ones (ones including fewer figures) or easily conceivable ones (“123456789,” “abrade,” “Administrator,” etc.) are difficult to prevent unauthorized accesses. Please change to a stronger password (ones with more than 8 figures containing capital letters, small letters and numbers are recommended).

“How to change password”

1. Log in iLO 5 and then go to Administration - User Administration page.
2. Select “Administrator User” and click Edit.
3. Put the check in “Change password” and enter a new password in New Password and Confirm Password.
4. Click Update User to update.

## 4. EXPRESSBUILDER and Starter Pack

EXPRESSBUILDER and Starter Pack helps you to install Windows or maintain the server.

### 4.1 Features of EXPRESSBUILDER/Starter Pack

Feature	Description
<b>EXPRESSBUILDER</b>	
Setup (OS reinstallation)	Installs Windows or Linux on your server.
Maintenance	Configures system settings and RAID array.
<b>Starter Pack</b>	
SPP installation	Updates OS drivers and BIOS/FW by using Standard Program Package (SPP). EXPRESSBUILDER does not install SPP automatically when installing OS. SPP must be installed after installing OS.
Application installation	Installs NEC ESMPRO, RESTful Interface Tool, and other applications.
Manuals	Stores manuals for applications.

### 4.2 Usage of EXPRESSBUILDER

Run EXPRESSBUILDER by pressing <F10> key during POST when you want to configure RAID array or install OS.

For details, see *Chapter 2. (3. Details of EXPRESSBUILDER) of Maintenance Guide.*

### 4.3 Usage of Starter Pack

Starter Pack includes OS driver, application, and other software.

Starter Pack is provided as an optional product and on the following web site.

<http://www.nec.com/express/>

(Download - Documents & Software - Select Model)

For details, see *Chapter 2. (4. Details of Starter Pack) of Maintenance Guide.*

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## **5. Installing Software Components**

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Continue to install software components such as OS.

See the instructions below.

- Installation Guide (Windows)

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## 6. Turning Off the Server

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Turn off the server by using the following procedure. If the power cord of the server is connected to a UPS, refer to the documentation supplied with the UPS or the documentation for the application controlling the UPS.

1. Shut down the OS.
2. The server automatically turns off after the OS shuts down.  
Confirm that POWER LED is amber.
3. Turn off peripheral devices.

In the upgrading or maintenance procedure, back up the important server data and programs before shutting down the server.

**Important** Auxiliary power will continue to be supplied to the system, even if the server is in standby mode.

When shutting down the server, use one of the following methods.

- Press and release the POWER switch.  
This method shuts down applications and OS in the correct order before the server enters standby mode.
- Press and hold the POWER switch for 4 seconds or more to force the server to enter standby mode.  
This method forces the server to enter standby mode without shutting down applications and OS in the correct order. If the application stops responding, this method can be used to force it to shut down.
- Use the virtual POWER switch via the iLO 5.  
This method remotely shuts down applications and OS in the correct order before the server enters standby mode.

Before continuing with the procedure, make sure that the server is in standby mode (POWER LED in amber color).

