NEC Express Server
Express5800 Series

Express5800/T120h
EXP806
TPS-I006

10.202.01-101.01
April 2018

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. **Read these cautions before using this server.**
Getting Started	Describes how to use this server, from unpacking to operations. See this guide first and read the outline of this product.
Electronic manuals in the Starter Pack DVD or on the website (http://www.nec.com/)	
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 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	

Contents

Conventions Used in This Document

Signs and symbols for safety

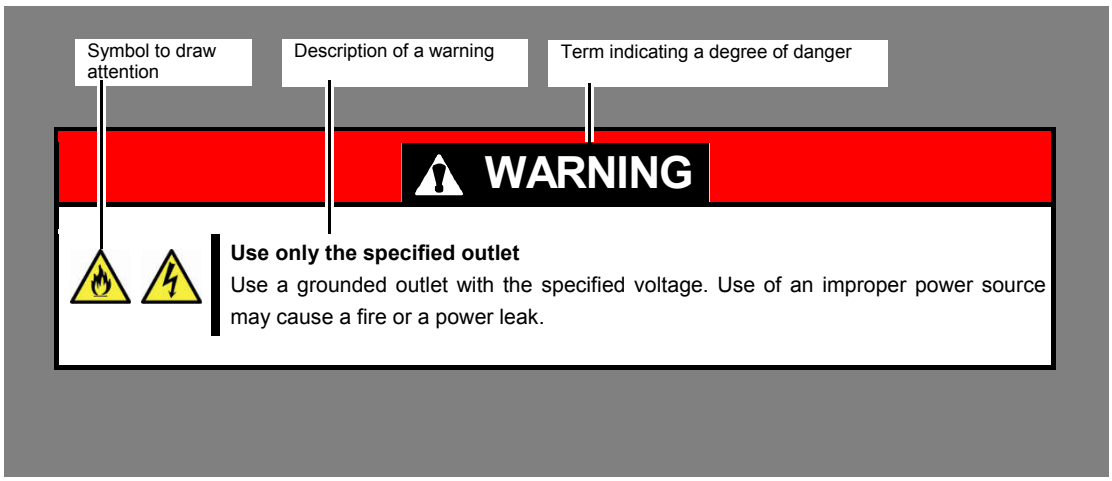
WARNING and **CAUTION** are used in this guide as following meaning.

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:

	**Attention**	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)
	**Prohibited Action**	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action.	(Example)  (Do not disassemble)
	**Mandatory Action**	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard.	(Example)  (Disconnect a plug)

(Example in this guide)



Notations used in the text

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

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

Optical disk drive

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**

Hard disk drive

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)

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

POST

POST described in this manual refers to the following.

- **Power On Self-Test**

BMC

BMC described in this manual refers to the following.

- Baseboard Management Controller

The device employs iLO5 as a BMC.

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Latest editions

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.

http://www.nec.com/express/

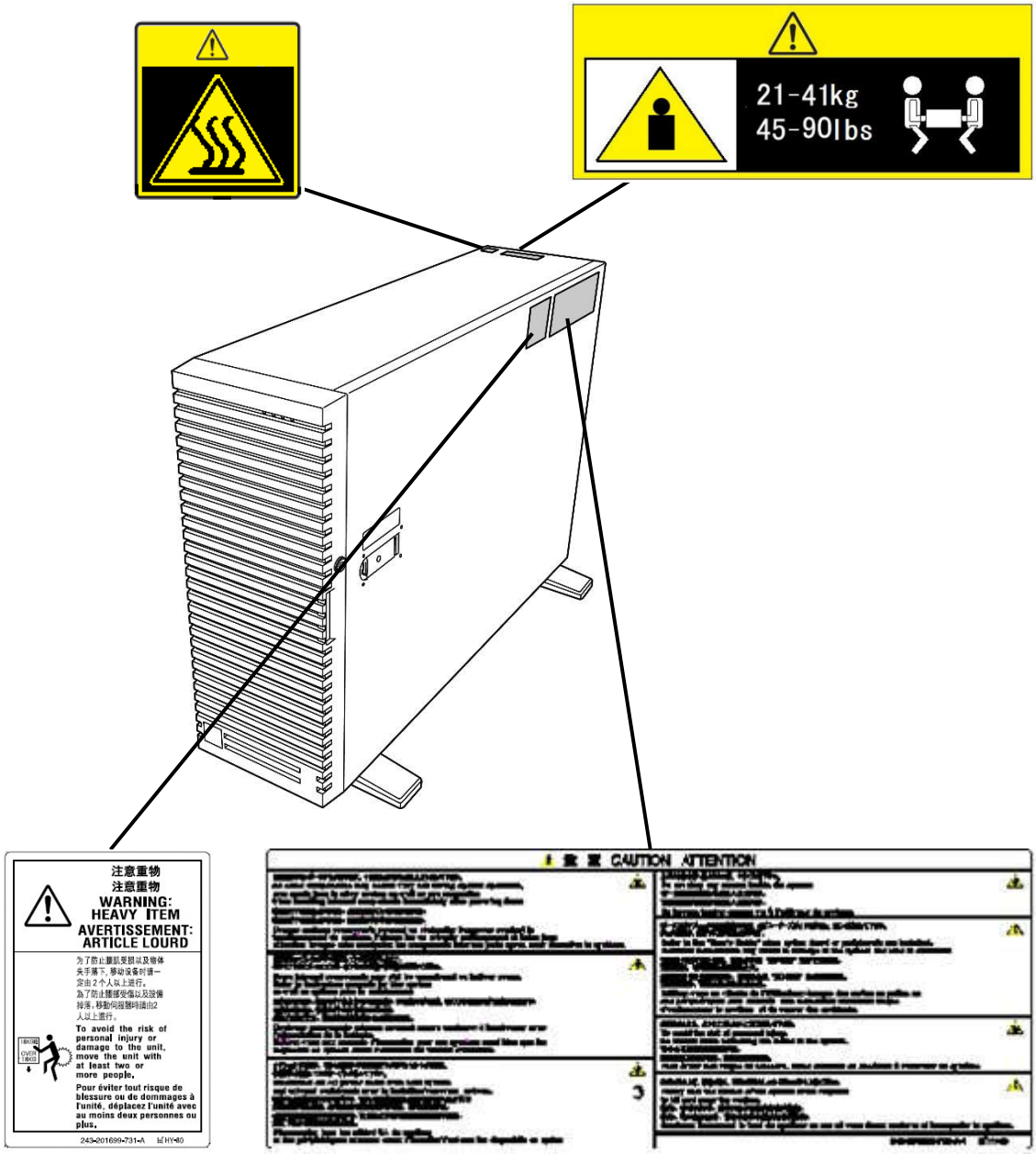
Safety notes

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.


21-41kg
45-90lbs
注意重物
注意重物
WARNING:
HEAVY ITEM
AVERTISSEMENT:
ARTICLE LOURD
To avoid the risk of personal injury or damage to the unit, move the unit with at least two or more people.
Pour éviter tout risque de blessure ou de dommages à l'unité, déplacez l'unité avec au moins deux personnes ou plus.
CAUTION ATTENTION

Handling precautions (for proper operations)

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 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
- 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.

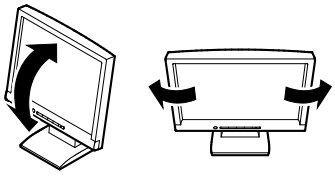
Keep proper posture

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.

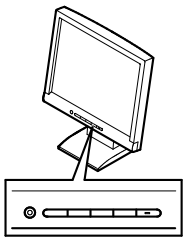
Adjust the angle of your display

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.



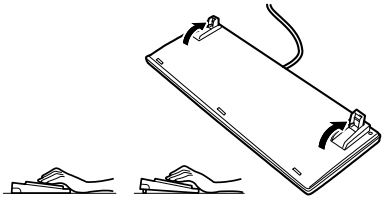
Adjust the brightness and contrast of the display

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.

NEC Express5800 Series
Express5800/T120h

1

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.

- Server
- Bezel lock key (attached to the device)
- Safety Precautions and Regulatory Notices
- Getting Started

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

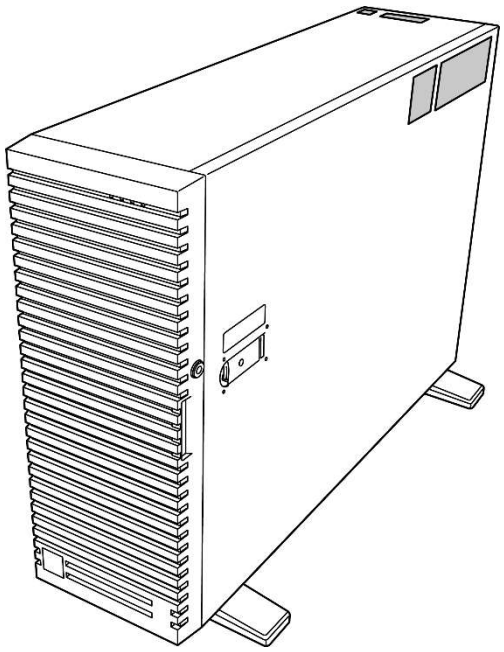
- Operating system or application software
- Hardware options
- Drivers (Hexalobular standard, etc.)

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 (1.70GHz 6Core)*8
  - Xeon Bronze 3106 Processor (1.70GHz 8Core)*8
  - Xeon Silver 4108 Processor (1.80GHz 8Core)*8
  - Xeon Silver 4110 Processor (2.10GHz 8Core)*8
  - Xeon Silver 4112 Processor (2.60GHz 4Core)*8
  - Xeon Silver 4114 Processor (2.20GHz 10Core)
  - Xeon Silver 4116 Processor (2.10GHz 12Core)*8
  - Xeon Gold 5115 Processor (2.40GHz 10Core)
  - Xeon Gold 5118 Processor (2.30GHz 12Core)*8
  - Xeon Gold 5120 Processor (2.20GHz 14Core)*8
  - Xeon Gold 5122 Processor (3.60GHz 4Core)
  - Xeon Gold 6126 Processor (2.60GHz 12Core)*8
  - Xeon Gold 6128 Processor (3.40GHz 6Core)
  - Xeon Gold 6130 Processor (2.10GHz 16Core)*8
  - Xeon Gold 6132 Processor (2.60GHz 14Core)
  - Xeon Gold 6134 Processor (3.20GHz 8Core)*8
  - Xeon Gold 6136 Processor (3.00GHz 12Core)
  - Xeon Gold 6138 Processor (2.00GHz 20Core)*8
  - Xeon Gold 6140 Processor (2.30GHz 18Core)*8
  - Xeon Gold 6142 Processor (2.60GHz 16Core)
  - Xeon Gold 6144 Processor (3.50GHz 8Core)

  - Xeon Gold 6146 Processor (3.20GHz 12Core)
  - Xeon Gold 6148 Processor (2.40GHz 20Core)
  - Xeon Gold 6150 Processor (2.70GHz 18Core)*8
  - Xeon Gold 6152 Processor (2.10GHz 22Core)
  - Xeon Gold 6154 Processor (3.00GHz 18Core)
  - Xeon Platinum 8153 Processor (2.00GHz 16Core)*8
  - Xeon Platinum 8156 Processor (3.60GHz 4Core)*8
  - Xeon Platinum 8158 Processor (3.00GHz 12Core)*8
  - Xeon Platinum 8160 Processor (2.10GHz 24Core)*8
  - Xeon Platinum 8164 Processor (2.00GHz 26Core)*8
  - Xeon Platinum 8168 Processor (2.70GHz 24Core)
  - Xeon Platinum 8170 Processor (2.10GHz 26Core)
  - Xeon Platinum 8176 Processor (2.10GHz 28Core)*8
  - Xeon Platinum 8180 Processor (2.50GHz 28Core)
  - Xeon Gold 6134M Processor (3.20GHz 8Core)
  - Xeon Gold 6140M Processor (2.30GHz 18Core)*8
  - Xeon Gold 6142M Processor (2.60GHz 16Core)*8
  - Xeon Platinum 8160M Processor (2.10GHz 24Core)*8
  - Xeon Platinum 8170M Processor (2.10GHz 26Core)*8
  - Xeon Platinum 8176M Processor (2.10GHz 28Core)*8
  - Xeon Platinum 8180M Processor (2.50GHz 28Core)*8
- 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 1000BASE-T interface

High reliability

- Processor throttle-ring feature
- Memory monitoring feature (error correction/error detection)
- Memory degradation feature (logically cuts off a device when a failure occurs)
- Memory x4 SDDC/ Memory ADDDC feature (may be used on a some of memories)
- Memory mirroring, memory sparing features
- Memory throttle-ring feature
- Bus parity error detection
- Temperature detection
- Error detection
- Internal fan 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 feature (provided optionally)
- Fan (hot swapping supported)
- HDD (hot swapping supported)

Management Utilities

- NEC ESMPRO
- Remote controlling feature (iLO 5)
- 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
  - 2x PCIe 3.0(x16) + 2x PCIe 3.0(x4, mechanically x8) (CPU1)
  - 2x PCIe 3.0(x16) + 2x PCIe 3.0(x8) (CPU2)
  - PCI Express 3.0 (x8 lanes): 1 slot (dedicated to RAID controller)
- Large capacity memory of up to 1.5TB *6
- Can upgrade to multi-processor system with up to two processors
- Expansion Bay (for hard disk drives): up to 24 slots
- Optical disk drive bay provided as an option
- USB3.0 interface (Front: 2 port, rear: 2 ports, internal: 1 ports)
- USB2.0 interface (Internal: 1 port)
- Management LAN port (1 port)

Ready to use

- No cable connection is required to install a hard disk drive and additional power supply unit (hot swap supported).

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
- Power switch mask
- 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

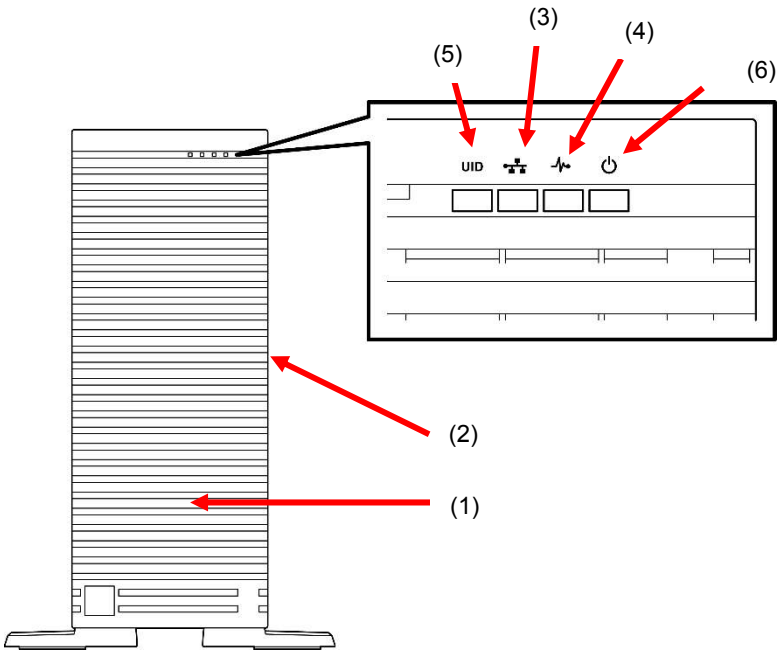
*7: Power supply unit N8181-161 acquired 80 PLUS® Titanium.
Power supply units N8181-159/160/162 acquired 80 PLUS®Platinum.

*8: These CPUs will not be supported and shipped to Taiwan clients.

4. Names and Functions of Parts

This section describes the names of the server parts.

4.1 Front View



(1) Front Bezel
Cover to protect the front side. Possible to lock with the attached bezel lock key.

(2) Key Slot
Keyhole of a key to lock the front bezel.

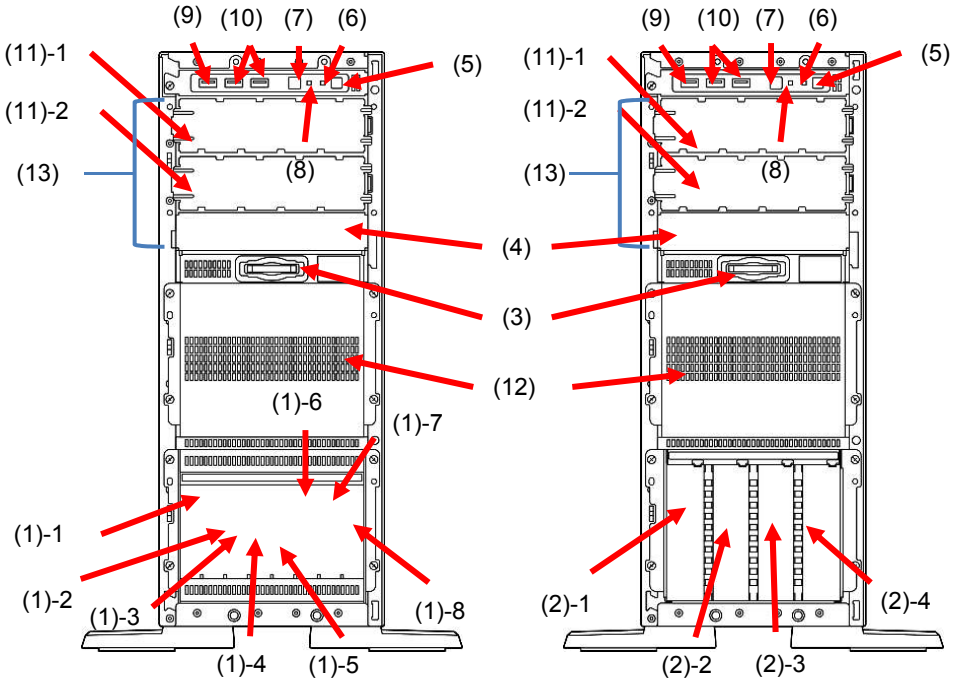
(3) LAN LINK/ACT LED
Indicates the status of the network connections.

(4) STATUS LED
Indicates the status of the server.

(5) UID(Unit ID) Switch/LED
Indicates the ON/OFF status of the unit ID light.

(6) POWER Switch/LED
Indicates the power status of the server.

4.2 Front View (Without Front Bezel)



(1) 2.5-inch Drive Bay
A drive bay for adding a hard disk drive.
The last number represents a slot number.
By default, dummy trays are installed in all empty slots.
(Box 3 and HDD cage are included as standard equipment)

(2) 3.5-inch Drive Bay
A drive bay for adding a hard disk drive.
The last number represents a slot number.
By default, dummy trays are installed in all empty slots.
(Box 3 and HDD cage are included as standard equipment)

(3) Pull-Out Tag
A tag for showing the model number and serial number of the server.

(4) Optical Disk Drive Bay (Optional)
Attach the optical disk drive.
In accordance with the order specified at the time of purchase, any of the following optional drives are installed.

- DVD-ROM drive
- DVD Super MULTI drive

(5) POWER Switch/LED
A switch to turn the power ON/OFF. If pressed once, the POWER light illuminates, and it turns to ON. Press it again to turn the power OFF.
Depressing for 4 seconds or more will forcibly turn the power OFF.

(6) STATUS LED
LEDs for showing the server status.

(7) UID (Unit ID) Switch/LED
A switch to turn the unit ID light to ON/OFF and to restart iLO.
If pressed once, the UID light illuminates, and it turns to ON. Press it again to turn it to OFF.
For instructions on restarting iLO using the UID switch, refer to the iLO 5 User's Guide.
While executing commands from software, remote control of iLO or firmware update, the UID light illuminates or blinks if iLO is restarted with the UID switch.

(8) LAN LINK/ACT LED
Indicates the status of the network connections.

(9) iLO Service Port USB Connector
A USB connector used for connecting to iLO to perform operations such as acquiring logs. For details, refer to the iLO 5 User's Guide.

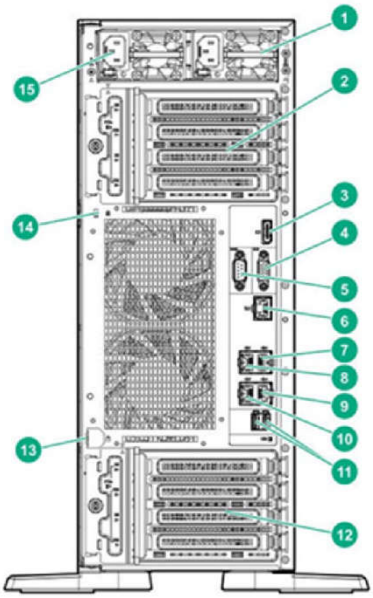
(10) USB 3.0 Connector (Front)
Connect to a USB 3.0 interface-compatible device.

(11) Media Bay
-1 Compatible with built-in LTO (N8151-141/142/143) or built-in RDX (N8151-139)
-2 Only compatible with built-in RDX (N8151-139)

(12) Drive Expansion Bay
(Option: Box 2)
3.5-inch drive models are compatible with 3.5 HDD cages (N8154-108)
2.5-inch drive models are compatible with 2.5 HDD cages (N8154-109)

(13) Drive Expansion Bay
(Option: Box1)
3.5-inch drive models are compatible with 3.5 HDD cages (N8154-108)
2.5-inch drive models are compatible with 2.5 HDD cages (N8154-109)
To install into Box 1, please remove (4), (11)-1 and (11)-2.

4.3 Rear View



(1) Power supply unit 1 (power supply slot 1)
(Mandatory option) DC power is supplied to the device.

(2) PCIe slot 5～8
A slot for installing the PCIe card. Slot numbers are named as Slot 5, 6, 7, and 8 from bottom toward top.

(3) DisplayPort
DisplayPort operation is confirmed by the N8005-1007 DP-VGA conversion connector, however, please try to perform a full verification before use.

(4) VGA port

(5) Serial port(COM)
Connect to a device equipped with a serial interface. Not available for connecting directly to a dedicated line.

(6) Management LAN connector
A connector compatible with 1000BASE-T/100BASE-TX/10BASE-T.
Cannot be used as a regular LAN.
Used only for connection with iLO.

(7) LAN connector 2
A connector compatible with 1000BASE-T.

(8) LAN connector 1

(9) LAN connector 4

(10) LAN connector 3

(11) USB3.0 connector 2
Connect to a USB 3.0 interface-compatible device.

(12) PCIe slot 1～4
A slot for installing the PCIe card. Slot numbers are named as Slot 1, 2, 3, and 4 from bottom toward top.

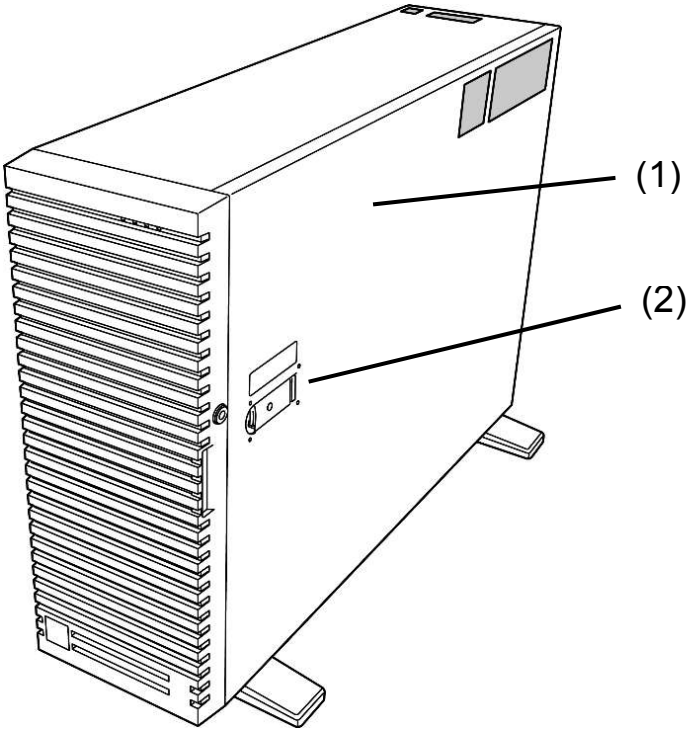
(13) Padlock eye

(14) Kensington security slot

(15) Power supply unit2
(Mandatory option) DC power is supplied to the device.

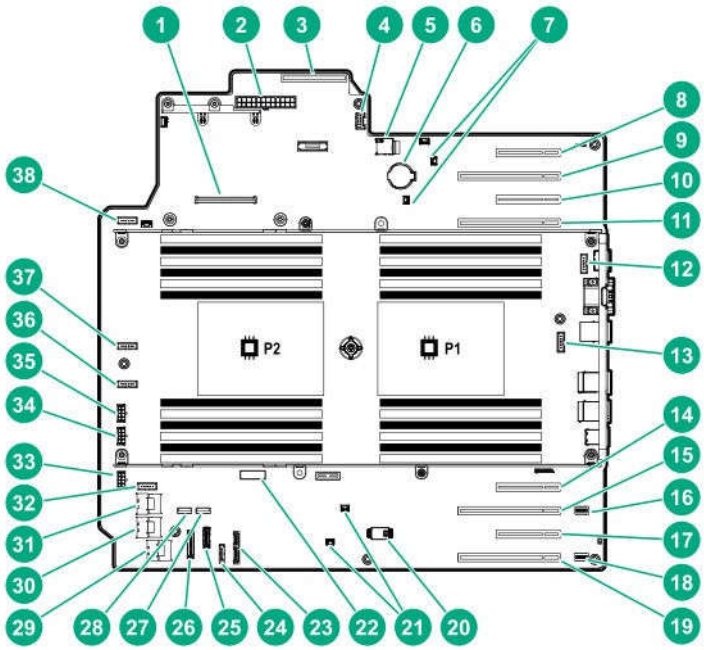
*1 To use PCIe Slots 5-8, adding a second processor is necessary.

4.4 External View



(1) Side cover
(2) Hood latch

4.5 Motherboard



(1) Dedicated slot for RAID controller PCI board
(2) Connector for non-redundant power supply unit
(3) Connector for power supply back panel
(4) Battery connector for RAID controller
(5) Unused connector
(6) Lithium battery
(7) Unused connector
(8) x8 PCIe slot 8
(9) x16 PCIe slot 7
(10) x8 PCIe slot 6
(11) x16 PCIe slot 5
(12) Fan connector 5
(13) Fan connector 6
(14) x8 PCIe slot 4
(15) x16 PCIe slot 3
(16) A connector for NVMe riser card sideband signals (PCIe slot 3)
(17) x8 PCIe slot 2
(18) NVMe riser card connector for sideband signal(PCIe slot 1)
(19) x16 PCIe slot 1
(20) Connector for TPM kit
(21) Unused connector
(22) System maintenance switch
(23) SATA port 5 connector
(24) SATA port 4 connector
(25) Cable connector for front USB
(26) Cable connector for front LED/button
(27) Internal USB 2.0 connector
(28) Internal USB 3.0 connector
(29) SATA port 2 connector
(30) SATA port 1 connector
(31) SATA port 3 connector
(32) Fan connector 4
(33) Power connector for Box 3 drive
(34) Power connector for Box 2 drive
(35) Power connector for Box 1 drive
(36) Fan connector 3
(37) Fan connector 2
(38) Fan connector 1

4.5.1 System Maintenance Switch

Detailed features of system maintenance switch

Position	Default	Setting	Description
SW1 *1 *5	OFF	OFF	Set to OFF usually.
		ON	Set the security of iLO5 to disabled.
SW2	OFF	Reserved	—
SW3	OFF	Reserved	—
SW4	OFF	Reserved	—
SW5 *2 *5	OFF	OFF	Set to OFF usually.
		ON	Clear power-on password and administrator password.
SW6 *3 *5	OFF	OFF	Set to OFF usually.
		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 device to fail or malfunction.**

*1 Set SW1 to ON when all the passwords of iLO5 to which administrator authority is given have become unknown, or when changing the feature of iLO5 from disabled to enabled.

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

*3 Regarding the operation procedure of SW6, see *Chapter 1 (7.3.3 Restore the Default Settings of System Configuration)* in *Maintenance Guide*.

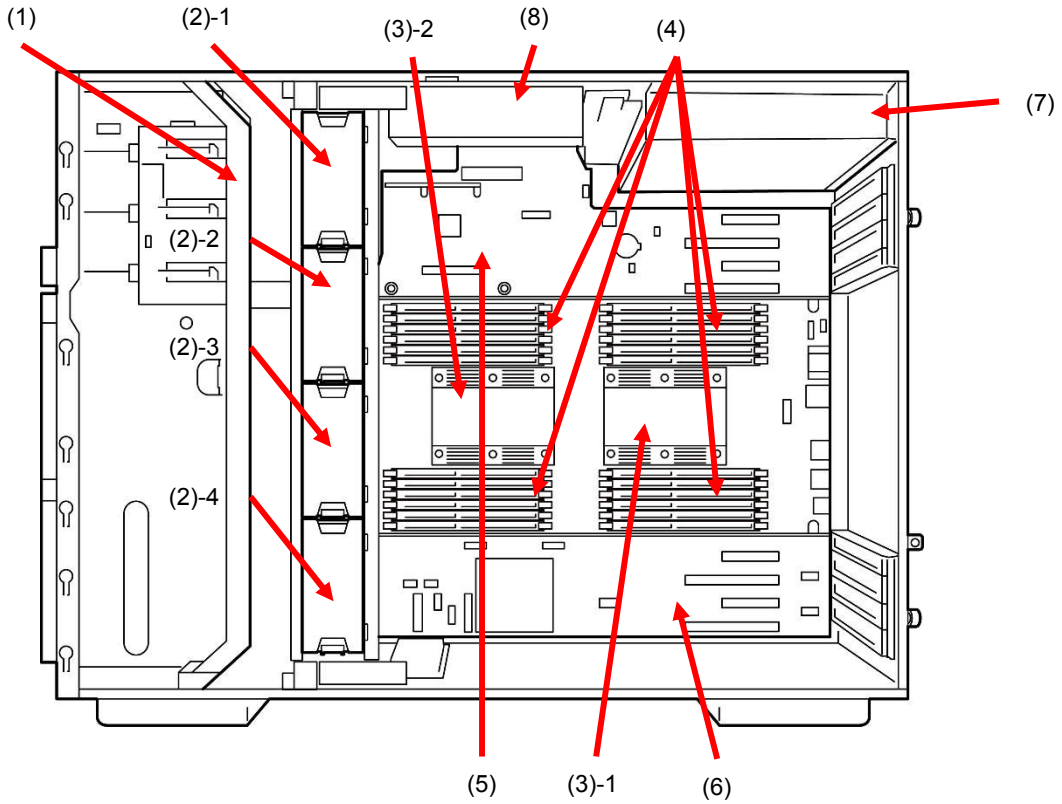
*4 Default values may be different from the factory presets.

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

4.5.2 DIMM slot

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

4.6 Internal View



(1) Backplane

(2) Redundant fan kit (optional)

-1 FAN1
-2 FAN2
-3 FAN3
-4 FAN4

FAN5 and 6 are provided as standard equipment. FANs 1 to 4 are installed when configuring 2 CPUs.

(3) Processor (CPU)
-1 CPU1 (mandatory option)
-2 CPU2 (option)

(4) DIMM (option)
One or more per CPU is a mandatory option

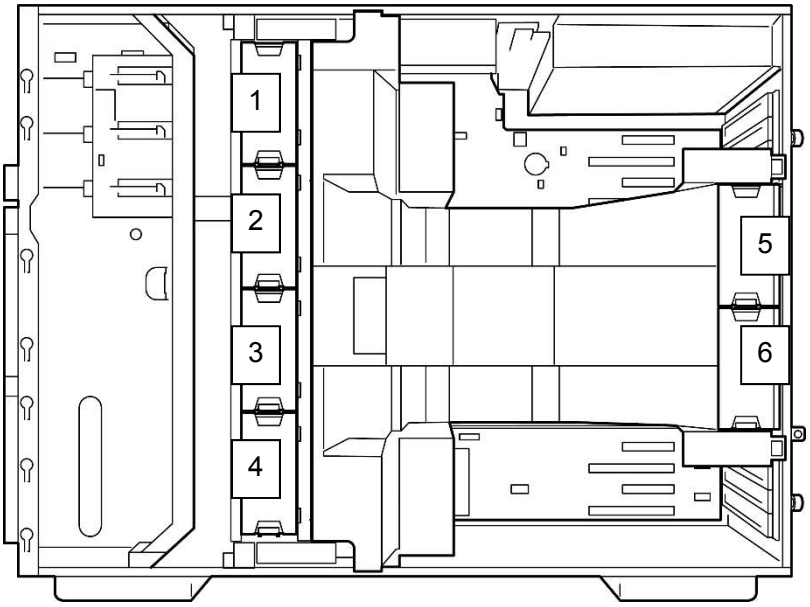
(5) RAID controller PCI card dedicated slot (option)

(6) Motherboard

(7) Power cage
Power supply unit can be mounted (Max. 2)

(8) Battery-holding part for RAID controller

4.7 Hot Plug Compatible Cooling Fan



The following table shows the effective construction of cooling fans.

Configuration	Fan bay 1	Fan bay 2	Fan bay 3	Fan bay 4	Fan bay 5	Fan bay 6
Standard	—	—	—	—	Fan	Fan
Redundant fan kit is installed	Fan	Fan	Fan	Fan	Fan	Fan

For a standard configuration, they are mounted on Fans 5 and 6.

If a redundant fan kit is added, Fans 1 to 4 will be added.

Redundancy will be impaired if a cooling fan failure occurs or any of the cooling fans are missing. If a failure occurs in the second cooling fan or if any of the cooling fans are missing, the server shuts down in the normal manner.

A redundant fan kit is required in the following cases:

- M.2 PCIe is installed
- 2CPU configuration
- 3HDD Cage or 2HDD Cage + Media Drive are installed
- NVMe Cage is installed
- SAS HDD 10/15K is installed
- Ether Card is installed (some types)
  (N8104-183,N8104-187,N8104-188)
- AROC (N8103-191) is installed
- GPU is installed

- When the rack conversion kit is installed

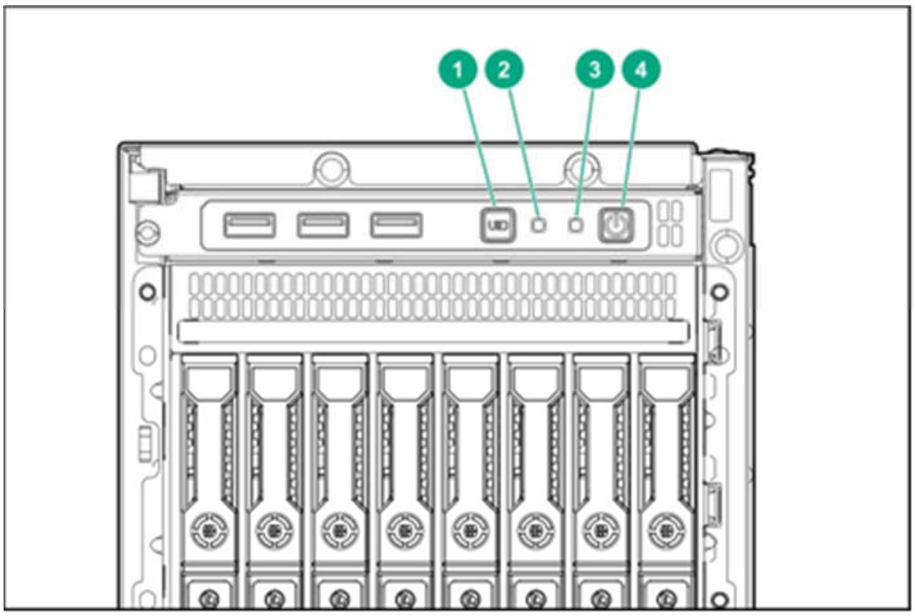
The server supports changing of the rotational speed of cooling fans. Cooling fans rotate at the minimum rotational speed until the temperature rises, and the server becomes necessary to be cooled by raising the cooling fan speed. The server shuts down in the following cases related to temperature:

- If temperature in caution level is detected, iLO 5 performs a normal shutdown at POST execution and OS. If the server hardware detects temperature in critical level before a normal shutdown, the server performs an immediate shutdown.
- If Thermanl Shutdown function is set to Disabled in BIOS/Platform Configuration (RBSU), iLO 5 does not perform a normal shutdown even if a caution temperature level is detected. Even if this feature is disabled, the server hardware performs an immediate shutdown when a critical temperature level is detected.

Important **If Thermal Shutdown function is set to Disabled in BIOS/Platform Configuration (RBSU), high temperature events may damage server components.**

4.8 LED Indication

4.8.1 LEDs on the front side of the unit



No.	Item	Status	Description
1	UID switch/LED *1	Lights in blue	Working in operation
		Flashes in blue (once per second)	Remote control or firmware upgrade is in progress
		Flashes in blue (4 times per second)	The iLO restart sequence using the UID switch has been started
		Flashes in blue (8 times per second)	The iLO restart sequence using UID switch is in progress
		Lights off	Not working
2	LAN 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
3	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 deteriorated
		Flashes in red (once per second)	The system is in a critical state *3
4	POWER switch/LED *1	Lights in green	The system is powered on
		Flashes in green (once per second)	The power-on sequence is in progress
		Lights in amber	The system is in standby state
		Lights off	Power is not supplied *2

*1 If all the four LEDs described in this table are blinking 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 malfunctions, 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.

(1) Function of UID switch

If the server does not turn on, the UID switch can be used to display ProLiant Pre-boot Health Summary.

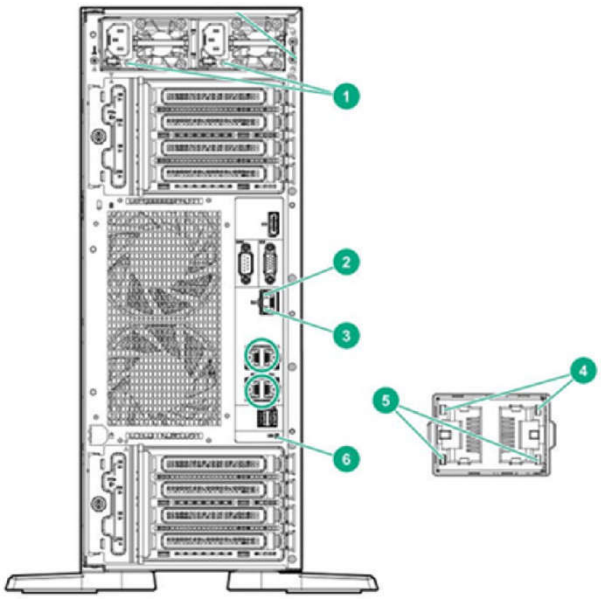
(2) Power failure LED

The following table shows a list of the power failure LEDs and affected subsystems. Not all power failure LEDs are used on all servers.

Subsystem	LED status
Motherboard	Flashes once
Processor	Flashes twice
Memory	Flashes 3 times
PCI riser card PCIe slot	Flashes 4 times
LOM card	Flashes 5 times
RAID controller	Flashes 6 times
Motherboard PCIe slot	Flashes 7 times
Power backplane or storage backplane	Flashes 8 times
Power supply unit	Flashes 9 times

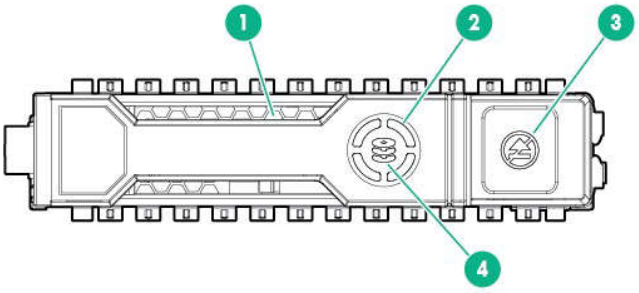
Important **If the LEDs in multiple DIMM slots are lit, further troubleshooting is required. Remove all the other DIMMs and test each bank of DIMMs. Replace each DIMM in the bank with a properly working DIMM to identify the faulty DIMM.**

4.8.2 LEDs on the back side of the unit



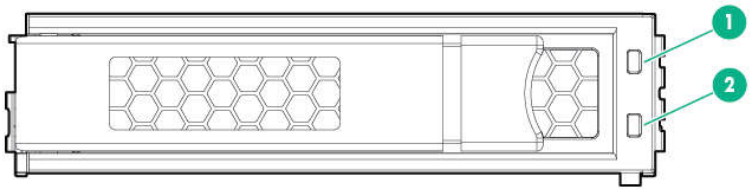
No.	Item	Status	Description
1	AC POWER LED	Lights in green	Normal state
		Lights off	One or more of the following situations are occurring ・AC power is not supplied ・The power supply unit has failed ・The power supply unit is in standby mode ・The power supply unit exceeds the current limit value
2	iLO ACT LED	Lights in green	Working in operation.
		Flashes in green	Working in operation.
		Lights off	Not working.
3	iLO LINK LED	Lights in green	Connected
		Lights off	Not linked to the network.
4	NIC ACT LED	Lights in green	Working in operation.
		Flashes in green	Working in operation.
		Lights off	Not working.
5	NIC LINK LED	Lights in green	Connected
		Lights off	Not linked to the network.
6	UID LED	Lights in blue	Confirmation function is used.
		Flashes in blue	The system is remotely controlled.
		Lights off	Confirmation function is not used.

4.8.3 Hot plug compatible SATA/SAS drive LED (2.5 inch)



No.	Item	Status	Description
1	Position confirmation LED	Lights in blue	The drive is identified by the host application
		Flashes in blue	Drive carrier firmware is being updated or requires an update
2	DISK ACT LED	Rotates in green	Drive is working
		Lights off	Drive is not working
3	Removal-prohibiting switch/LED	Lights in white	Do not remove the drive. Removing a drive will cause one or more logical drives to fail.
		Lights off	Removing the drive will not cause a failure to occur in the logical drive.
4	DISK STATUS LED	Lights in green	The drive is a member of one or more logical drives.
		Flashes in green	The drive is either being rebuilt, performing a RAID level change, changing the strip size, expanding the capacity, or the logical drive is being expanded, or the drive is being erased.
		Flashes in amber/green	A drive failure is predicted to occur because the drive is a member of one or more logical drives.
		Flashes in amber	A drive failure is predicted to occur due to the unconfigured drive.
		Lights in amber	A drive failure has occurred.
		Lights off	RAID controller configuration is not performed in the drive.

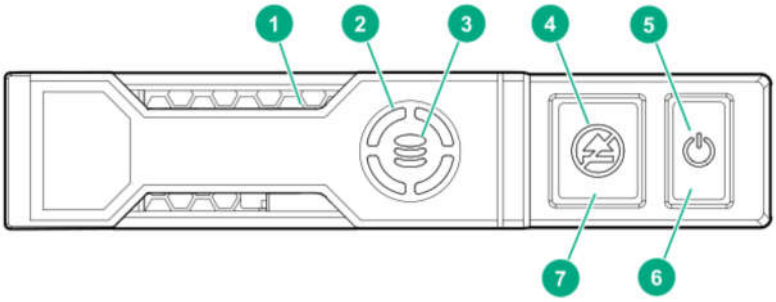
4.8.4 Hot plug compatible SATA/SAS drive LED (3.5-inch)



DISK ACT LED (Green) ②	DISK STATUS LED (Amber/Blue) ①	Description
Lights in green, lights off, or flashes	Flashes in amber and blue	One or more of the following situations are occurring ・ A drive failure has occurred ・ A predictive failure alert has been received for this drive ・ The drive has been selected by the management application
Lights in green, lights off, or flashes	Lights in blue	One or both of the followings are occurring ・ The drive is running correctly ・ The drive has been selected by the management application
Lights in green	Flashes in amber	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
Lights in green	Lights off	The drive is online but is currently not running
Flashes in green (once per second)	Flashes in amber	Do not remove the drive. Removing the drive will shut down the current operation which may lead to a loss of data. The drive is part of an array that is undergoing capacity expansion or stripe migration, but a predictive failure alert has been received for this drive. To minimize the risk of data loss, do not remove the drive until the expansion or migration is complete.
Flashes in green (once per second)	Lights off	Do not remove the drive. Removing the drive will shut down the current operation which may lead to a loss of data. The drive is rebuilding, erasing, or is part of an array that is undergoing capacity expansion or stripe.
Flashes in green(4 times per second)	Flashes in amber	The drive is active but a predictive failure alert has been received for the drive. Replace the drive as soon as possible.
Flashes in green(4 times per second)	Lights off	The drive is running correctly
Lights off	Lights in amber	A critical fault condition has been identified for this drive and the controller has placed it offline. Replace the drive as soon as possible.
Lights off	Flashes in amber	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
Lights off	Lights off	The drive is offline, is a backup, or has not been set as a part of the array

4.8.5 NVMe drive LED

NVMe 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.



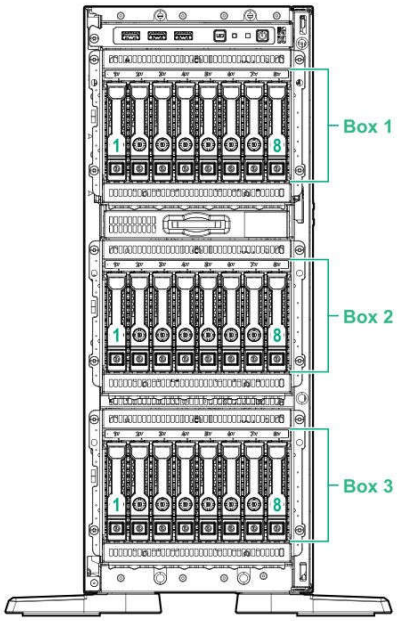
Important **Do not remove the NVMe drive from the drive bay if the removal-prohibiting LED is blinking. The blinking of the removal-prohibiting LED indicates that the device is still in use. Removing the NVMe drive before the device signals and traffic flow are completely terminated may result in data loss.**

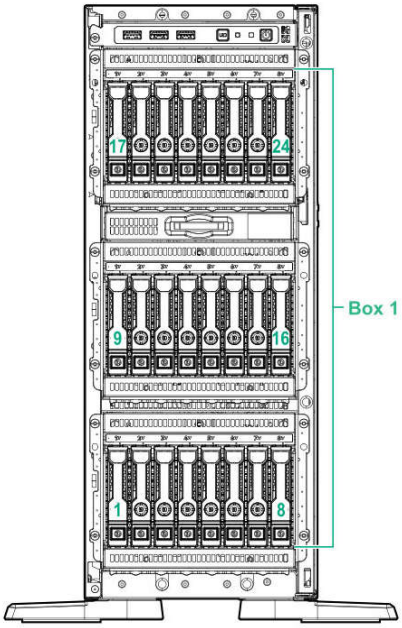
No.	Item	Status	Description
1	Position Check LED	Lights in blue	The drive is identified by the host application
		Flashes in blue	Drive carrier firmware is being updated or requires an update
2	DISK ACT LED	Rotates in green	Drive is working
		Lights off	Drive is not working
3	DISK STATUS LED	Lights in green	The drive is a member of one or more logical drives.
		Flashes in green	The drive is being rebuilt; or the drive is transferring RAID, transferring stripe size, increasing capacity, or increasing the logical drive; or the drive is being erased.
		Flashes in amber/green	The drive is a member of one or more logical drives, and it is estimated that there is a problem with the drive.
		Flashes amber	The drive is not configured, and it is estimated that there is a problem with the drive.
		Lights in green	There is a problem with the drive.
		Lights off	There is no organization in the drive by the RAID controller.
4	Removal Prohibition LED	Lights in white	Do not remove the drive. Remove the drive once it is separate from the PCIe bus.
		Flashes in white	The drive can be removed.
		Lights off	The drive has been removed.

No.	Item	Status	Description
5	Power LED	Lights in green	Do not remove the drive. Remove the drive once it is separate from the PCIe bus.
		Flashes in green	The drive can be removed.
		Lights off	The drive has been removed.
6	Power switch	—	Press the switch to request separated from PCIe. The drive cannot be separated in the following conditions. ・ RAID controllers (One or more logical drives are broken) ・ OS
7	Removal Prohibition switch	—	Press the switch to release the lever.