## **NEC Express5800 Series Express5800/R120h-2M**

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# **4**

## **Appendix**

- 1. Specifications**
- 2. Glossary**
- 3. Revision Record**

# 1. Specifications

Part Number		N8100-2562F	N8100-2563F	N8100-2564F	N8100-2565F		
CPU	On-board CPU, operation frequency Number of cores (C)/ threads (T) (1CPU) Intel Smart Cache (Last level cache)	See the attached file    “On-board CPU”					
	Number of standard installation/ maximum installation	0/2					
Chipset		Intel® C621 Chipset					
Memory	On-board capacity standard/ maximum	Not included in Standard Installation/ (Option) Registered DIMM: 768GB (24x 32GB), Load Reduced DIMM: 3.0TB (24x 128GB)					
	On-board Memory	DDR4-2666 Registered DIMM (8/16/32GB), DDR4-2666 Load Reduced DIMM (64/128GB)					
	Maximum operation frequency	2666MHz (See <i>System Configuration Guide</i> regarding the maximum operation frequency of each CPU)					
	Error Detection and Correction	ECC, x4 SDDC					
	Memory sparing	Capable					
	Memory mirroring	Capable					
Secondary memory device	Drive bay	Built-in slot	Front	8x2.5 inch drive (BOX3 standard) 8x2.5 inch additional drive (option, up to two, BOX1/2) Or 8x2.5 inch additional drive (option x1 BOX2) + 2x2.5 type additional drive (option x1 BOX1)	24x2.5 inch drive	8x3.5 inch drive (BOX2/3 standard) 2x2.5 inch additional drive (option up to 1 BOX1)	12x3.5 inch drive
			Rear	2x2.5 inch drives (option, up to three)		2 x 2.5 inch drives (up to three options), or 2 x 2.5 inch drive (option 1) +3 x 3.5 drives (option 1)	
			Internal parts	—		4x3.5 inch additional drive (optional up to 1)	
				2x M.2 SATA slots			
		Built-in standard	—				
		Maximum built-in	2.5 inch HDD: SATA 56TB (28x 2TB), SAS 50.4TB (28x 1.8TB) 2.5 inch SSD: SATA 107.52TB (28x 3.84TB), SAS 26.88TB (28x 960GB) 2.5 inch SSD: PCIe 32TB (20x 1.6TB) (When an optional HDD cage is added)	2.5 inch HDD: SATA 60TB (30x2TB), SAS 54TB (30x1.8TB) 2.5 inch SSD: SATA 115.2TB (30x 3.84TB), SAS 28.8TB (30x 960GB) (When an optional HDD cage is added)	3.5 inch HDD : SATA 150TB (15x10TB) 2.5 inch HDD : SATA 16TB (8x2TB), but must be 3.5HDDx 12, SAS 14.4TB (8x1.8TB) 2.5 inch SSD : SATA 30.72TB (8x 3.84TB), SAS 7.68TB (8x 960GB) 2.5 inch PCIe SSD : PCIe 3.2TB (2x 1.6TB) (When an optional HDD cage is added)	3.5 inch HDD : SATA190TB (19x10TB) 2.5 inch HDD : SATA 12TB (6x2TB), but must be 3.5HDDx16, SAS 10.8TB (6x1.8TB) 2.5 inch SSD : SATA 23.04TB (6x 3.84TB), SAS 5.76TB (6x 960GB) (When an optional HDD cage is added)	
			Hot-swap				Capable
			Interface specification and RAID configuration		SATA 6Gb/s : RAID 0/1/5/6/10/50/60 (Option), SAS 12Gb/s : RAID 0/1/5/6/10/50/60 (Option)		
	Optical disk drive		Connection of built-in/ external drive (Option) *1				
	FDD		Option: flash FDD(1.44MB) *2				
	Expansion bay		—				
	Expansion	Corresponding Slots	Standard configuration 1x PCI Express 3.0 (x16 lanes, x16 sockets) (full-height, half-length/Slots2) 2x PCI Express 3.0 (x8 lanes, x8 sockets) (full-height, full-length/slot 1, half-length/slot 3) 1x PCI Express 3.0 (x8 lanes, x8 sockets) (dedicated for RAID controller) 1x PCI Express 3.0 (x8 lanes, x8 sockets) (exclusive use for LOM card) (You can change PCI configuration by preparing optional raiser cards. See the system configuration guide for the detailed information. )				
	Graphics	Built-in chips/ video RAM	Internal management controller chip/ 16MB				
		Graphics and resolution	1677 million colors: 640x480, 800x600, 1,024x768, 1,280x1,024, 1,600x1,200, 1,920x1,200				