4.9 Device Number

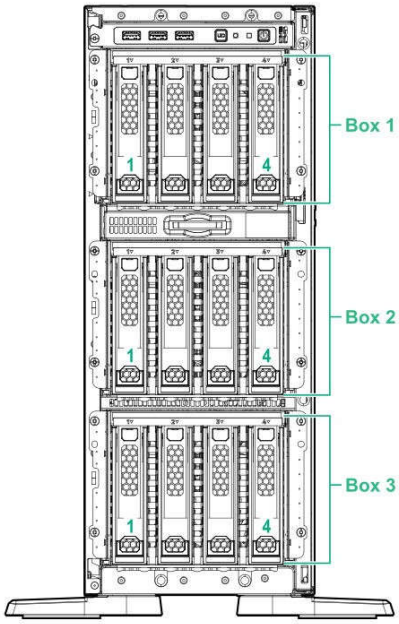
4.9.1 Device number of 8x2.5 inch drive model



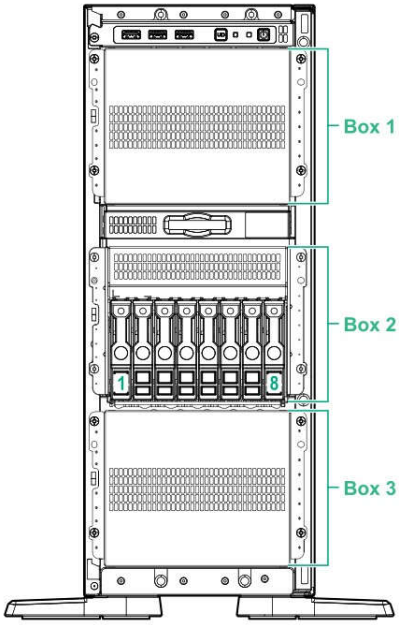


When using an SAS expander card (N8116-83), all devices are counted in sequence as displayed above.

4.9.2 Device number of 4x3.5 inch drive model



4.9.3 Device number of 8x2.5 inch drive model (NVMe/SAS)



NEC Express5800 Series
Express5800/T120h

2 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.

I. 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.**

I.I Safety Precautions

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

⚠ WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, see Safety Precautions and Regulatory Notices.

- **Do not disassemble, repair, or modify the server.**
- **Do not remove the lithium battery, NiMH battery, or Li-ion battery.**
- **Disconnect the power plug when installing and removing devices.**

⚠ 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, see Safety Precautions and Regulatory Notices.

- **Do not drop**
- **Do not leave the server being pulled out.**
- **Make sure to complete installation.**
- **Do not install with the cover removed.**
- **Do not get your fingers caught.**
- **High temperature**
- **Electrical shock**

1.2 Overview of Installation and Removal

Install/remove components by using the following procedure.

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, see Safety Precautions and Regulatory Notices.

- **Do not drop the server**
- **Do not leave the server pulled out of the rack**
- **Replace the cover after installing components**
- **Beware of high temperatures**
- **Do not get your fingers caught when installing components**

1. Remove front bezel if it is installed.
   See *Chapter 2 (1.4 Removing Front Bezel)*.

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

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

Important
- **After disconnecting the power cord from the server, wait for at least 30 seconds before installing/removing optional devices.**
- **Make sure AC POWER LED on power supply unit is unlit.**

4. If only installing a hard disk drive, proceed to step 10. If only installing a power supply unit, proceed to step 11. When installing or removing other internal options, remove from the rack from the main device, and place it on a sturdy, flat desk.
   See *Chapter 2 (2.1 Installation)*.

Important **Do not leave the server being pulled out from the rack.**

5. Remove side cover.
   See *Chapter 2 (1.5 Removing Side Cover)*.

6. Depending on the components to be installed or removed, follow the procedure in order.
   See *Chapter 2 (1.6 TPM Kit)* to *(1.23 Use of Internal Hard Disk Drives in the RAID System)*.

7. Attach side cover.
   See *Chapter 2 (1.24 Installing Side Cover)*.

8. Install hard disk drives.
   See *Chapter 2 (1.25 Drives)*.

9. Install power supply units.
   See *Chapter 2 (1.26 Power Supply Unit)*.

10. Install backup device.
    See *Chapter 2 (1.15 Backup Device)*.

11. Attach front bezel.
    See *Chapter 2 (1.27 Installing Front Bezel).*

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

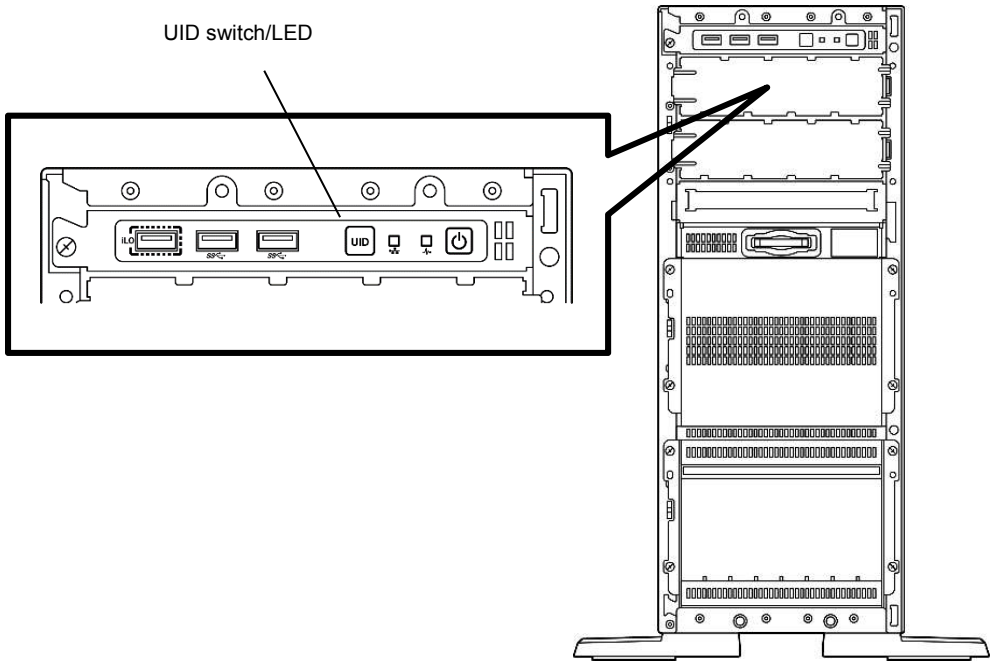
1.3 Identifying Servers (UID Switch)

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

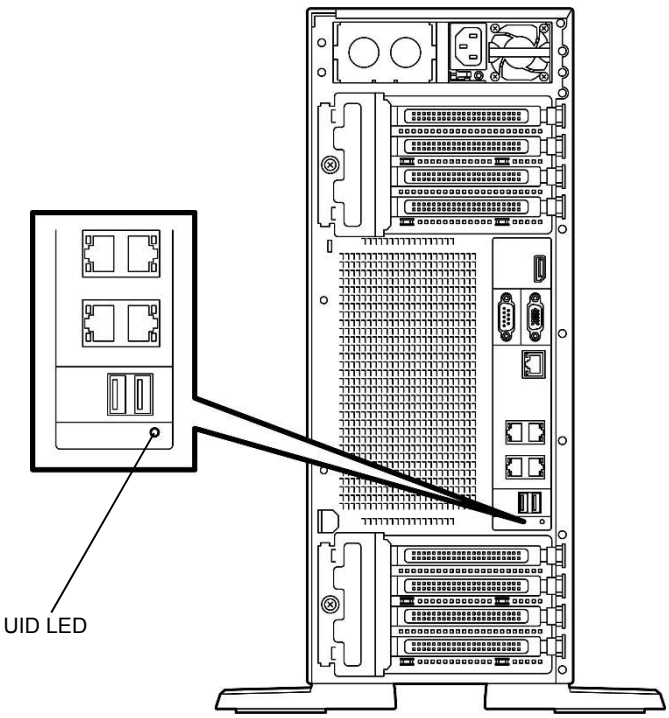
When the server is working, **be sure to identify the target server by using UID Switch first** before you turn off the server or disconnect a cable from the server.

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

Front



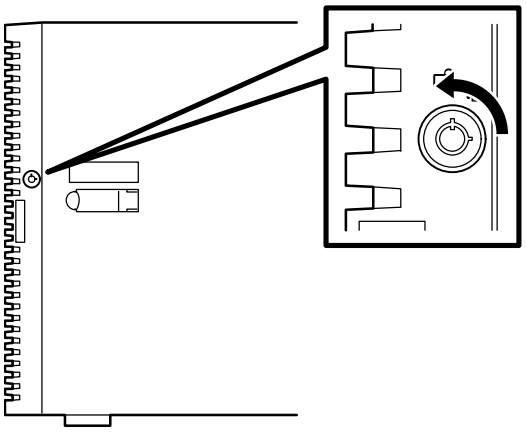
Rear



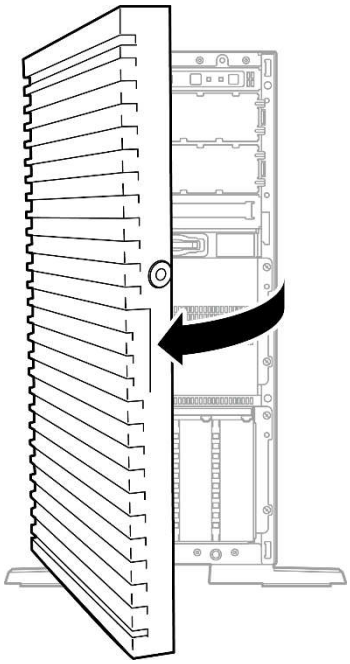
1.4 Removing Front Bezel

Remove the front bezel when pressing the POWER switch or removing side cover.

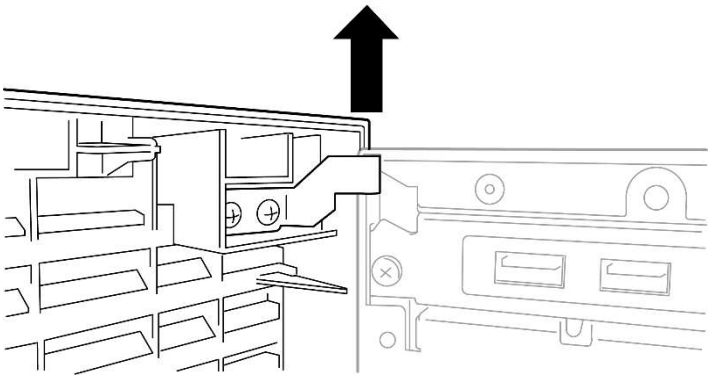
1. To unlock the bezel, insert the attached bezel lock key into the key slot and turn the key while pressing it lightly.



2. Put your hand on the right side of the front bezel to pull open the front bezel.



3. Slide the front bezel upward while it is fully opened, remove the edges of the hinges (2 places on upper and lower side) from the hole of the chassis, and remove the front bezel from the main unit.



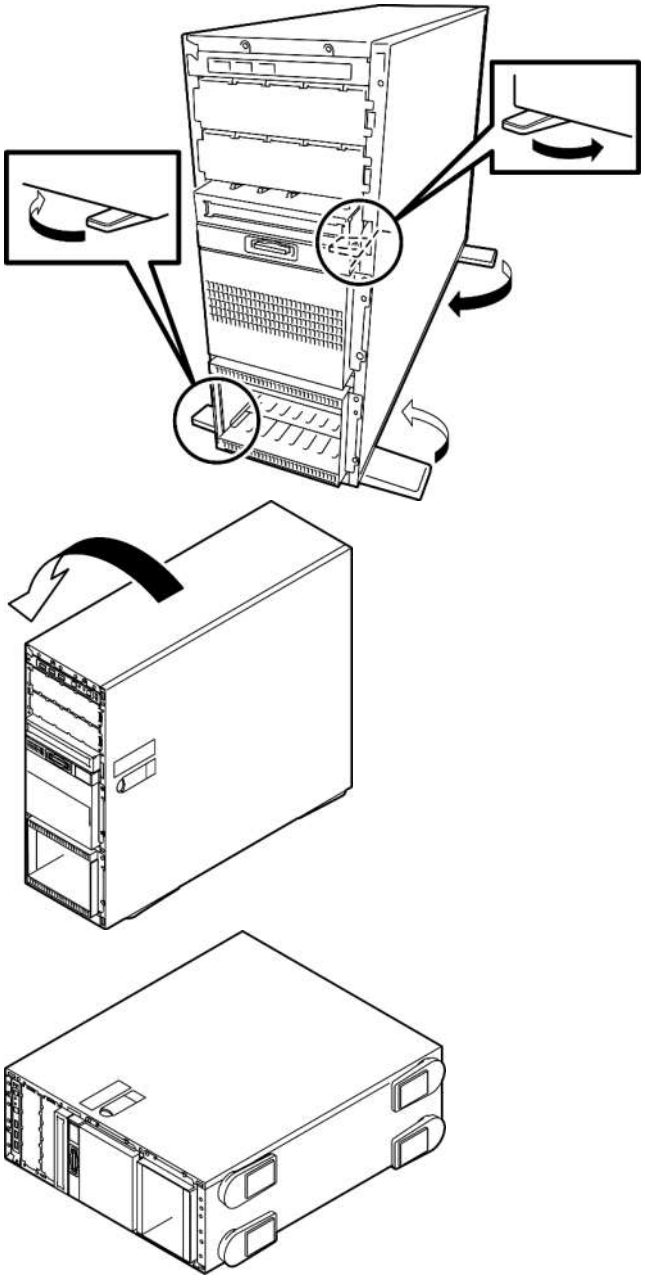
Important **If you fail to remove the front bezel properly, the front bezel might be damaged.**

1.5 Removing Side Cover

Remove side cover when installing or removing the optional component or change internal cable connection. Please have ready a hexalobular driver (T-15).

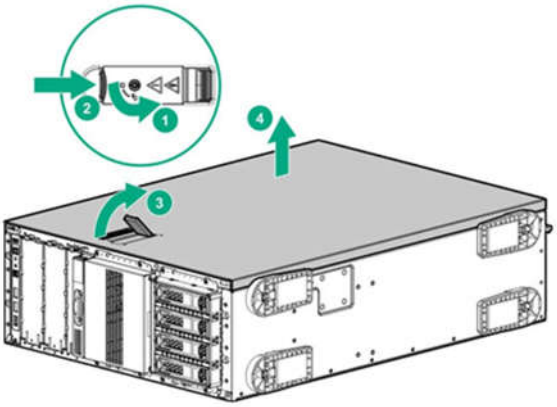
Important **For safety reasons, please operate with the device laid on its side.**

1. See steps 1 to 5 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Rotate the 4 stabilizers of the server and lay it sideways.



3. Open the security screw on the side cover lever with a hexalobular screwdriver (①).
4. Push the locking latch toward the back side (②), release the lock, and pull the lever (③).

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



1.6 TPM Kit

Install the TPM (Trusted Platform Module) kit to this machine following the procedure in *1.6.1 Installing the TPM kit*.

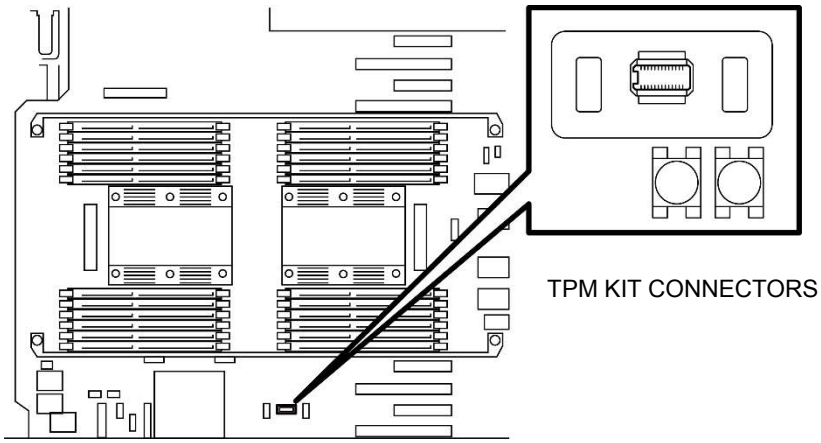
When using drive encryption technologies, such as Microsoft Windows BitLocker Drive Encryption feature, you must enable TPM. For more information, see the Microsoft Web site.

Important **Follow the procedures precisely as they are described in this section. If instructions are not followed, the hardware may be damaged and TPM may not work correctly.**

During installation or replacement of the TPM follow these guidelines.

- Do not remove the installed TPM. Once the TPM is installed, it becomes a permanent part of the system board.
- During hardware installation or replacement our service counter cannot to enable TPM or encryption technology. For security reasons, please enable it yourself.
- When returning the system board for service replacement, do not remove the TPM from the system board.
- Trying to remove the TPM from the system board may damage or deform the TPM security rivets. If rivets on the installed TPM are found to have been damaged or deformed, the administrator will assume that the security of the system has been breached, and it will be necessary to take appropriate measures to ensure the integrity of the data system.
- Please keep the recovery key/password when using BitLocker. When BitLocker detects the system integrity may be compromised the recovery key/password is necessary for recovery mode.
- Our company will not be responsible for any data access block that was caused by improper use of the TPM. Please see the encryption technology functions document attached to each operating system to operate the encryption functions used by TPM.

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



1.6.1 Installing the N8115-35 TPM

Important **Please make sure the power cord has been unplugged to prevent personal injury, electrical shock, or damage to the unit. The main machine cannot be turned off completely just by using the POWER SWITCH on the front panel. Until the power cord is unplugged from the power some internal circuits will remain energized.**

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.**

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

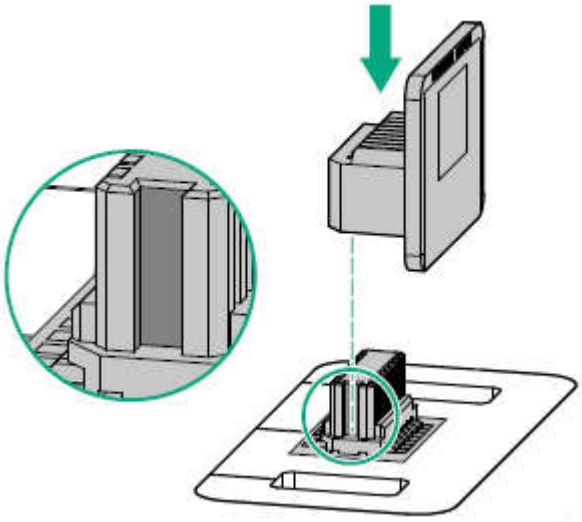
To install the components, follow these steps.

1. Update System Utility.

   Please download the latest version from our support center website.

   For updating System Utilty, 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.



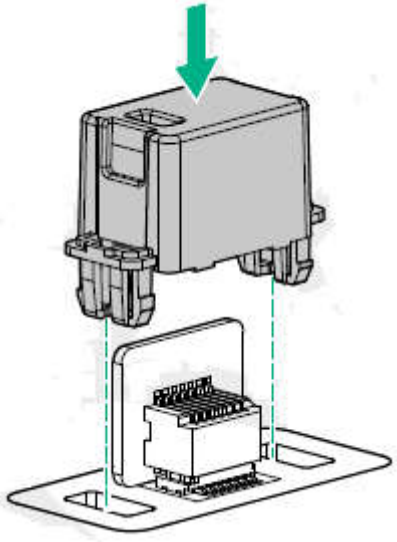
Note

Once installed, do not remove the TPM cover from the mother board. This may cause the TPM cover, TPM, and the mother board to malfunction or to be damaged.
Note also that the data stored in the TPM, including the key, will be deleted if the TPM is removed and attached to another server and then energized.

Note

Use TPM under the designated condition. If you install TPM in a different condition, TPM or the mother board may break or may be damaged.

5. Install 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 (1.24 Installing Side Cover)* to attach the side 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.

1.6.2 Notes on Windows BitLocker

After you have finished setting up BitLocker, a recovery key/password will be generated.
When BitLocker detects the system integrity may be compromised the recovery key/password is necessary for recovery mode. Please keep the recovery key/password when using BitLocker.
Once BitLocker has been enabled, you can save and print them.

To ensure security, please keep the recovery key/password information according to the following guidelines.

- Be sure to store in multiple locations.
- Store away from the machine.
- Do not store on a BitLocker encrypted hard disk drive.

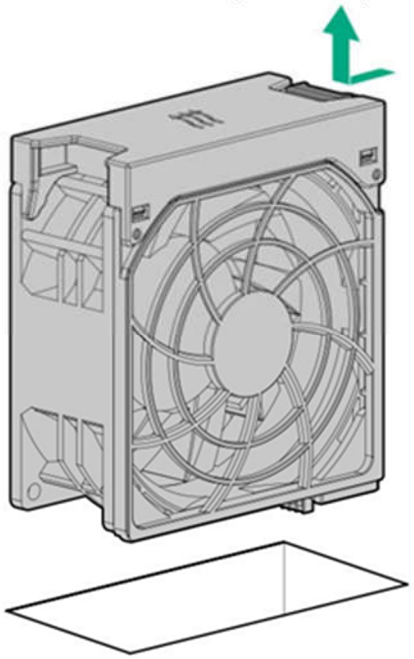
1.7 Removing the Fan

When you change the fan, or you need to remove it, follow the procedure below.

Important **Do not pull out the fan when it rotates correctly.**
When removing a fan using hot plugging, the fan will be still running so please wait until it stops.

1.7.1 Removing the standard fan

1. Push the lever of fan to unlock, then lift up the fan to pull out.

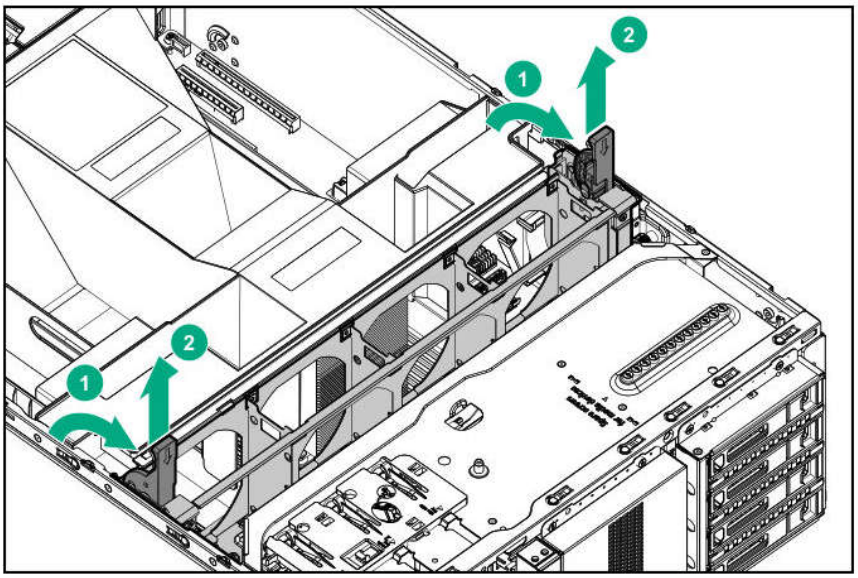


1.7.2 Removing the redundant fan kit

If you need to remove the fan of redundant fan kit only, pull it out as the same steps for the standard fan.

To remove the fan bay of redundant fan kit, follow the procedure below.

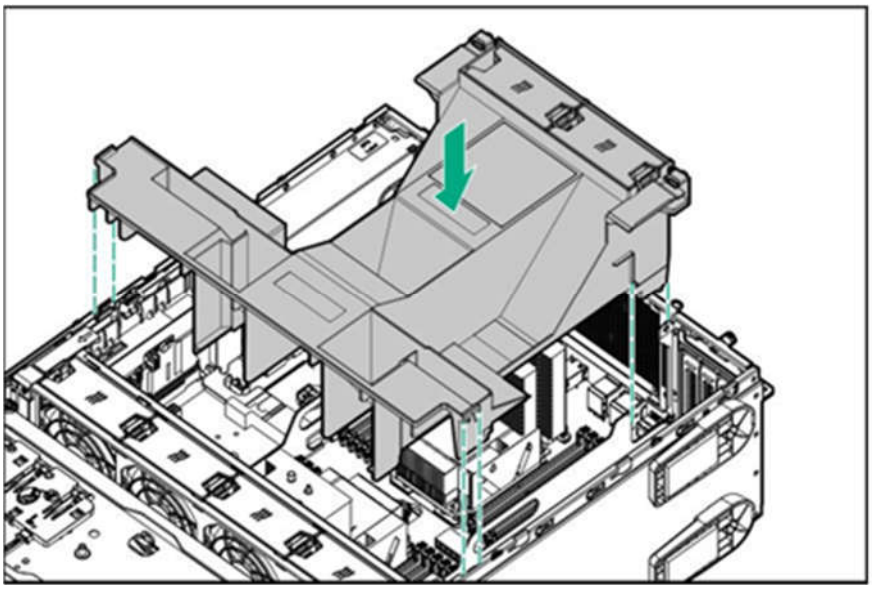
1. Lift up the levers at both sides of fan bay (①).
2. Lift up the fan bay to remove it (②).



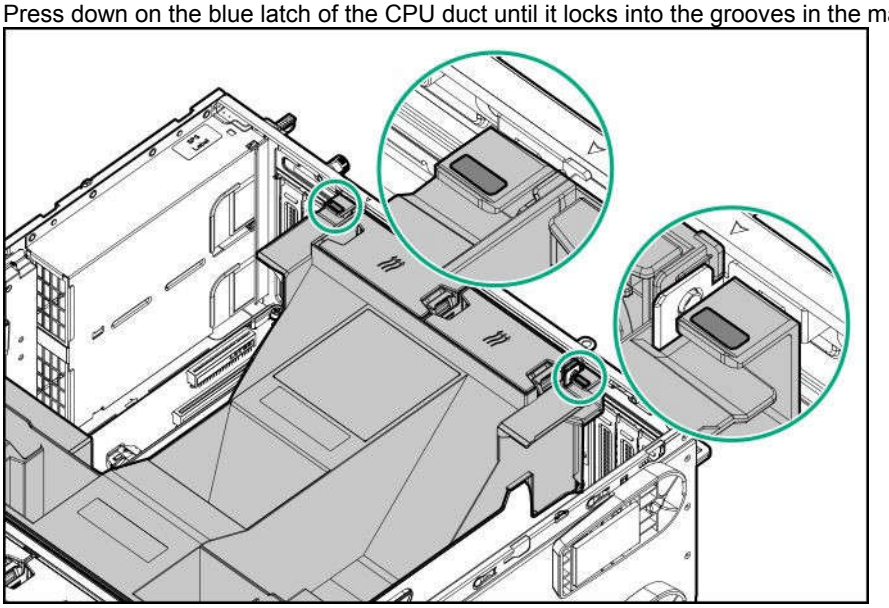
1.8 Installing/Removing CPU Duct

1.8.1 Installation

1. To attach the CPU duct onto the main unit, align the CPU duct to the dotted lines in the diagram below.



2. Press down on the blue latch of the CPU duct until it locks into the grooves in the main unit.



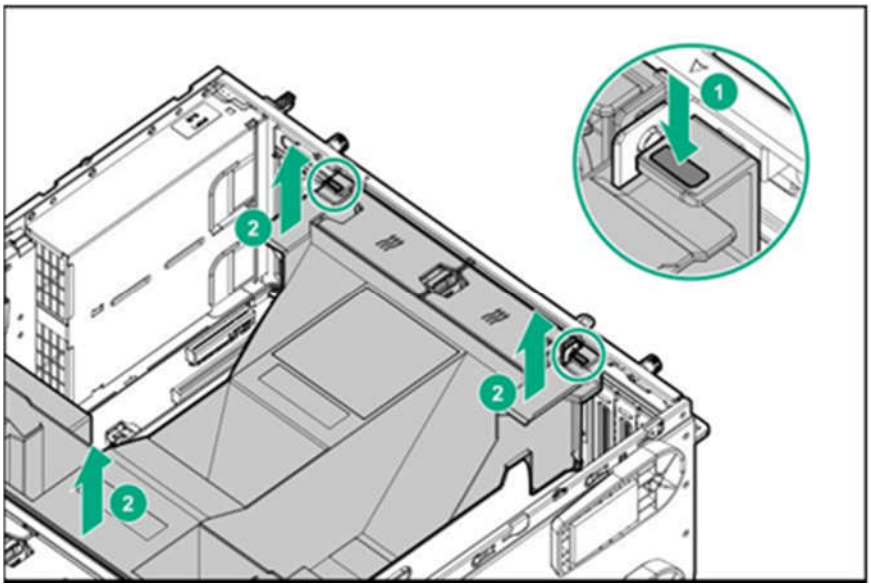
3. Attach the side cover.

1.8.2 Removal

When installing/removing the following options or changing the connection of cables inside, remove CPU duct before the work following the procedure below.

- DIMM (memory)
- Processor (CPU)
- Fan
- PCI card to be mounted in the RAID exclusive slot
- PCI card (some types of cards including SAS expander)
- Back-up device etc.
- HDD cage

1. Push the latch of CPU duct at the back of body to unlock (①).
2. While keeping pressing the latch (①), lift up the CPU duct to dismantle it from the body (②).



1.9 Processor (CPU)

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.

Note 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.

Note 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.

1.9.1 Maximum number of processor cores supported by this server

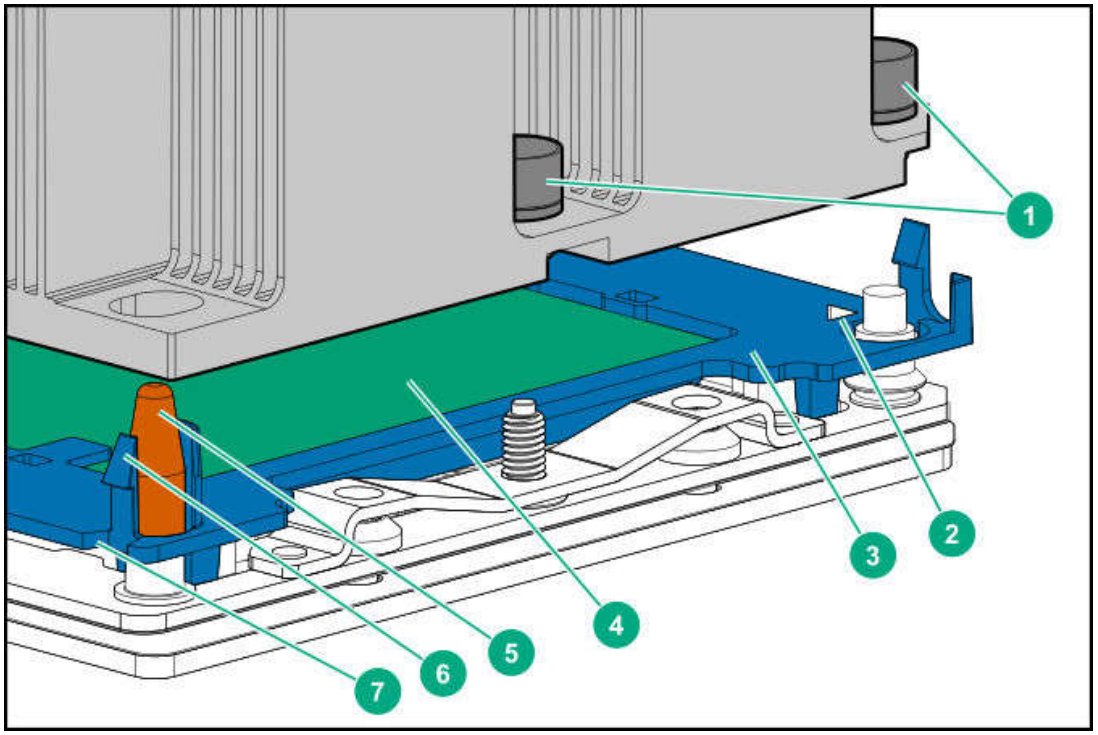
The maximum number of processor cores (logical processors) available on the server depends on the architecture (x86 architecture) and OS specs.

Maximum number of processor cores

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
Red Hat Enterprise Linux 7 (x86_64)	240	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

1.9.2 Processor heat sink module and socket



① Heat sink nut
② Pin 1 indicator *1
③ Processor frame
④ Processor
⑤ Heat sink alignment post
⑥ Heat sink latch
⑦ Release slot *2

*1 Mark attached to the processor and heat sink

*2 Parts to separate the processor and the heat sink

1.9.3 Installation

Please prepare the following before installing the option.

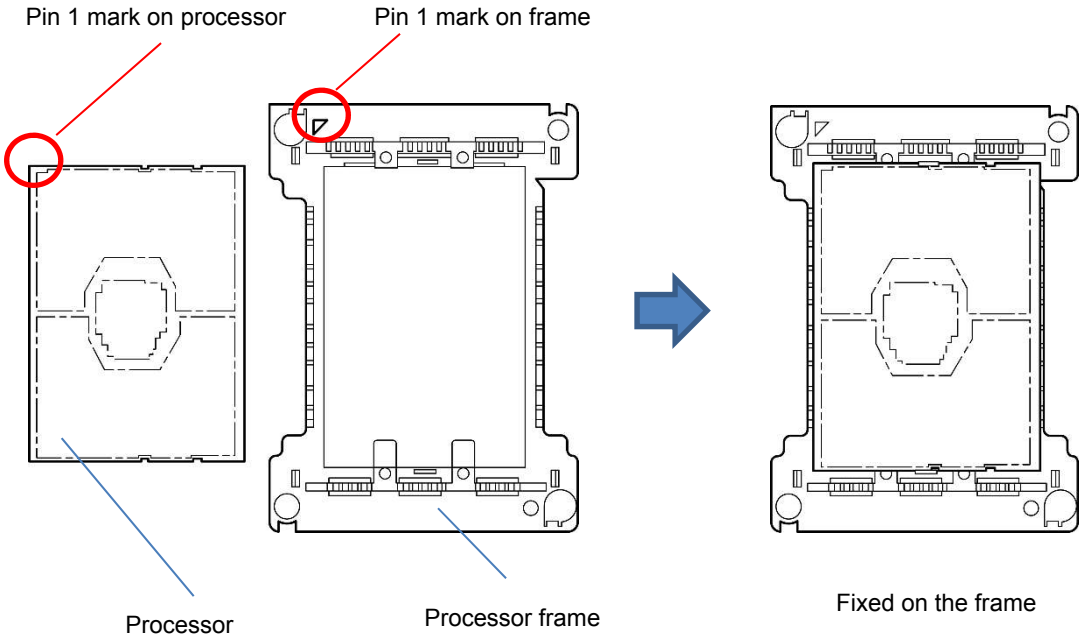
- Parts included in the optional processor heat sink kit
- T-30 hexalobular driver

To install the components, follow these steps.

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

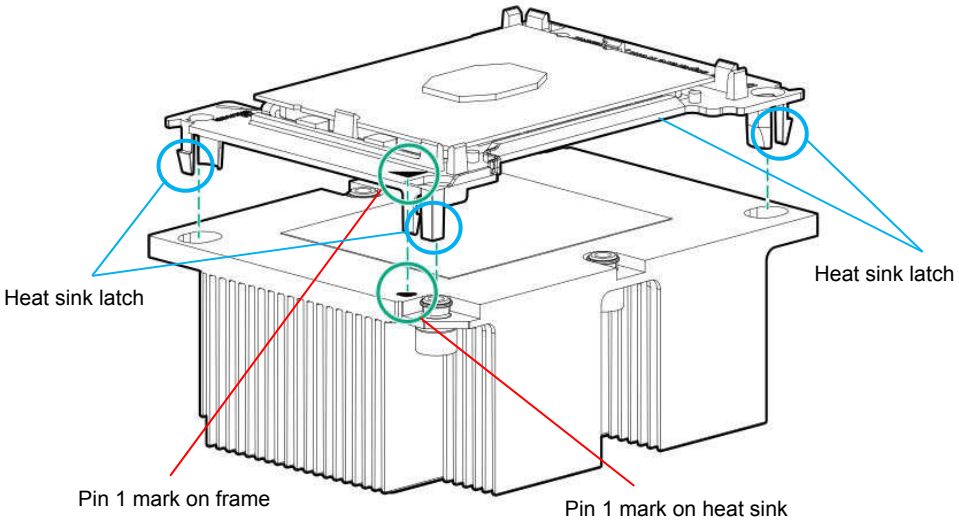
2. Align the pin 1 mark on the processor with the pin 1 mark on the processor frame and attach to the frame by gently pressing down on the processor.

Note Do not touch the point of contact of the processor.



3. Remove the dust cover on the heat sink.

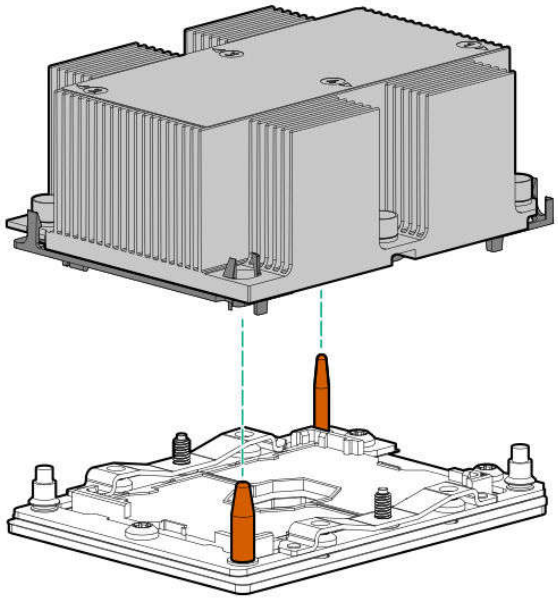
4. Align the pin mark 1 on the processor frame with the pin mark 1 on the heat sink, attach the heat sink latch on the heat sink by gently pressing the corners of the processor frame from the top.



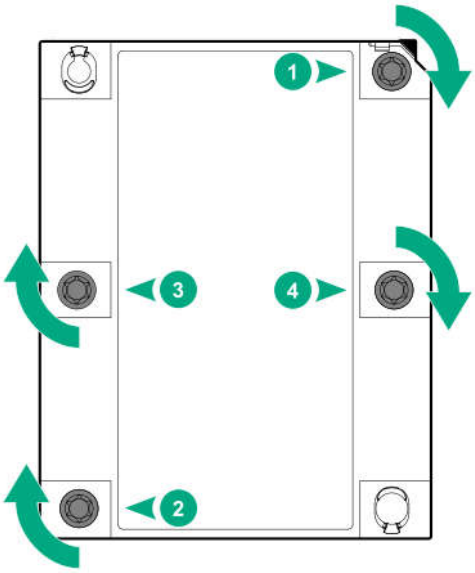
5. Confirm the location of the processor and remove the processor socket protective cover.

Note Keep the removed protective cover for future use.

6. Align the socket alignment pins with the module on the top of the motherboard, press gently down so it contacts with the motherboard evenly.
   The socket alignment pin is a key, so the processor can be installed in only one direction.



7. Tighten the heat sink screws (4 PCs) with a T-30 hexalobular driver in the following order (1 → 2 → 3 → 4) to secure.



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

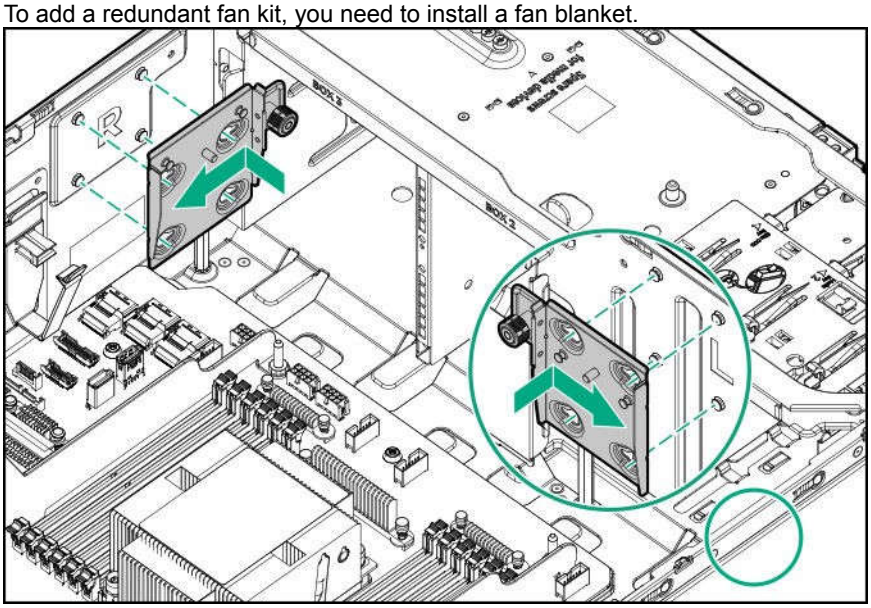
Note

- 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.

1.9.4 Addition of redundant fan kit (when an additional CPU is mounted)

To mount an additional CPU, you need to add the redundant fan kit. Add a redundant fan kit following the procedure below.

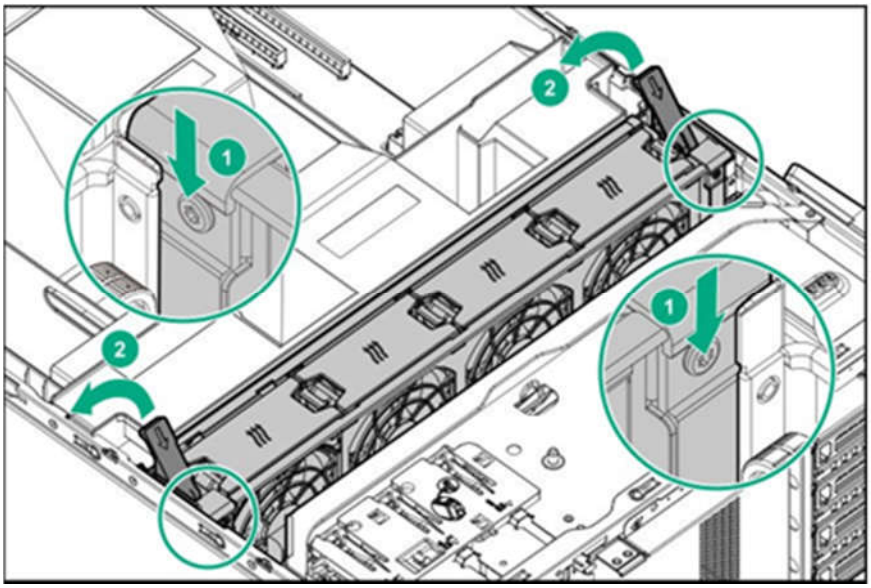
1. To add a redundant fan kit, you need to install a fan blanket.



2. Fix all the cables using the cable management function of body.

3. Fit the fan bay into the fan blanket of body (①).

4. Pull down the levers to fix (②).



1.9.5 Installing side cover

1. See *Chapter 2 (1.24 Installing Side Cover)* to attach the side 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.

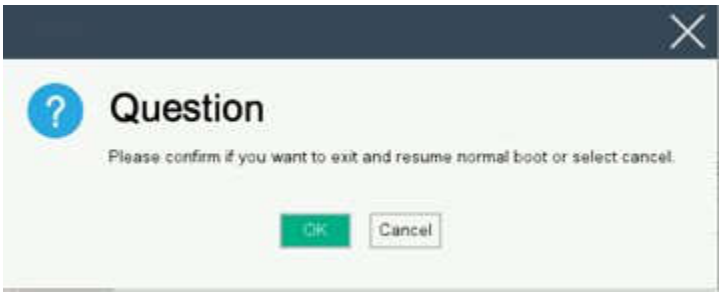
2. See *Chapter 2 (2 Installation and Connection)* to conduct installation and connection, and turn the power supply ON.

1.9.6 Identifying processor type

The type of processor installed on the server is displayed simply on the POST.

If you need to confirm detailed information on processor type or specification of additional processor, follow the procedure below.

1. Reboot the server.
   The server restarts and the POST screen is displayed.
2. Press <F9>
   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**> until the main menu is displayed.
5. After the menu below is displayed, select [OK] to leave System Utility and move to Boot mode.



1.9.7 Replacement / Removal

Important

Do not remove any CPU unless it is failed.
To remove the heat sink from the CPU, first turn the heat sink to the left and right lightly to make sure that the heat sink can be apart from the CPU. Removing the heat sink with it adhering to the CPU may cause the CPU and/or CPU socket to be defected.
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 redundant fan kit.
3. Attach the fan blank cover.

1.10 High-performance CPU Heat Sink Module

A high-end heat sink module for CPU is required if you use certain types of CPU. Even if you use a type of CPU which is operable with a standard heat sink, you can reduce the electricity consumption of fan by using a high-end heat sink module for CPU.

The electricity consumption of fan changes depending on the configuration of server and the workloads.It is optimized in accordance with the amount of workloads, the density of configuration, the expansion of peripheral configuration, etc.

For the list of CPUs supports high-performance CPU heat sink module, refer to the web site of NEC

1.10.1 Handling precautins

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 of the server. Until the AC power cord is unplugged, the power supply circuit is still active in some parts of the machine.

1.10.2 Installation

Before installing a high-end heat sink module for CPU, prepare the followings.

- Parts included in the optional processor heat sink kit
- T-30 hexalobular driver
- 1/4-inch wide flat-blade screwdriver

To install the components, follow these steps.

Note In order to avoid the damage to the processor and the mother board, take care only authorized persons change or install a processor.

Note In order to prevent the malfunctions of server and the damage to devices, use processors with the same parts number if you adopt multiprocessor configuration.

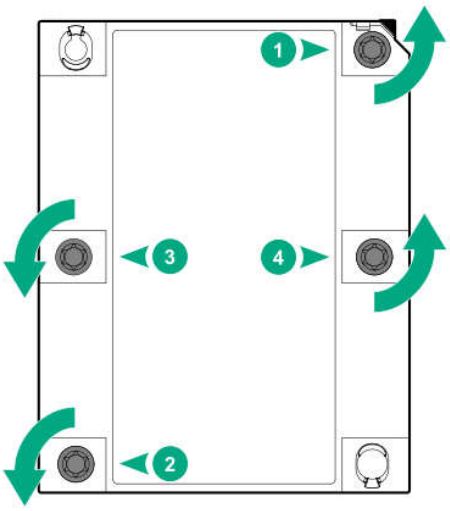
Note If you intend to actuate a processor at faster speed, update the system ROM before installing a processor.

Follow the procedure below to install.

1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Following the steps below, detach the processor heat sink module.

① Wait for the heat sink to cool.
② Use a T-30 hexalobular driver to loosen the heat sink screws (4 PCs) in the following order (4→3→2→1).

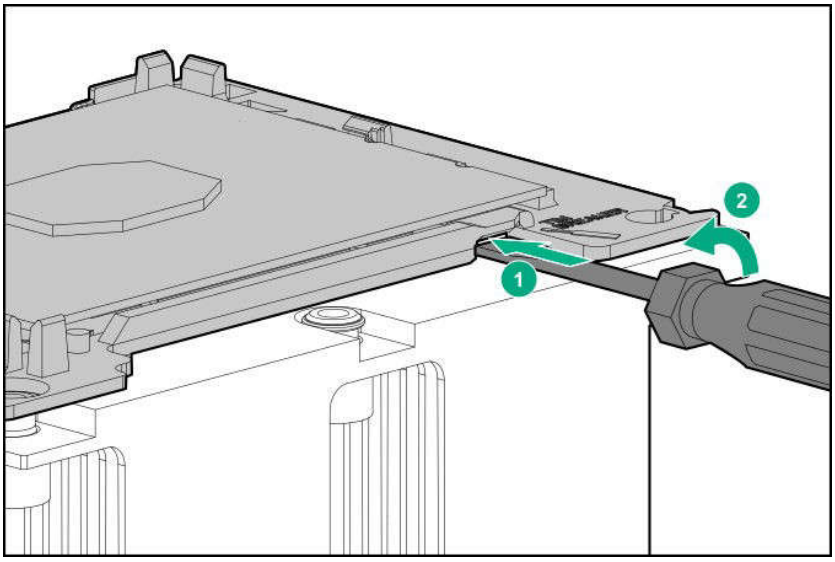
Note Contacts on the motherboard are very fragile and easily damaged. To avoid damage to the motherboard, do not touch the processor or processor socket contact.