Part Number		N8100-2562F	N8100-2563F	N8100-2564F	N8100-2565F
Standard interface	Front	<u>Standard specification</u> 1xUSB3.0(Type A), 1xUSB2.0(Type A) (iLO service port) <u>Options</u> 1xUSB3.0(Type A), 1xStatus LED Panel (Systems Insight Display), 1xDisplayport, 2xUSB2.0(Type A)	<u>Standard specification</u> 1xUSB3.0(Type A), 1xUSB2.0(Type A) (iLO service port) <u>Options</u> 1xUSB3.0(Type A), 1xStatus LED Panel (Systems Insight Display)	<u>Standard specification</u> 1xUSB3.0(Type A), 1xUSB2.0(Type A) (iLO service port), 1x Displayport	—
	Rear	2x USB3.0 (TypeA), 1x Analog RGB (Mini D-Sub pin), 1x Management Dedicated LAN Connector (Compatible with 1000BASE-T/100BASE-TX/10BASE-T, RJ-45) 4x Data LAN Connector (Compatible with 1000BASE-T/100BASE-TX/10BASE-T (RJ-45)) 1x Serial Port (Option)			
	Internal parts	2x USB3.0 (TypeA), 2x(4x SATA 2.0 ports), 1x(2x SATA 2.0 ports)			
Redundant power supplies		Capable (Optional, hot plug-able)			
Redundant fans		Capable (Standard specification, hot plug-able)			
Dimensions (Width x depth x height)		434.6mm x 707.0mm x 42.9mm (Front bezel/ rails /protuberances not included)		434.6mm x 749.8mm x 42.9mm (Front bezel/ rails/ protuberances not included)	
Mass (Minimum*3 / maximum)		15kg /38kg	15kg /39kg	15kg/45kg	15kg/46kg
Power source		<u>AC Power Unit (N8181-159, 160)</u> 500W/800W 80 PLUS® Platinum power supply unit (Outlet with two pole parallel earth) (Hot plug-able) (Max: 2) AC100-120V/200-240V±10%, 50/60Hz±3Hz (Power cable type needs to be selected) <u>AC Power Unit (N8181-161)</u> 800W 80 PLUS® Titanium power supply unit (Outlet with two pole parallel earth) (Hot plug-able) (Max: 2) AC200-240V±10%, 50/60Hz±3Hz (Power cable type needs to be selected) <u>AC Power Unit (N8181-162)</u> 1600W 80 PLUS® Platinum power supply unit (Outlet with two pole parallel earth) (Hot plug-able) (Max: 2) AC200-240V±10%, 50/60Hz±3Hz (Power cable type needs to be selected) <u>DC Power Unit (N8181-163)</u> 800 W DC-48v power (Outlet with two pole parallel earth) (Hot plug-able) (Maximum: 2) (Power cable type needs to be selected) <u>DC Power Unit (N8181-164)</u> 800W 380VDC power (Outlet with two pole parallel earth) (Hot plug-able) (Maximum: 2) (Power cable type needs to be selected)			
Temperature/ humidity conditions		During operation: 10~35°C/8~90%, In storage: -30~60°C/5~95%(both during operation and in storage, avoid condensation)			
Chief accessories		Getting Started, Safety Precautions and Regulatory Notices, front bezel			
Install OS		—			
OS supported	NEC support	Microsoft® Windows Server® 2012 R2 Standard, Microsoft® Windows Server® 2012 R2 Datacenter, Microsoft® Windows Server® 2016 Standard, Microsoft® Windows Server® 2016 Datacenter, Red Hat® Enterprise Linux® 7.3 or later *4, VMware ESXi™ 6.0 Update3, VMware ESXi™ 6.5 Update1			
Operation Check OS		Regarding the latest operational information, refer to our information sight <i>Linux on Express 5800</i>			

\*1 If you do not install an on-board DVD-ROM or on-board DVD SuperMULTI, please purchase an optional external DVD-ROM for the maintenance and the reinstall of OS.

\*2 Please purchase as necessary. Regarding the main use, refer to the follow-up notes on Flash FDD in the system configuration guide.

\*3 Operable minimum constitution (1x CPU, 1x DIMM, 1x HDD, 1x power unit)

\*4 If you need to receive the customer support, please purchase Linux Service Pack (The contents of support differ according to the major versions).