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.

3. Following the steps below, detach 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 (❶).
Check that the flat-blade screwdriver is between the heat sink and the processor frame.
③ Rotate the screwdriver gently to lift the processor frame from the heat sink(❷)

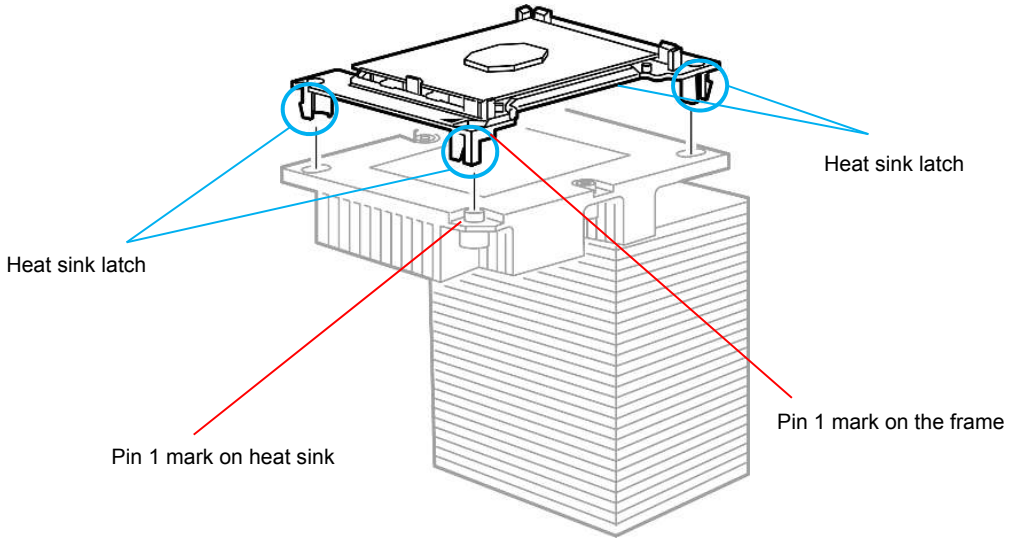


④ Disconnect all the latches on the processor frame corner.
⑤ Remove the processor frame from the heat sink.

4. Remove thermal grease adherent to the processor with washing. After the washing becomes totally dry, apply new thermal grease.

Note Do not touch the point of contact of the processor.

5. Remove the dust cover of the high-performance heat sink.
6. 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. Confirm that the heat sink latches at the four corners of processor frame are fixed to the heat sink.

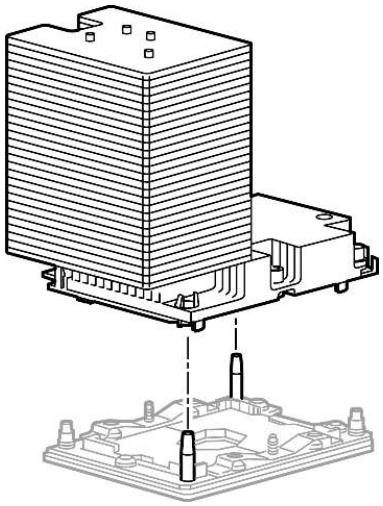


7. Confirm the location of the processr, remove the processor socket protective cover.

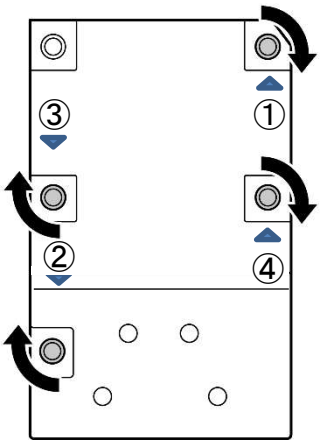
Note

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.

8. Fit the socket alignment pin on the mother board into the hole of high-end heat sink module for CPU, and then lower the pin slowly until the contact face of processor contacts the mother board equally.
As the socket alignment pin is a key, a processor can be fixed only for the one direction.



9. Using T-30 hexalobular driver, tighten the screws at the four corners of the high-end heat sink module for CPU following the order shown on the label. Tighten the screws fully to fix.



10. 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.

11. See *Chapter 2 (1.24 Installing Side Cover)* to attach the side 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. See Chapter 2 (2 Installation and Connection) 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.

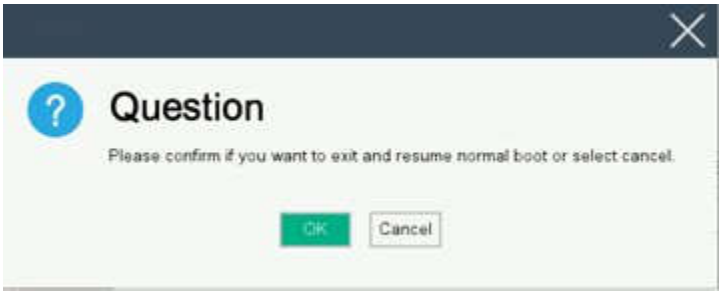
To view this information and additional processor specifications follow the directions below

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> 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.
To remove the heat sink from the CPU, first turn the heat sink to the left and right lightly to make sure that the heat sink can be apart from the CPU. Removing the heat sink with it adhering to the CPU may cause the CPU and/or CPU socket to be defected.
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 replace or 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 redundant fan kit.
3. Mount the fan blank cover.

1.11 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 (1.8Anti-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 1536GB (64 GB x 24) can be installed in 2-CPU configuration. Up to 768 GB (64 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.

Hereafter, the information applicable to all types is mentioned as "DIMM." If it is written LRDIMM or RDIMM, it is the information applicable only to these types.
Memories installed to the server have to be the same type.

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.**

1.11.1 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	1.5TB
Microsoft Windows Server 2016 Standard *1 Microsoft Windows Server 2016 Datacenter *1	24TB	1.5TB
Red Hat Enterprise Linux 7	12TB	1.5TB
VMware ESXi 6.0 *2	6TB	1.5TB
VMware ESXi 6.5 *3	12TB	1.5TB

*1: Shown below is the maximum memory size when Hyper-V is used:
- Windows Server 2012 R2: 4TB
*2: Up to 4 TB on virtual machine
*3: Up to 6 TB on virtual machine

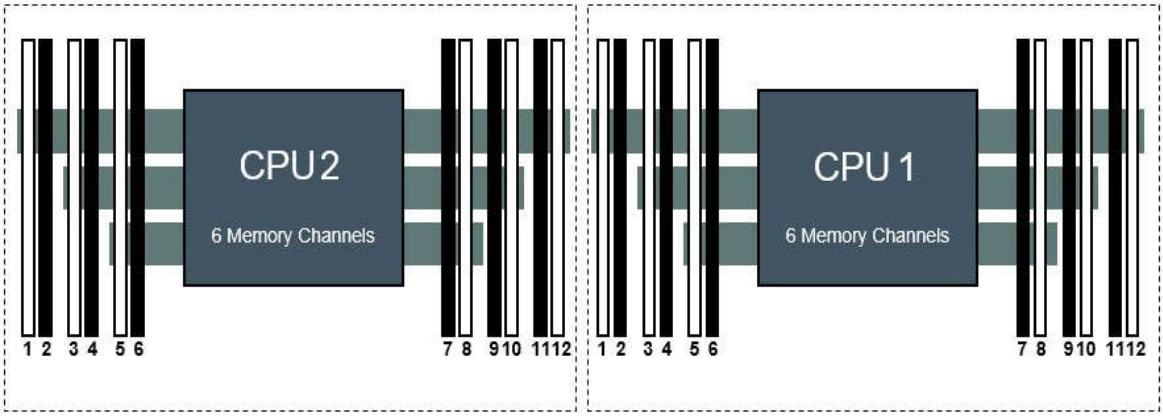
1.11.2 DIMM installation order

Note See Memory RAS features supported by additional memory board.

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.

2 slot/channel



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												CPU1 slot number											
2 DIMM								**8**												**8**				
3 DIMM								**8**												**8**		**10**		
4 DIMM								**8**		**10**										**8**		**10**		
5 DIMM								**8**		**10**										**8**		**10**		**12**
6 DIMM								**8**		**10**		**12**								**8**		**10**		**12**
7 DIMM								**8**		**10**		**12**			**3**		**5**			**8**		**10**		
8 DIMM			**3**		**5**			**8**		**10**					**3**		**5**			**8**		**10**		
9 DIMM			**3**		**5**			**8**		**10**					**3**		**5**			**8**		**10**		**12**
10 DIMM			**3**		**5**			**8**		**10**		**12**			**3**		**5**			**8**		**10**		**12**
11 DIMM			**3**		**5**			**8**		**10**		**12**	**1**		**3**		**5**			**8**		**10**		**12**
12 DIMM	**1**		**3**		**5**			**8**		**10**		**12**	**1**		**3**		**5**			**8**		**10**		**12**
13 DIMM	**1**		**3**		**5**			**8**		**10**		**12**	**1**		**3**		**5**		**7**	**8**		**10**		**12**
14 DIMM	**1**		**3**		**5**		**7**	**8**		**10**		**12**	**1**		**3**		**5**		**7**	**8**		**10**		**12**
15 DIMM	**1**		**3**		**5**		**7**	**8**		**10**		**12**			**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
16 DIMM			**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**					**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
17 DIMM			**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**			**1**		**3**		**5**		**7**	**8**	**9**	**10**	**11**	**12**
18 DIMM	**1**		**3**		**5**		**7**	**8**	**9**	**10**	**11**	**12**	**1**		**3**		**5**		**7**	**8**	**9**	**10**	**11**	**12**
19 DIMM	**1**		**3**		**5**		**7**	**8**	**9**	**10**	**11**	**12**	**1**		**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		**12**
20 DIMM	**1**		**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		**12**	**1**		**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		**12**
21 DIMM	**1**		**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		**12**	**1**		**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
22 DIMM	**1**		**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**		**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
23 DIMM	**1**		**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
24 DIMM	**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.

Model number	N8102-				
	708	709	710	711	712
N8102-708, 8GB/R, 1R	○	○	○	○	×
N8102-709, 16GB/R, 1R	○	○	○	○	×
N8102-710, 16GB/R, 2R	○	○	○	○	×
N8102-711, 32GB/R, 2R	○	○	○	○	×
N8102-712, 64GB/LR, 4R	×	×	×	×	○

○: Allowed to be installed together
×: Not allowed to be installed together
* : Not allowed to be installed together except the combinations on the table above.

1.11.3 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	2,666MHz
Xeon ® Gold 6100 Series	
Xeon ® Gold 5122 Processor	
Xeon ® Gold 5100 Series (except Xeon ® Gold 5122 processor)	2,400MHz
Xeon ® Silver 4100 Series	
Xeon ® Bronze 3100 Series	2,133MHz

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

Depending on the models of processor, the number of DIMM installed and whether LRDIMM or RDIMM is installed, the memory clock rate may fall to 1,866 MT/s.

The maximum memory capacity

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

N code	DIMM type	DIMM rank	Capacity (GB)	1CPU（GB）	2CPU（GB）
N8102-708	RDIMM	Single	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

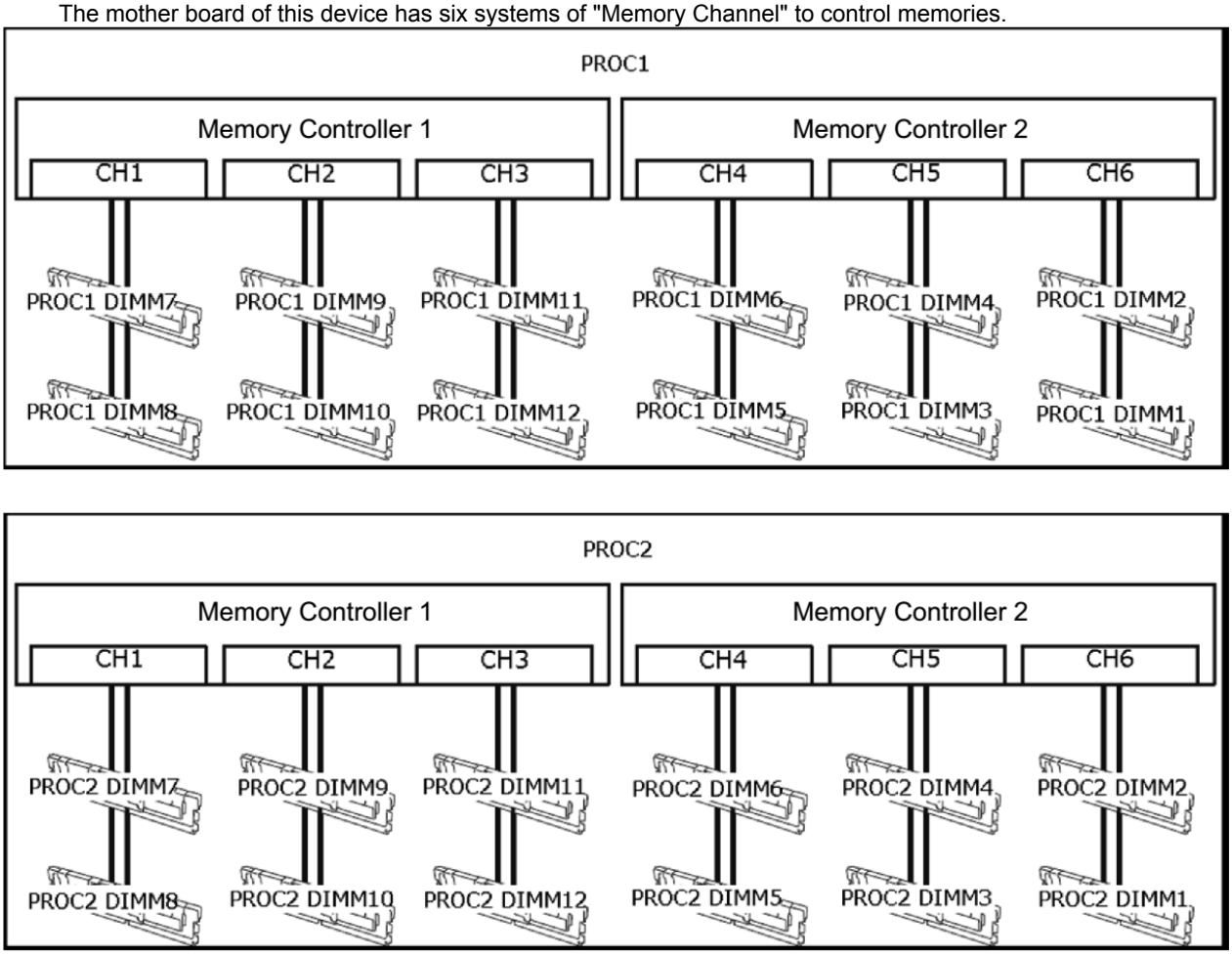
1.11.4 Memory Function

As the memory RAS function, the device has "Advanced ECC Function (x4 SDDC)", "Memory ADDDC Function" , "Memory Mirroring Function" and "Memory Sparing Function."

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

"Memory ADDDC function" of this device allows the correction of memory errors and continuation the operation even whilst failures occur in multiple DRAM devices on the DIMM. This provides protection against uncorrectable memory errors beyond those available in Advanced ECC.

The mother board of this device has six systems of "Memory Channel" to control memories.

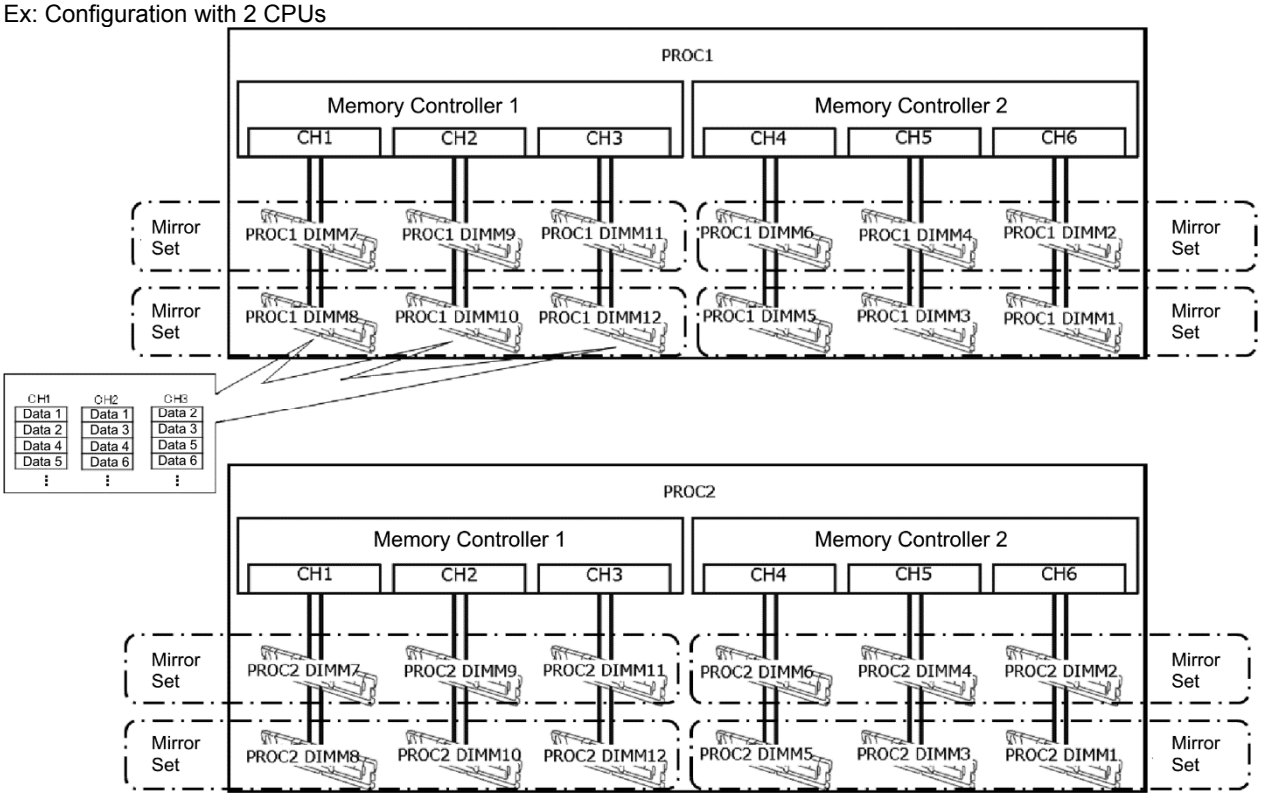


"Memory Mirroring Function" and "Memory Sparing Function" are functions to keep redundancy by executing the monitoring of memory and switching among memory channels.

(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 (channel 1, channel 2 and channel 3 or channel 4, channel 5 and channel 6).

Ex: Configuration with 2 CPUs



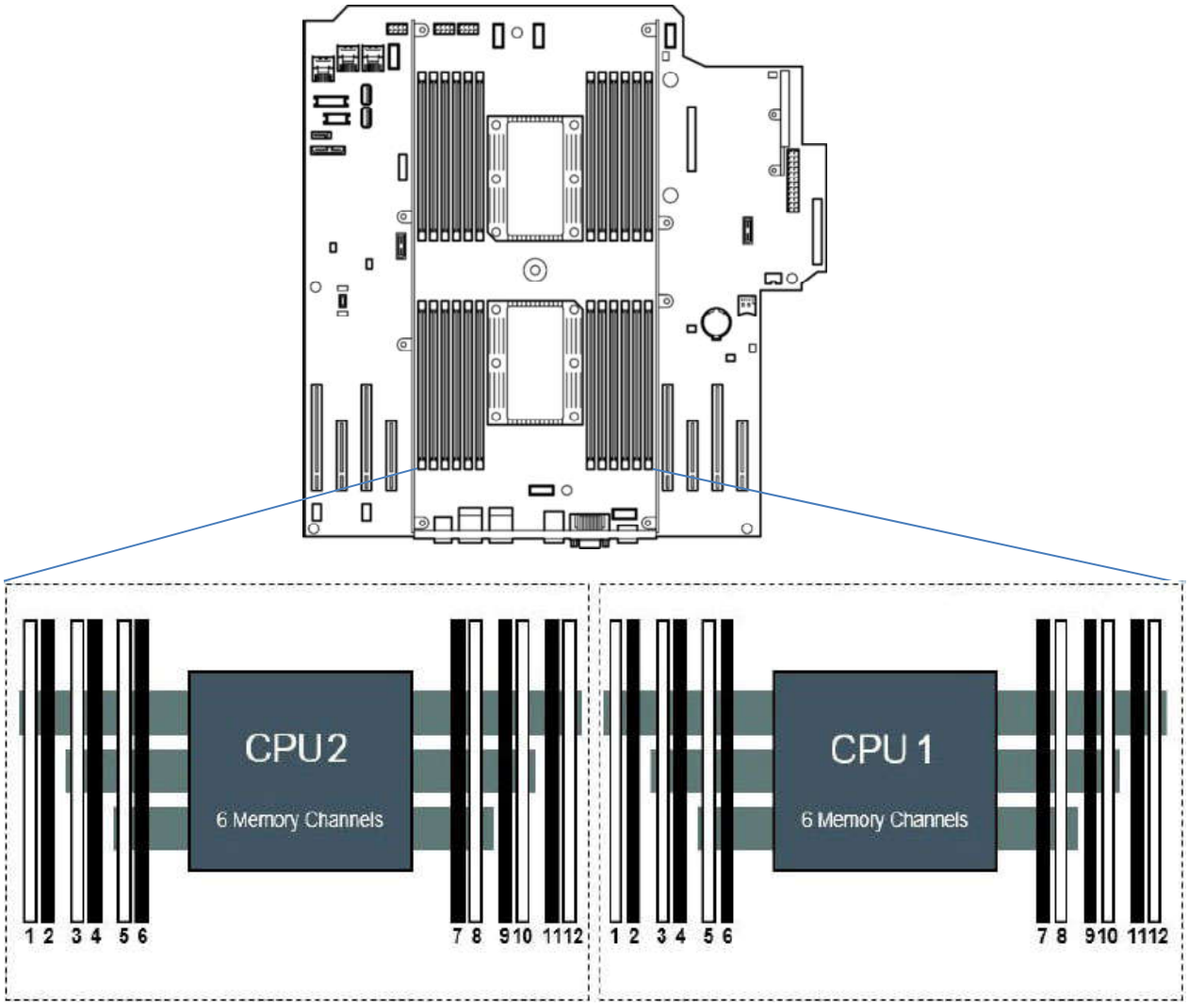
Tips

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 the same type number of DIMMs 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 types of 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.
- Only Intel Xeon Processor Gold 5100 series/Gold 6100 series/Platinum 8100 series can support Partial Mirror.

Notes for the configuration 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, POST's "Advanced Memory Protection Mode:" is displayed "Advanced ECC."

IML also records the relevant error events.

Notes for replacements at failure

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

(2) Memory Sparing Function

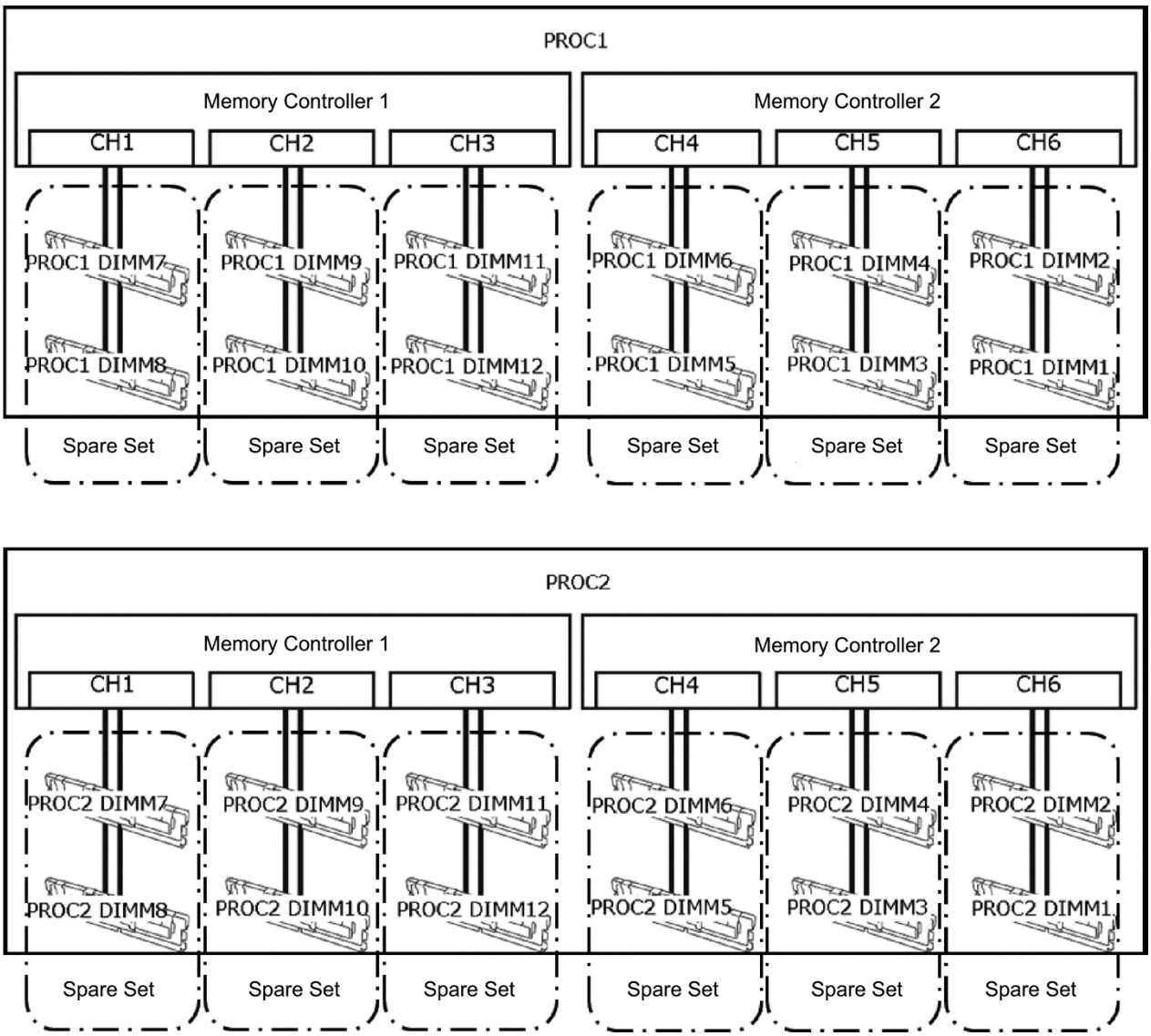
By making a rank of DIMM stored in the memory channel under a memory controller of each CPU stand by as a spare, Memory Sparing Function makes processing continue by making the DIMM standing by perform the task automatically in case a correctable error occurs in a DIMM under the memory channel in operation.

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).

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

Number of CPU	Number of memory	Types of on-board memory				
		8GB (SR)	16GB (SR)	16GB (DR)	32GB (DR)	64GB (QR)
1	8	32GB	64GB	96GB	192GB	448GB
	12	48GB	96GB	144GB	288GB	672GB
2	16	64GB	128GB	192GB	384GB	896GB
	24	96GB	192GB	288GB	576GB	1344GB



The followings are the conditions to use this function.

- Use the same type number of DIMMs for the device.
- Mount DIMMs in the DIMM socket that constitutes the 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.

Following memory sparing cannot be constructed.

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

Note

- When using Memory Sparing Function, mount 8 or 12 DIMMs per CPU.
- Use memories with the same product number for the device.

Notes for the configuration of memory sparing

Even when setting "Advanced Memory Protection" to "Online Spare with Advanced ECC Support" and designating 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, POST's "Advanced Memory Protection Mode:" is displayed "Advanced ECC."

IML also records the relevant error events.

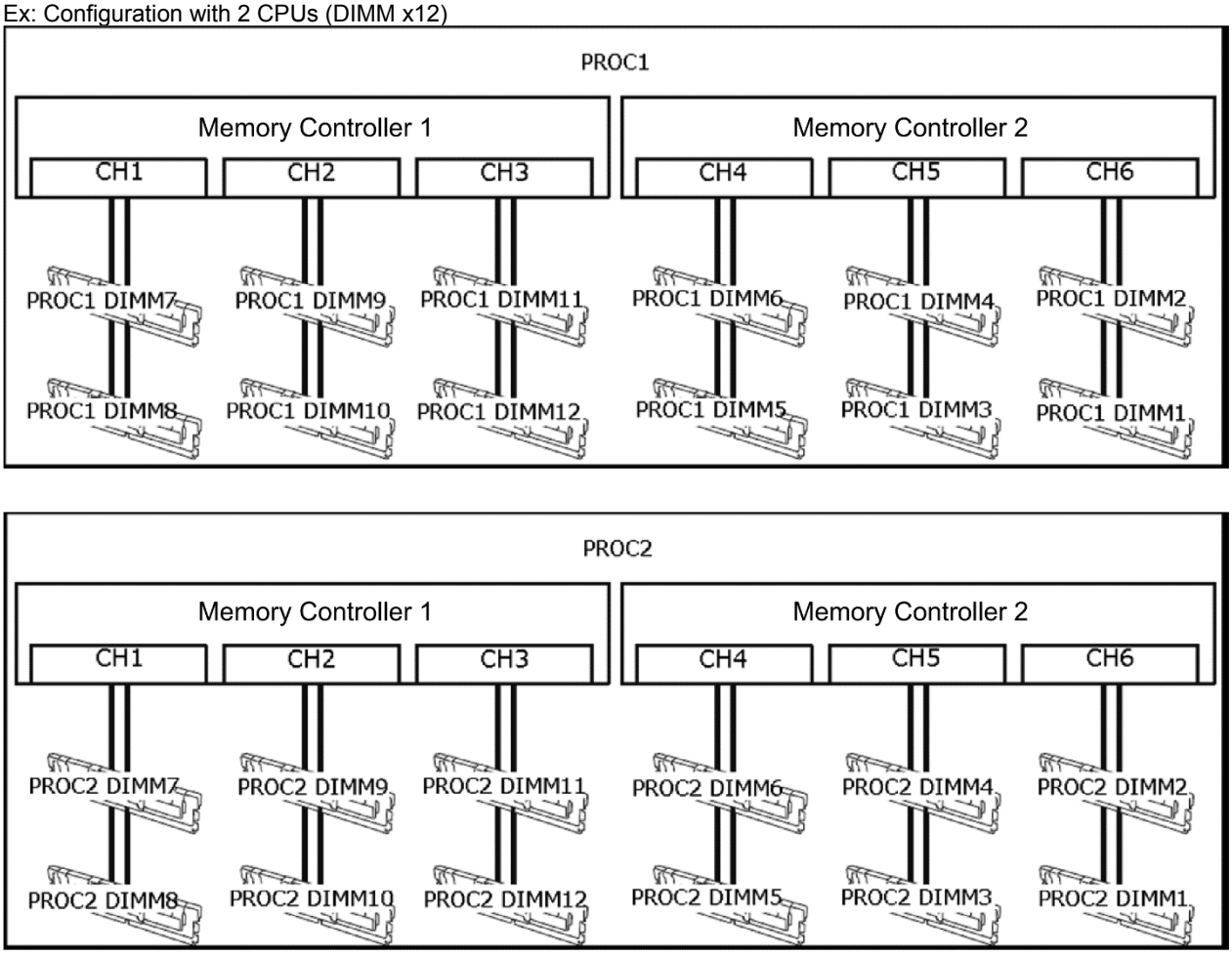
Notes for replacements at failure

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

(3) Memory ADDDC function

"Memory ADDDC function" of this device allows the correction of memory errors and continuation the operation even whilst failures occur in multiple DRAM devices on the DIMM. This provides protection against uncorrectable memory errors beyond those available in Advanced ECC.

Ex: Configuration with 2 CPUs (DIMM x12)



The conditions to use this function are described below.

- Install the DIMMs with the same model numbers to this unit.
- 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.

The memory ADDDC functions with the following features cannot be configured.

- DIMMs with the different model numbers are mounted.

Note

- To use the memory ADDDC function, mount "Eight or twelve DIMMs" per CPU.
- The DIMM compatible with the memory ADDDC function is "N8102-709", "N8102-711", and "N8102-712".
- Install the memories with the same model numbers to this unit.

Cautions for setting the memory ADDDC

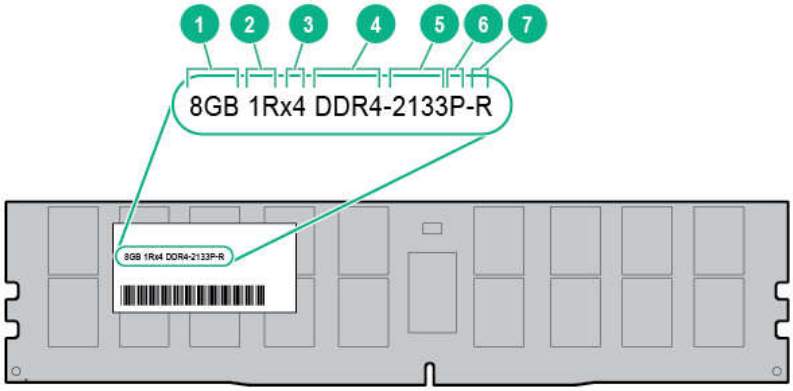
If the DIMM configuration that cannot allow the memory ADDDC configuration is detected while "Fault Tolerant Memory (ADDDC)" is set to "Advanced Memory Protection" and the memory ADDDC configuration is specified, the "Advanced ECC" setting is enabled when [Advanced Memory Protection] runs.

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.

1.11.5 Checking DIMM

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



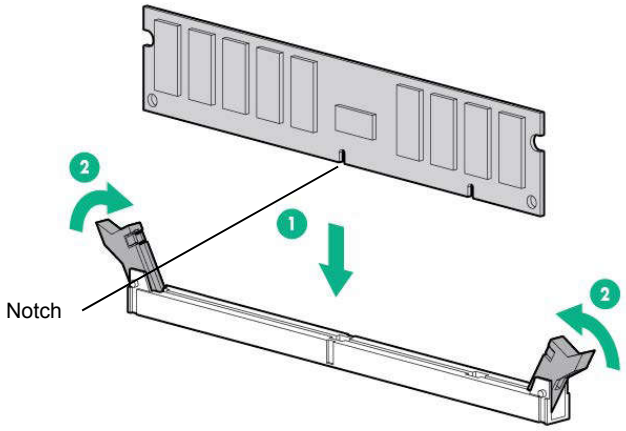
No.	Description	Meaning
1	Capacity	8GB 16GB 32GB 64GB
2	Rank	1R = Single rank 2R = Dual rank 4R = Quad rank
3	DRAM data width	X4 = 4 bit X8 = 8 bit
4	Memory generation	DDR4
5	The maximum speed of the memory	2,133 MT/s 2,400 MT/s 2,666 MT/s
6	CAS latency	P = CAS 15-15-15 T = CAS 17-17-17 U = CAS 20-18-18 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)

1.11.6 Installation

Follow the steps below to install a DIMM.

1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Open levers on left and right sides of DIMM slot.
3. 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.

4. Continue to install/remove the internal options.
5. See *Chapter 2 (1.24 Installing Side Cover)* to install the side cover.

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.

6. See *Chapter 2 (2 Installation and Connection)* to install/connect and turn the power ON.
7. Confirm that no error messages are displayed in POST screen.
8. Use System Utility to configure memory mode.

1.11.7 Replacement / Removal

Follow the procedure below to change/ remove DIMM.

To remove DIMM, reverse the installation procedure.

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

Important **Failing to install dummy cover to vacant slot may cause malfunction of the server due to insufficient cooling effect.**

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.

1.12 HDD Cage

This device supports "HDD cage" which can contain hard disk drives.

The types of HDD cage supported by the device and the mountable number of hard disk drive are as follows.

- **2.5-inch HDD cage (N8154-109)**

  This device can be equipped with one disk drive. Eight 2.5-inch drives can be equipped with.

- **3.5-inch HDD cage (N8154-108)**

  The device can be equipped with up to two disk drives. Per cage, four 3.5-inch hard disk drives can be equipped with (maximum eight when using two cages).

Note ★The device does not operate if you install a 2.5-inch HDD cage and a 3.5-inch HDD cage at the same time.★

1.12.1 Installation

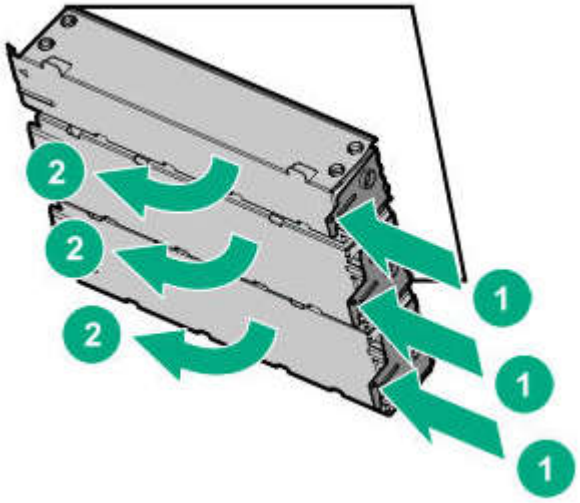
A HDD cage can be mounted on BOX1 of BOX2 of the device.

In accordance with positions to be mounted on and types of HDD cage to mount, follows the procedure below.

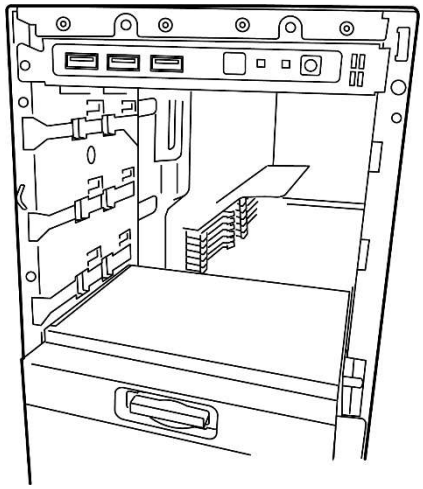
(1) 2.5-inch HDD cage

(a) Mounting on Box1

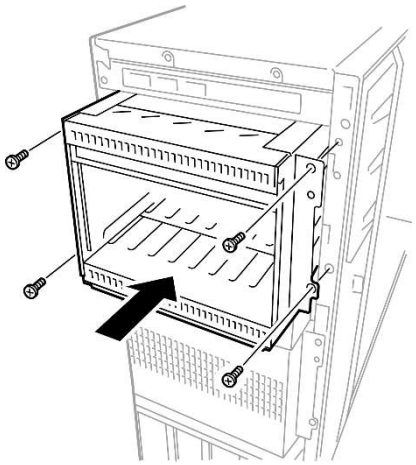
1. See steps 1 to 6 *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. While pressing the right end of latch in blank cover, pull the blank cover toward you to dismantle it.



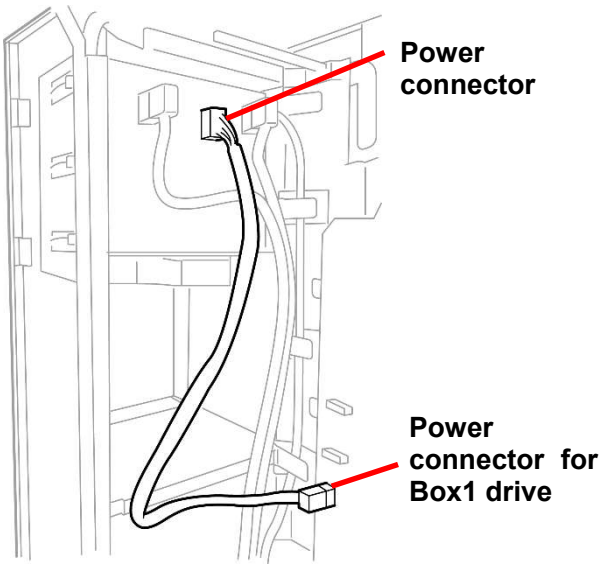
3. While keeping pulling the latch at the side, pull the blank bay toward you to dismantle it.



4. Mount the 2.5-inch HDD cage on the device and fix the four positions of cage with the screws attached to the cage.



5. With the power cable attached to the 2.5-inch HDD cage's power connector and the mother board's power connector for Box1 drive.

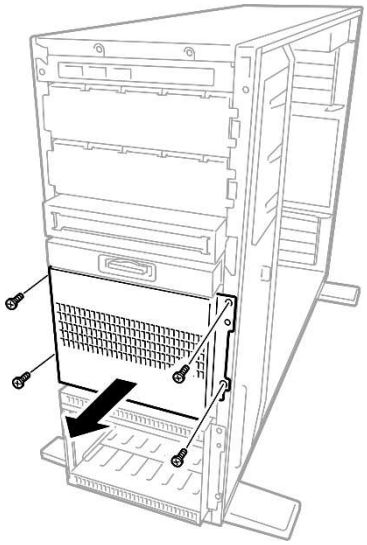


6. Connect the optional built-in SAS/SATA cable and the power cable.

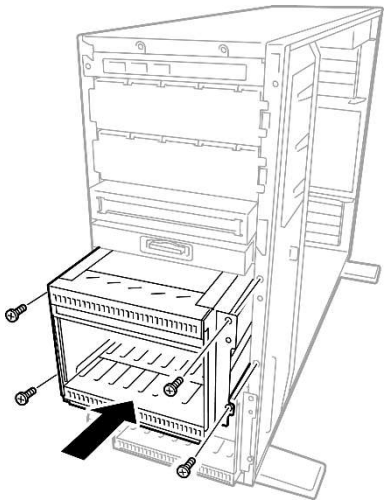
For connecting SAS/SATA cable, see *(c) Cable Route* in this manual.

(b) Mounting on Box2

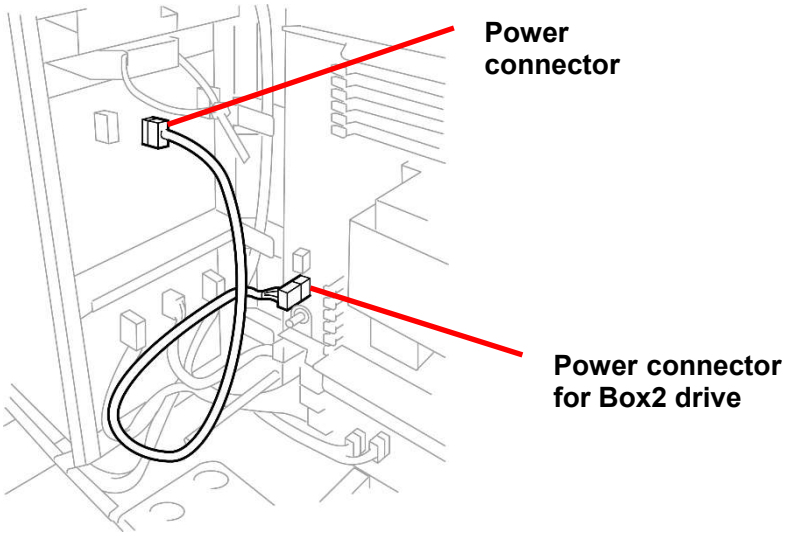
1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Unfasten four screws that secure the blank cover, and remove the blank cover.



3. Mount the 2.5-inch HDD cage on the device and fix the four positions of cage with the screws attached to the cage.



4. With the power cable attached to the 2.5-inch HDD cage, connect the 2.5-inch HDD cage's power connector and the mother board's power connector for Box2 drive.



5. Connect the optional built-in SAS/SATA cable and the power cable.

For connecting SAS/SATA cable, see *(c) Cable Route* in this manual.

(c) Cable Route

1. For connections from onboard and AROC Type-a (Example)

2. For connections only from AROC Type-a (Example)

3. For connections from PCI cards (Type-a) to each slot (Example)
(However, this is a collection of examples for installation in each slot.)

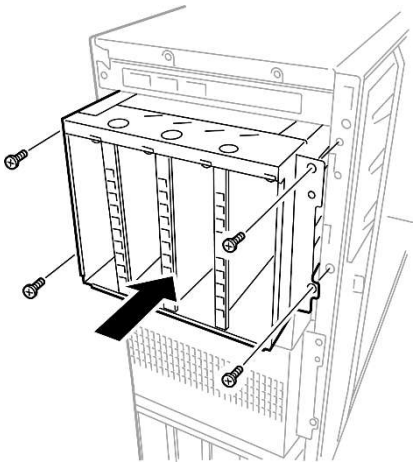
(d) Installing the side cover

1. Install the side cover of the server by referring to *Chapter 2 (Installing the side cover)*.

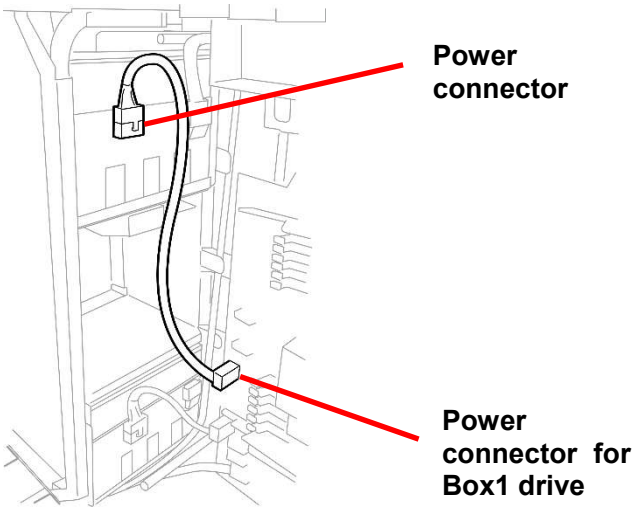
(2) 3.5-inch HDD cage

(a) Mounting on Box1

1. See steps 1 to 6 in Chapter 2 (1.2 Overview of Installation and Removal) for preparations.
2. See (1) 2.5-inch HDD cage – (a) Mounting on Box 1 to remove blank cover and blank bay.
3. Mount the 3.5-inch HDD cage on the device and fix the four positions of cage with the screws attached to the cage.



4. With the power cable attached to the 3.5-inch HDD cage, connect the 3.5-inch HDD cage's power connector and the mother board's power connector for Box1 drive.

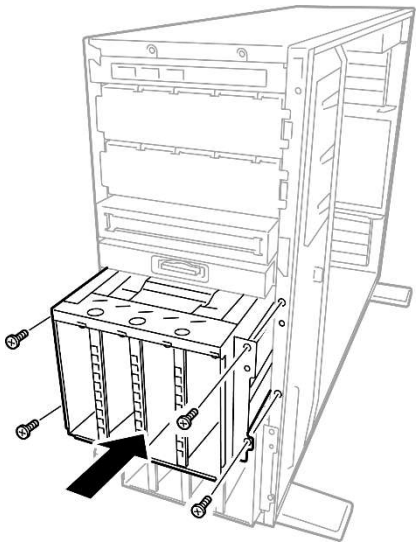


5. Connect the optional built-in SAS/SATA cable and the power cable.

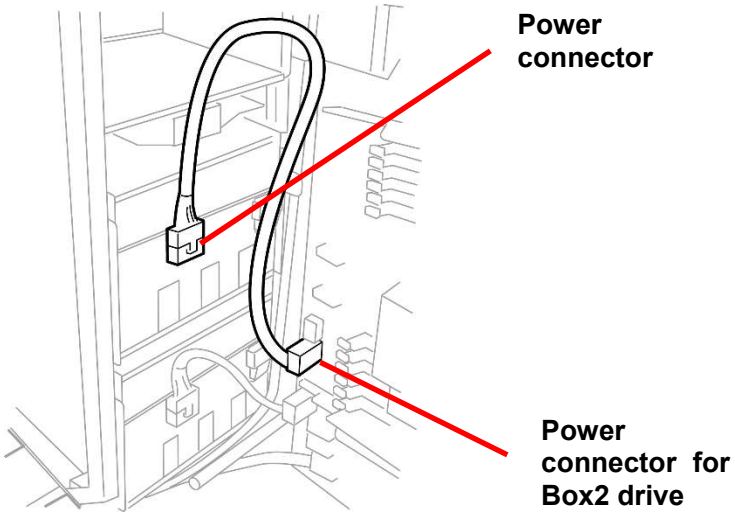
For connecting SAS/SATA cable, see *(d) Cable Route* in this manual.