**On-board CPU**

On-boardCPU,	Intel® Xeon® Processor Scalable Family
Operation Frequency	Xeon Bronze 3104 Processor (1.70 GHz, 6C/6T, 8.25MB, TDP 85W) *1,
Number of	Xeon Bronze 3106 Processor (1.70 GHz, 8C/8T, 11MB, TDP 85W) *1,
cores(C)/Threads(T)	Xeon Silver 4108 Processor (1.80 GHz, 8C/16T, 11MB, TDP 85W),
(1CPU)	Xeon Silver 4110 Processor (2.10 GHz, 8C/16T, 11MB, TDP 85W),
Intel Smart Cache(Lat	Xeon Silver 4112 Processor (2.60 GHz, 4C/8T, 8.25MB, TDP 85W),
Level Cache)MB	Xeon Silver 4114 Processor (2.20 GHz, 10C/20T, 13.75MB, TDP 85W),
<b>TDP</b> (Thermal Disign	Xeon Silver 4116 Processor (2.10 GHz, 12C/24T, 16.50MB, TDP 85W),
Power) Maximum heat	Xeon Gold 5115 Processor (2.40 GHz, 10C/20T, 13.75MB, TDP 85W),
radiationW	Xeon Gold 5118 Processor (2.30 GHz, 12C/24T, 16.50MB, TDP 105W),
	Xeon Gold 5120 Processor (2.20 GHz, 14C/28T, 19.25MB, TDP 105W),
	Xeon Gold 5122 Processor (3.60 GHz, 4C/8T, 16.50MB, TDP 105W),
	Xeon Gold 6126 Processor (2.60 GHz, 12C/24T, 19.25MB, TDP 125W),
	Xeon Gold 6128 Processor (3.40 GHz, 6C/12T, 19.25MB, TDP 115W),
	Xeon Gold 6130 Processor (2.10 GHz, 16C/32T, 22MB, TDP 125W),
	Xeon Gold 6132 Processor (2.60 GHz, 14C/28T, 19.25MB, TDP 140W),
	Xeon Gold 6134 Processor (3.20 GHz, 8C/16T, 24.75MB, TDP 130W),
	Xeon Gold 6136 Processor (3 GHz, 12C/24T, 24.75MB, TDP 150W),
	Xeon Gold 6138 Processor (2GHz, 20C/40T, 27.50MB, TDP 125W),
	Xeon Gold 6140 Processor (2.30 GHz, 18C/36T, 24.75MB, TDP 140W),
	Xeon Gold 6142 Processor (2.60 GHz, 16C/32T, 22MB, TDP 150W),
	Xeon Gold 6144 Processor (3.50 GHz, 8C/16T, 24.75MB, TDP 150W),
	Xeon Gold 6146 Processor (3.20 GHz, 12C/24T, 24.75MB, TDP 165W),
	Xeon Gold 6148 Processor (2.40 GHz, 20C/40T, 27.50MB, TDP 150W),
	Xeon Gold 6150 Processor (2.70 GHz, 18C/36T, 24.75MB, TDP 165W),
	Xeon Gold 6152 Processor (2.10 GHz, 22C/44T, 30.25MB, TDP 140W),
	Xeon Gold 6154 Processor (3GHz, 18C/36T, 24.75MB, TDP 200W),
	Xeon Platinum 8153 Processor (2 GHz, 16C/32T, 22MB, TDP 125W),
	Xeon Platinum 8156 Processor (3.60 GHz, 4C/8T, 16.50MB, TDP 105W),
	Xeon Platinum 8158 Processor (3GHz, 12C/24T, 24.75MB, TDP 150W),
	Xeon Platinum 8160 Processor (2.10 GHz, 24C/48T, 33MB, TDP 150W),
	Xeon Platinum 8164 Processor (2GHz, 26C/52T, 35.75MB, TDP 150W),
	Xeon Platinum 8168 Processor (2.70 GHz, 24C/48T, 33MB, TDP 205W),
	Xeon Platinum 8170 Processor (2.10 GHz, 26C/52T, 35.75MB, TDP 165W),
	Xeon Platinum 8176 Processor (2.10 GHz, 28C/56T, 38.50MB, TDP 165W),
	Xeon Platinum 8180 Processor (2.50 GHz, 28C/56T, 38.50MB, TDP 205W),
	Xeon Gold 6134M Processor (3.20 GHz, 8C/16T, 24.75MB, TDP 130W),
	Xeon Gold 6140M Processor (2.30 GHz, 18C/36T, 24.75MB, TDP 140W),
	Xeon Gold 6142M Processor (2.60 GHz, 16C/32T, 22MB, TDP 150W),
	Xeon Platinum 8160M Processor (2.10 GHz, 24C/48T, 33MB, TDP 150W),
	Xeon Platinum 8170M Processor (2.10 GHz, 26C/52T, 35.75MB, TDP 165W),
	Xeon Platinum 8176M Processor (2.10 GHz, 28C/56T, 38.50MB, TDP 165W),
	Xeon Platinum 8180M Processor (2.50 GHz, 28C/56T, 38.50MB, TDP 205W)

\*1: These CPUs will not be supported and shipped to Taiwan clients.