(b) Mounting on Box2

1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Remove the blank cover referring to "(1) 2.5-inch HDD cage" - "(b) Installing in the Box 2".
3. Mount the 3.5-inch HDD cage on the device and fix the four positions of cage with the screws attached to the cage.



4. With the power cable attached to the 3.5-inch HDD cage, connect the 3.5-inch HDD cage's power connector and the mother board's power connector for Box2 drive.

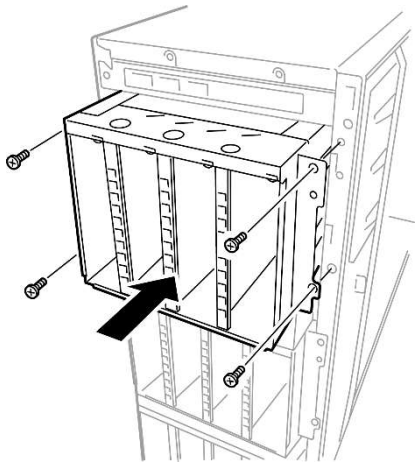


5. Connect the optional built-in SAS/SATA cable and the power cable.

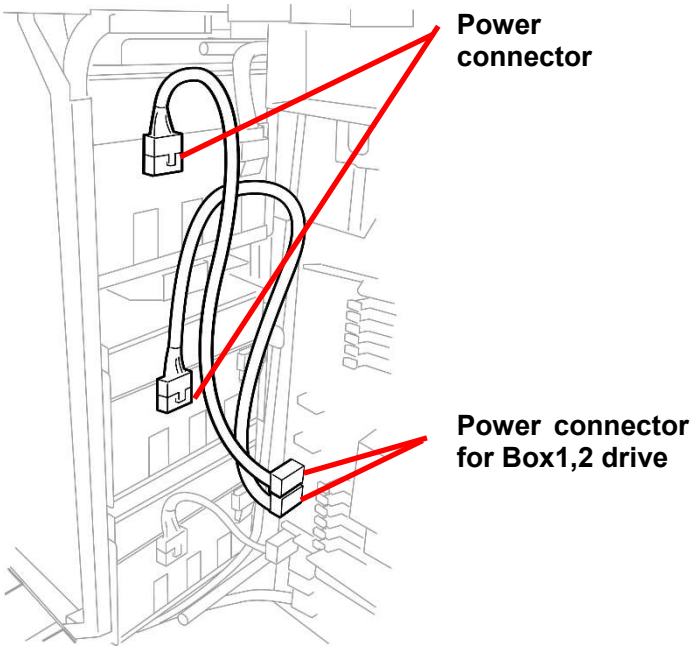
For connecting SAS/SATA cable, see *(d) Cable Route* in this manual.

(c) Mounting on Box1 and Box2

1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Remove the blank covers of the Box 1 and 2 referring to "(1) 2.5-inch HDD cage" - "(a) Installing in the Box 1" and "(b) Installing in the Box 2".
3. Mount the 3.5-inch HDD cages on the Box1 and Box2 of the server and fix the four positions of each cage with the screws attached to the cage.



4. With the power cable attached to the 3.5-inch HDD cage, connect the 3.5-inch HDD cage's power connector and the motherboard's power connector for Box1 drive.



5. Connect the optional built-in SAS/SATA cable and the power cable.

For connecting SAS/SATA cable, see *(d) Cable Route* in this manual.

(d) Cable Route

1. For onboard connections (Example)

2. For connections from onboard and AROC Type-a (Example)

3. For connections from onboard and PCI cards (Type-p) (Example)

4. For connections only from AROC Type-a (Example)

5. For connections from PCI cards (Type-p) to each slot (Example)

   (However, this is a collection of examples for installation in each slot.)

(e) Installing Side Cover

See *Chapter 2 (1.24 Installing Side Cover)* to install the side cover.

1.12.2 Removal

To remove the HDD cage, follow the steps below.

If multiple HDD cages are installed, remove HDD cage in the lower Box first.

(1) 2.5-inch HDD cage

1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Remove the hard disk drive installed in the 2.5-inch HDD cage.
3. Remove SAS/SATA cable and power cable.
4. Unfasten four screws that are securing the 2.5-inch HDD cage.
5. Pull the 2.5-inch HDD cage out of the unit.
6. If the unit is operated with the 2.5-inch HDD cage removed, attach the blank cover with screws.
7. See *Chapter 2 (1.24 Installing Side Cover)* to attach the side cover of the server.

Important **For maintaining the cooling effect, the blank cover should be attached.**

(2) 3.5-inch HDD cage

1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Remove the hard disk drive installed in the 3.5-inch HDD cage.
3. Remove SAS/SATA cable and power cable.
4. Unfasten four screws that are securing the 3.5-inch HDD cage.
5. Pull the 3.5-inch HDD cage out of the unit.
6. If the unit is operated with the 3.5-inch HDD cage removed, attach the blank cover with screws.
7. See *Chapter 2 (1.24 Installing Side Cover)* to attach the side cover of the server.

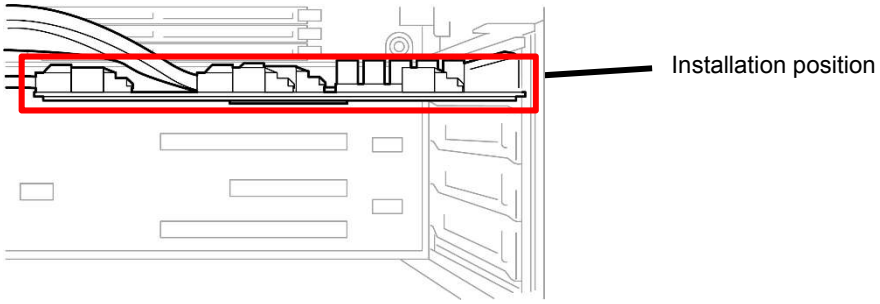
Important **For maintaining the cooling effect, the blank cover should be attached.**

When installing another HDD cage, two guides must be removed.

1.13 SAS Expander Card

This server supports SAS expander card (N8116-83).

SAS expander card should be installed on the PCI slot 4.



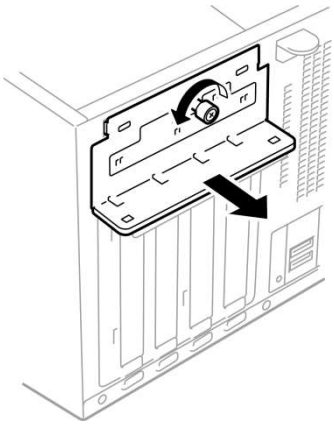
1.13.1 Installing SAS expander card

Please prepare the following before installing the option.

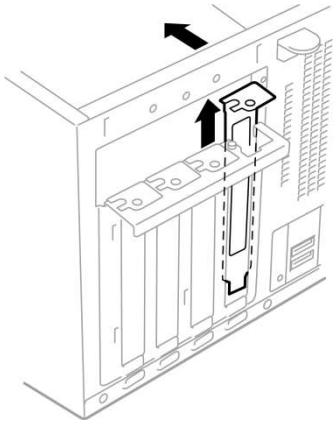
- Parts included in the option kit (SAS expander card, 5 cables)
- T-15 hexalobular driver

To install the components, follow these steps.

1. Back up all the data on the server.
2. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
3. Unfasten the bracket hand screws that secure the blank cover, and remove the brackets.



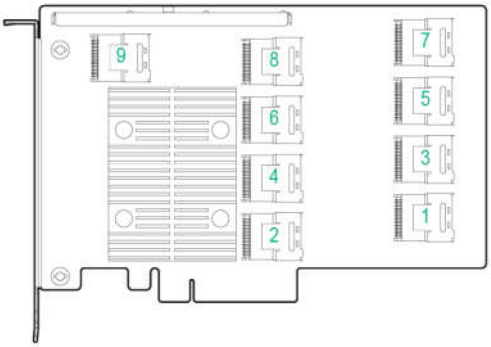
4. Lift straight up the blank cover on the slot where the PCI board will be installed, and remove it.

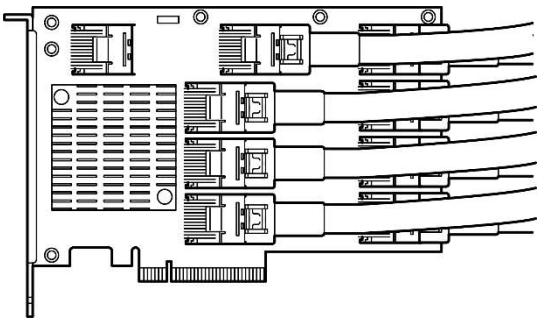


5. Connect the cables according to the table below.

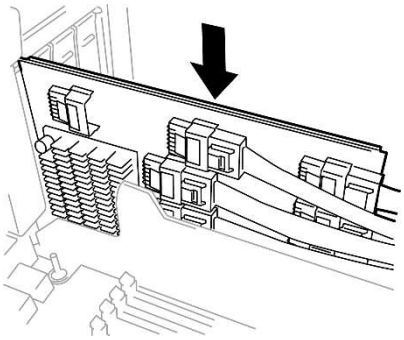
SAS expander card	Where to connect
PORT1	RAID dedicated slot PCI card output(PORT1,2)
PORT2	
PORT3 PORT4	HDD cage Box3(PORT1) (PORT2)
PORT5 PORT6	HDD cage Box2(PORT1) (PORT2)
PORT7 PORT8	HDD cage Box1(PORT1) (PORT2)

Attach the cable by checking the description at both ends of the cable.

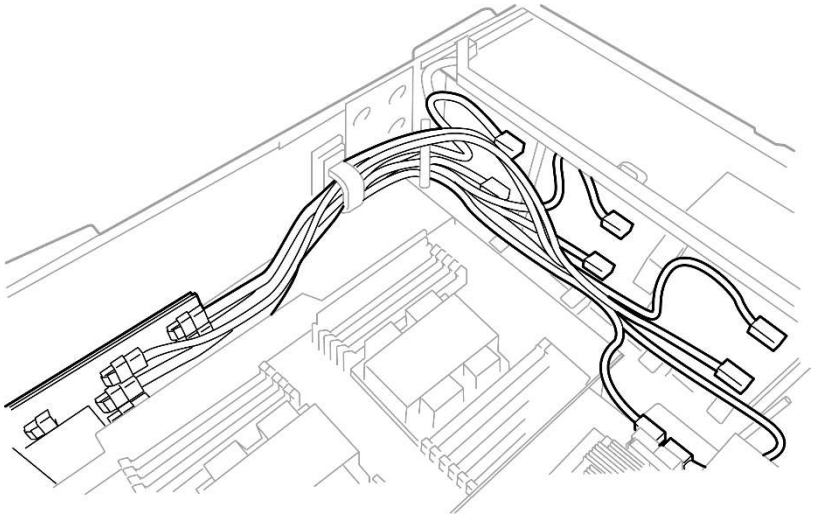




Align the PCI slot with the PCI board terminal, and insert them securely.



6. Install the HDD cage and cables referring to "HDD cage" described in this manual.



Cable routes are as follows.

(a) For connections from AROC Type-a (Example)

(b) For connections from PCI card (Type-p)

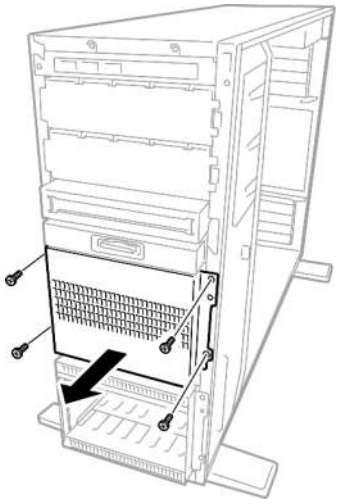
7. See *Chapter 2 (1.24 Installing Side Cover)* to attach the side cover of the server.

1.14 NVMe (To be released in January 2018)

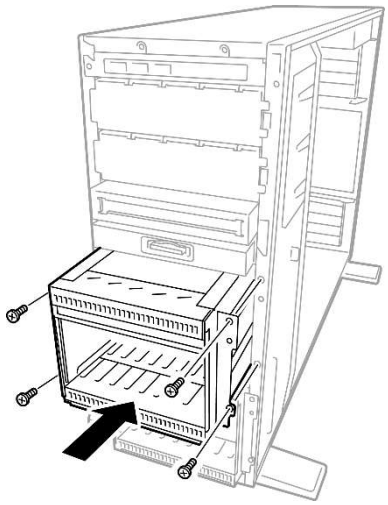
To use NVMe storage device with the unit, follow the steps below to install NVMe cage and connect interface cards and cables.

1.14.1 Installation

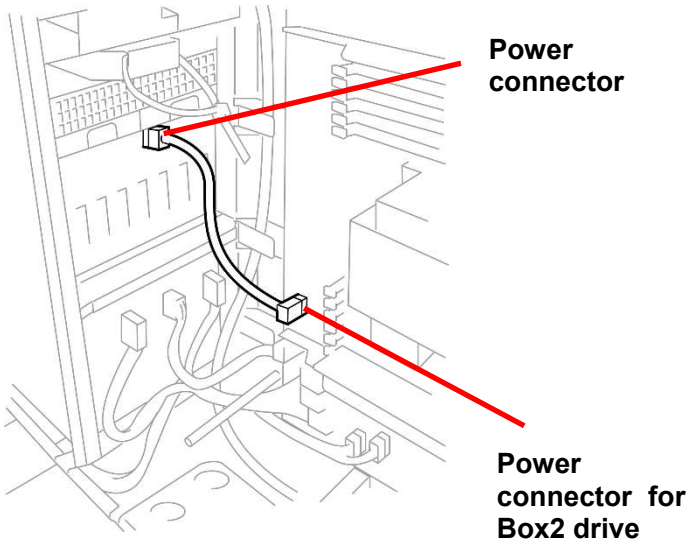
1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Unfasten four screws that secure the blank cover, and remove the blank cover.



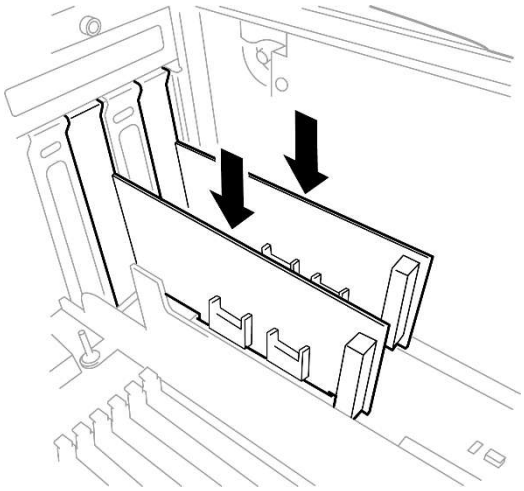
3. Install NVMe cage to the unit, and secure four screws that are included with the cage.



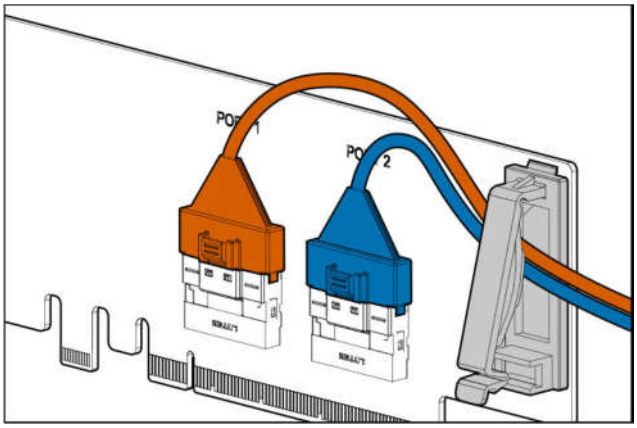
4. Connect the power connector of NVMe cage with the power connector for the Box 2 drive on the motherboard, using power cable that is included with NVMe cage.

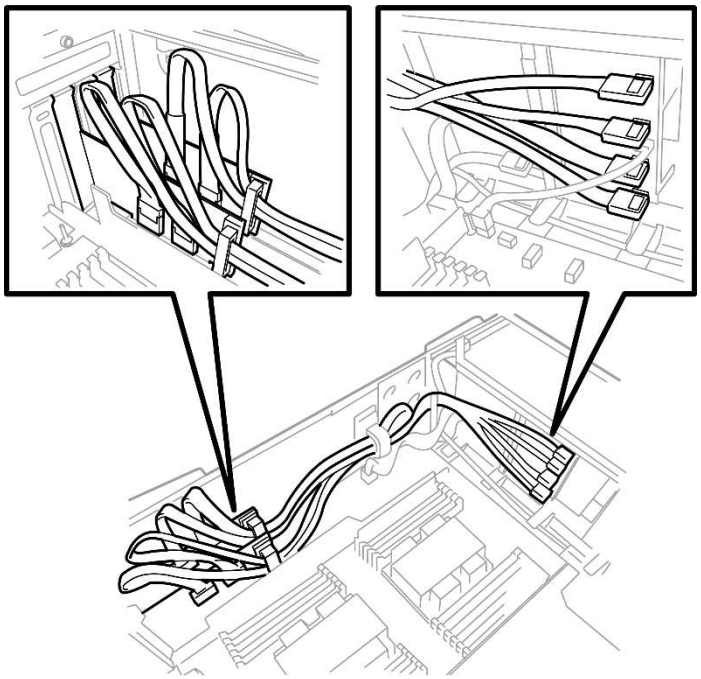


5. Install NVMe riser card in PCIe slot 1 and 3 referring to "1.15; PCI Board".



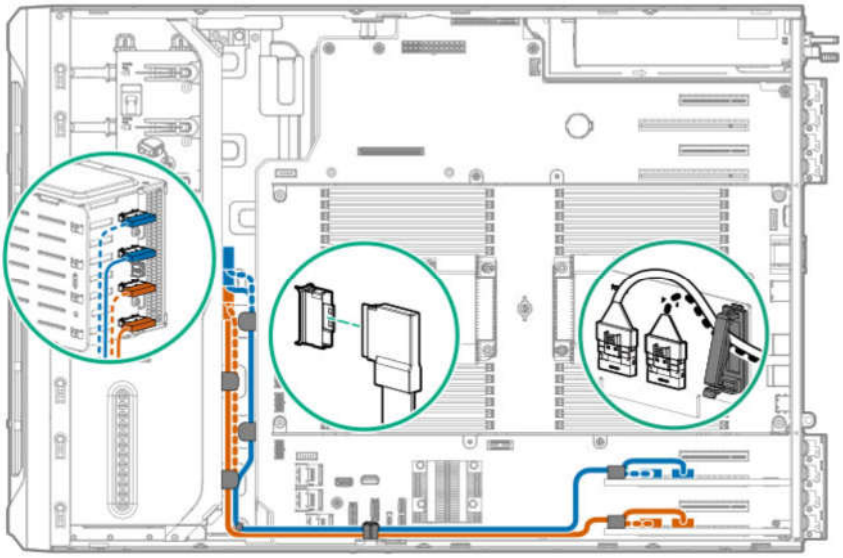
6. Connect NVMe riser card to NVMe cage with the cable.



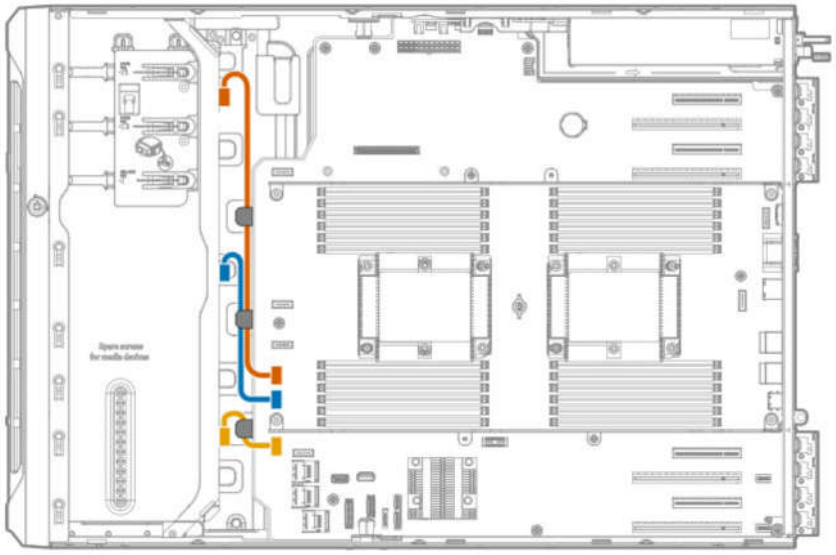


Cable routes are as follows.

(a) Signal Cable



(b) Power Cable



7. See *Chapter 2 (1.24 Installing Side Cover)* to attach the side cover of the server.

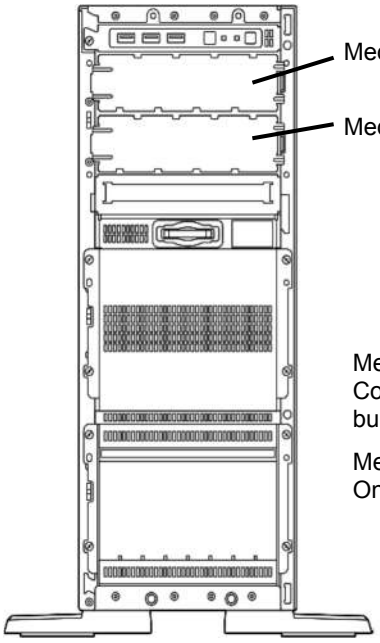
1.15 Backup Device

Built-in LTO (N8151-141/142/143) and built-in RDX (N8151-139) backup devices can be installed in the media bay.

Important

- **To avoid static electricity, see *Chapter 1 (1.8 Anti-static Measures)* in Safety Precautions and Regulatory Notices.**
- **Do not install a 5.25 type device that is not supported.**

1.15.1 Mounting Position



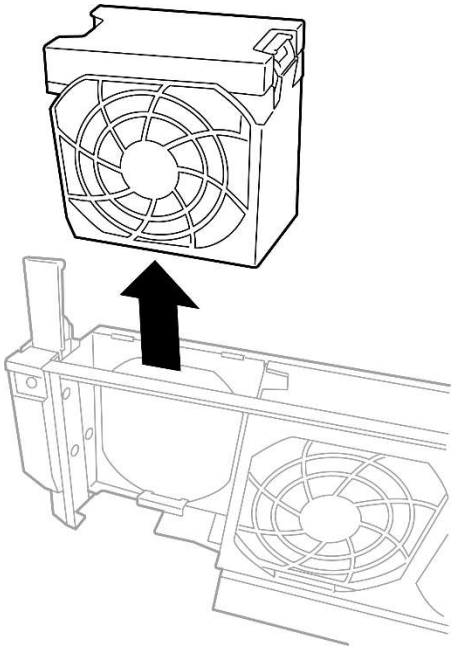
Media Bay 1
Compatible with built-in LTO(N8151-141/142/143) or built-in RDX (N8151-139)

Media Bay 2
Only compatible with built-in RDX (N8151-139)

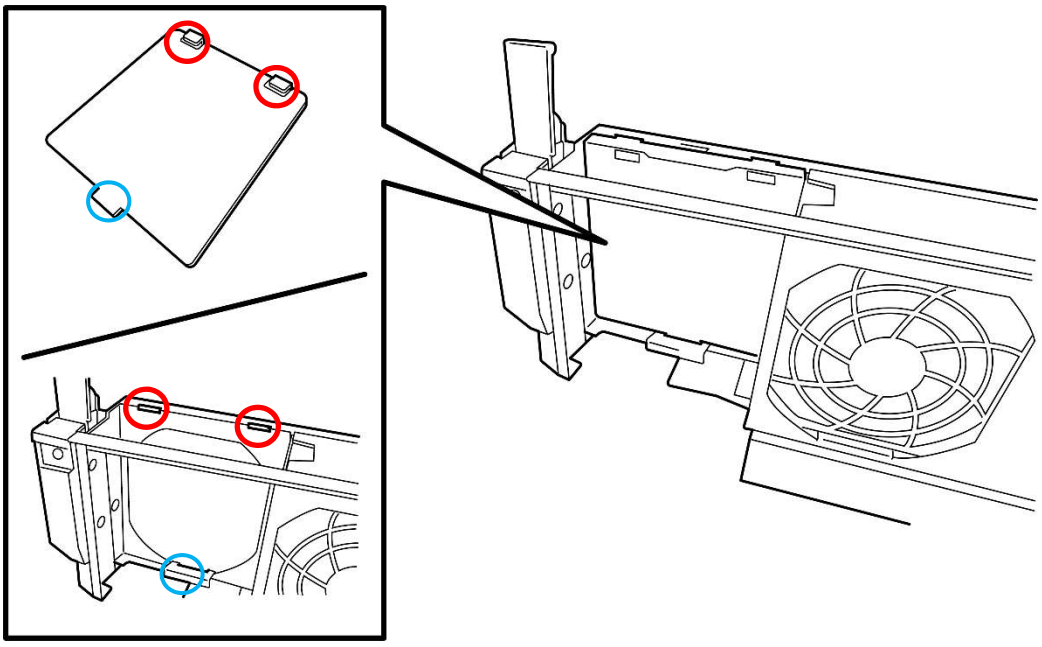
1.15.2 Preparation before installation

Before installing RDX/LTO device, remove the fan mounted in fan bay 1 of the Redundant fan kit and then install the FAN Blank.