## 2. Glossary

Terms	Description
AHS	Active Health System (AHS) monitors the status/configuration of the server, and records it to a log file if any changes occur. AHS log is used for maintenance to investigate the failure.
AMP	Advanced Memory Protection (AMP) is a technology for realizing a fault tolerance of the server by memory redundancy (such as mirroring).
AMS	Agentless Management Service (AMS) is an OS service for sending information (such as OS events) that iLO cannot collect directly. iLO records the information received by AMS, and send it to Agentless Management.
EXPRESSBUILDER	Software for setting up the server. EXPRESSBUILDER can be started by pressing <F10> key during POST.
Express Report Service	Software that can report the server failure to the contact center by E-mail or modem. This software is installed with NEC ESMPRO ServerAgentService to the server.
Express Report Service (HTTPS)	Software that can report the server failure to the contact center by HTTPS. This software is installed with NEC ESMPRO ServerAgentService to the server.
Hexalobular	A type of screw head characterized by a 6-point star-shaped pattern. This is often called as "Torx" (the Torx is a third party's trademark). Head sizes are described from T1 to T100. This is sometimes abbreviated as 6lobe.
iLO	A built-in controller that supports the IPMI version 2.0 protocol. The controller is called as iLO5 because this server adopts a generation 5 version controller.
NEC ESMPRO ServerAgentService	Software for monitoring the server. This works with NEC ESMPRO Manager. You can choose Service Mode or Non-Service Mode when installing this software. Service Mode resides as the OS service and Non-Service Mode does not use the OS service to reduce memory, CPU power, and other OS resources.
NEC ESMPRO Manager	Software for managing a number of servers on network.
PC for Management	A computer for managing the server on network. A general Windows/Linux computer can be used as "PC for Management".
Product Info Collection Utility	Software for collecting several hardware/software statuses and event logs. You can easily collect the data for the server maintenance by using this software.
RAID Report Service	This service monitors the RAID status and notifies failures.
RBSU	ROM-Based Setup Utility (RBSU) is a built-in utility that can configure connected devices and BIOS settings. RBSU is called from System Utilities.
RESTful Interface Tool	A tool that supports API based on Representational State Transfer (REST) architecture. You can send maintenance commands in JSON format to iLO by HTTP protocol after installing this tool.
SID	System Insight Display (SID) is an optional product that can indicate the statuses of each device on motherboard.

Terms	Description
SPP	Standard Program Package (SPP) is a software package that includes BIOS, FW, driver, and other basic software. SPP is included in Starter Pack.
SSA	Smart Storage Administrator (SSA) is a utility that can configure RAID arrays. SSA is provided for Windows/Linux and can also start from F10 key function.
Starter Pack	A software package that includes SPP, instruction manual, application, and other software for the server. This must be installed before using OS on the server. Starter Pack is provided as an optional product and ISO data on our website.
System Maintenance Switch	A DIP switch on motherboard. This switch can enable/disable initialization, password, iLO settings, and other functions of maintenance.
System Utilities	System Utilities is a built-in utility that provides system information, calling RBSU, collecting system log, and other system utilities. You can start System Utilities by F9 key during POST.
TPM Kit	An optional product of Trusted Platform Module for the server.

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## 3. Revision Record

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Document Number	Date Issued	Description
10.201.02-101.01	August 2017	Newly created
10.201.02-101.02	November 2017	Memory have been added. PCIe SSD has been supported.
10.201.02-101.03	April 2018	The following were modified. 1.7 TPM Kit N8115-35 1.8 Processor (CPU) 1.10 High-performance CPU heat sink module N8101-1286, 1U heat sink HS
10.201.02-101.03	July 2018	PCIe SSD has been modified.

NEC Express Server

Express5800/R120h-2M

User's Guide

July 2018

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