1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Remove the fan bay of the redundant fan kit.
3. Remove the fan mounted in fan bay 1.



4. Install the Fan Blank in fan bay 1.
   Install the Fan Blank as its protrusions are fitted into three holes of the fan bay.



1.15.3 Installing RDX device

Note

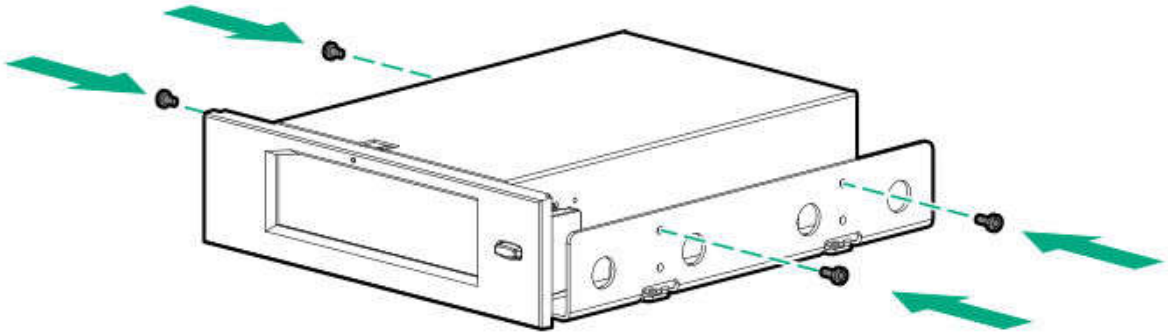
In order to prevent the damage to electronic components, please start to install the system after conducting the appropriate anti-static treatment. There is a possibility of causing electrostatic discharge if appropriate grounding wire treatment is not conducted.

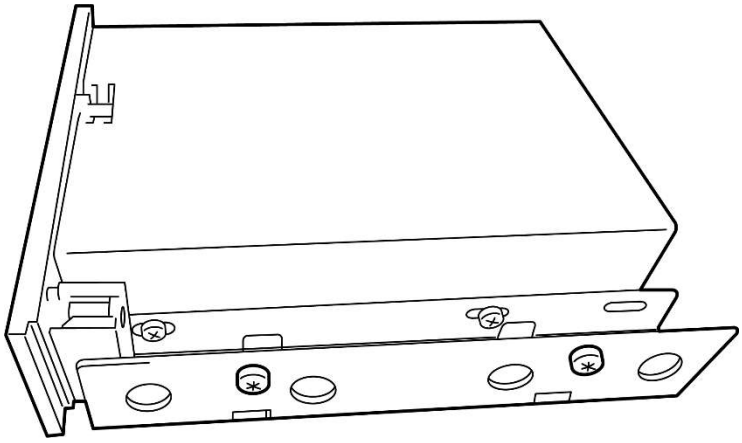
Please prepare the following before installing the option.

- Parts included in the option kit
- T-15 hexalobular driver

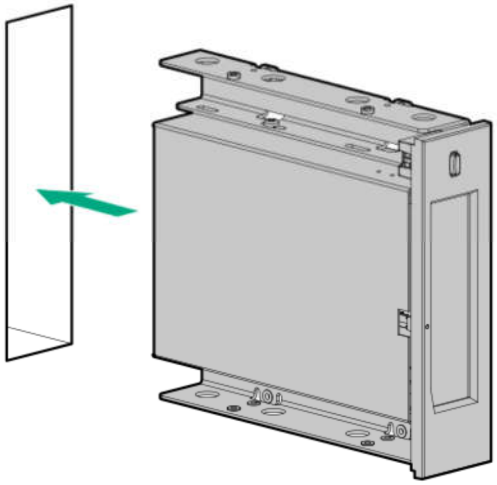
To install the components, follow these steps.

1. Attach supplied screws in four points on both the left and right sides of RDX device, and tighten screws with the T-15 hexalobular screwdriver.

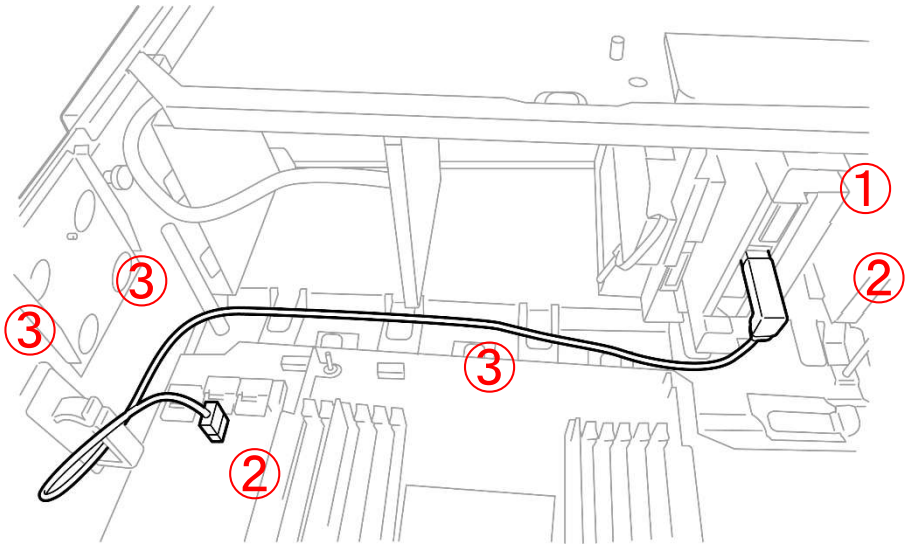




2. Install RDX device in the media bay.

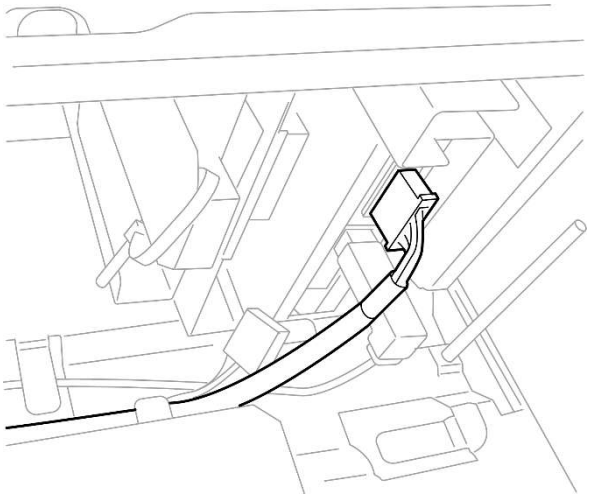


3. Connect USB 3.0 connector on the motherboard to USB 3.0 connector of RDX device with the supplied cable.
4. Organize the cables using the cable guide etc. of the main unit.

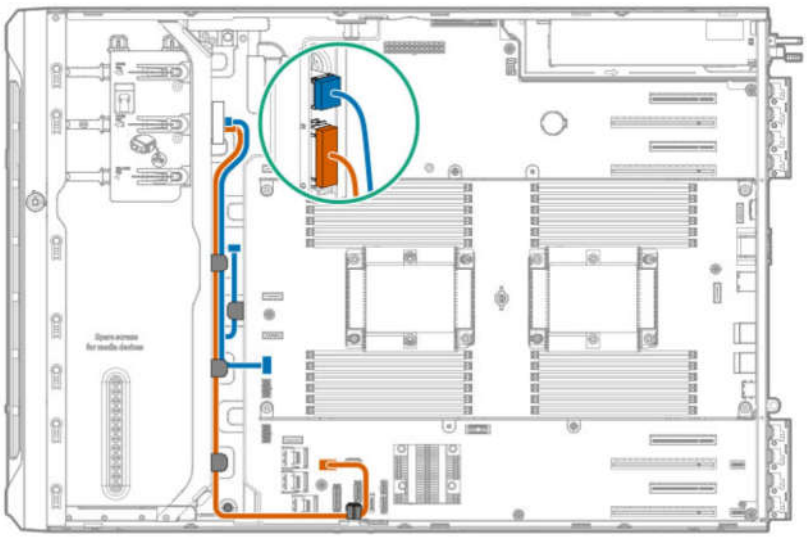


5. Connect "BOX 1" connector on the motherboard to power connector of RDX device with the supplied power cable.

6. Organize the cables using the cable guide etc. of the main unit.
   Install the fan bay of the Redundant fan kit to the main unit.



Cable routes are as follows.



7. See *Chapter 2 (1.24 Installing Side Cover)* to attach the side cover of the server.

1.15.4 Installing LTO device

Note

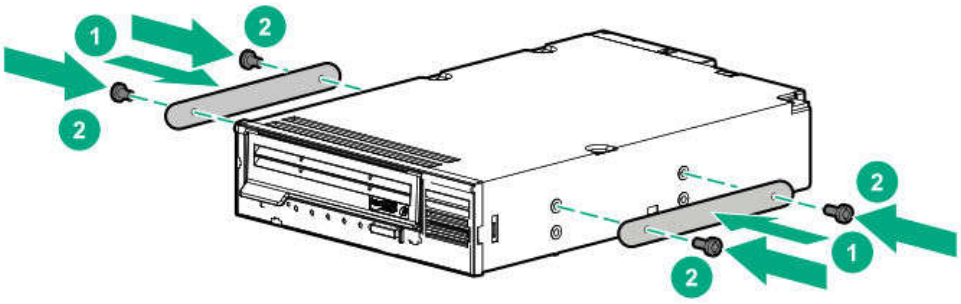
In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

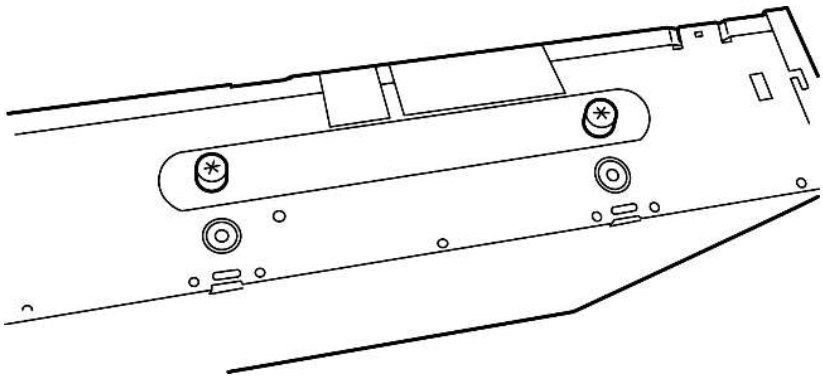
Please prepare the following before installing the option.

- Parts included in the option kit
- T-15 hexalobular driver
- Cable

To install the components, follow these steps.

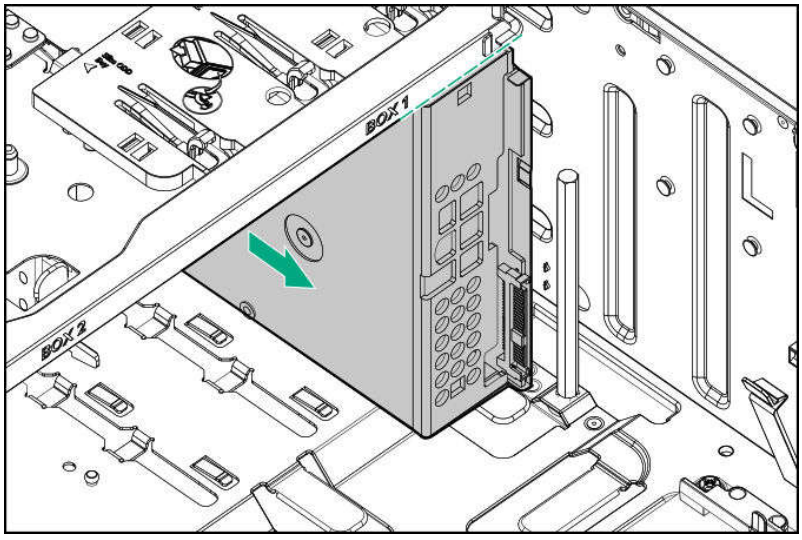
1. Install the shims on the both sides of LTO device, and secure them by tightening screws with the T-15 Hexalobular screwdriver.
   To install the shim, check also the manual attached to LTO device.



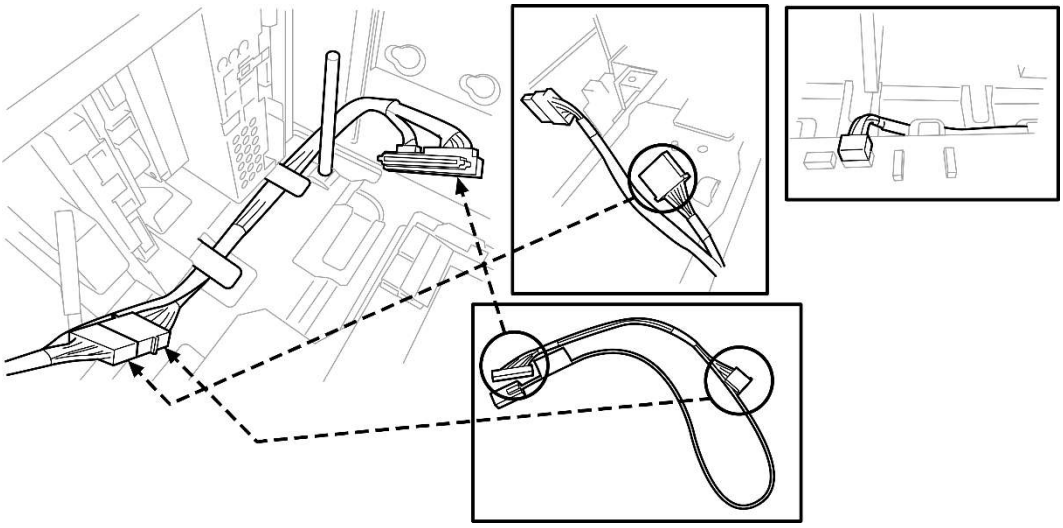


2. Install LTO device in the media bay.

   For easier cable installation, do not allow LTO device to be placed beyond the rear end of the front end cage.

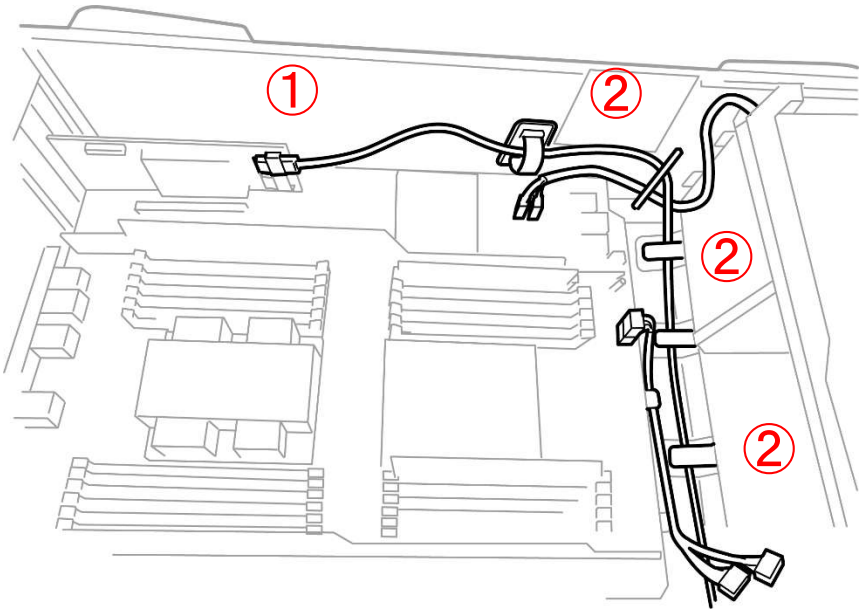


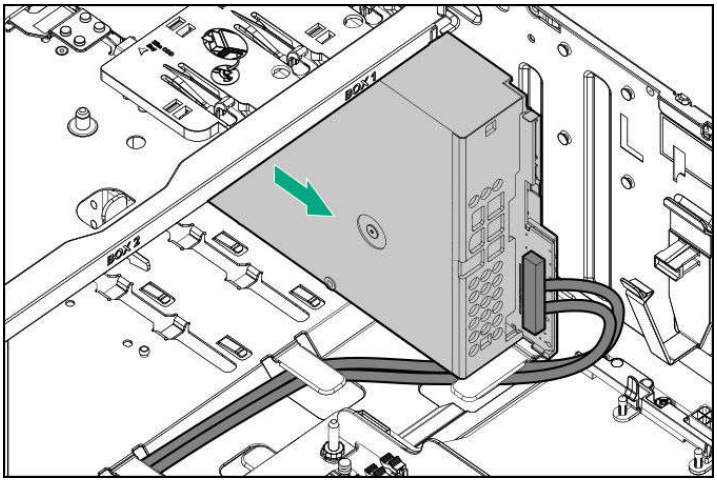
3. Place the supplied cable around the cable pillar.
4. Connect the connector of the signal/power cable to LTO device.
5. Connect the power connector of the signal/power cable to the power cable.
6. Connect the power cable to the motherboard.
7. Organize the cables using the cable guide etc. of the main unit.



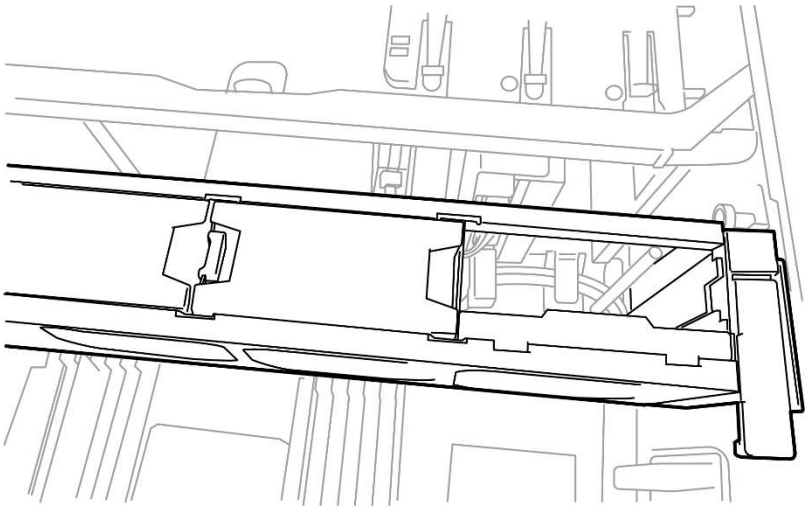
8. Connect the signal connector of the signal/power cable to the expander card.

9. Adjust cable wiring.





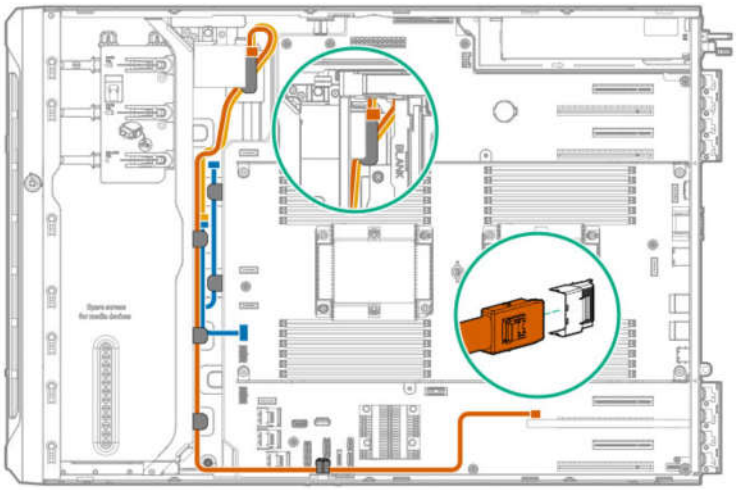
10. Install the fan bay of the redundant fan kit to the main unit.



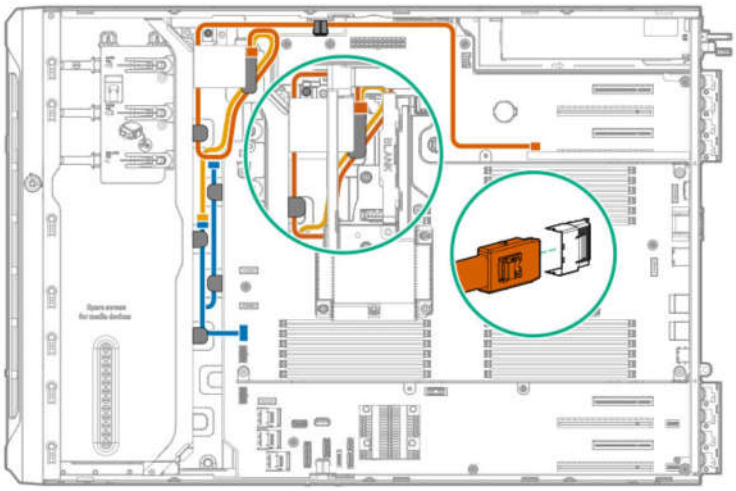
11. See *Chapter 2 (1.24 Installing Side Cover)* to attach the side cover of the server.

Cable routes are as follows.

(a) When slot 3 card is installed



(b) When slot 5 card is installed



1.15.5 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.**

1.16 PCI Card

This server has a total of 8 slots where the PCI card can be installed; which includes four slots for PCI Express x16 and also four slots for PCI Express x8. Thus, a maximum of 8 PCI boards (up to four cards for PCI Express x16) can be installed in the unit.

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.**

1.16.1 Notes

Read the following notes when installing or removing a PCI 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.

1.16.2 Supported PCI 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

If the operation performance of PCI card differs from that of PCI Slot, the PCI card operates at lower frequency.

(1) List of PCI card slots

(1/2)

Product number	Product name	Name	RAID	PCI slot								Remarks
		Slot number	—	PCI1	PCI2	PCI3	PCI4	PCI5	PCI6	PCI7	PCI8	
		Connected CPU	CPU1				PCH	CPU2				
		PCI standard	PCIe3.0									
		PCI slot performance *1	x8	x16	x4	x16	x4	x16	x8	x16	x8	
		Bandwidth/lane *1	8Gb/s									
		PCI card type *2	—	x16	x8	x16	x8	x16	x8	x16	x8	
		Slot size	Dedi	FH								
		Available size	cated to RAID									
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)]		○	—	—	—	—	—	—	—	—	*3
N8103-191	RAID Controller (4GB,RAID 0/1/5/6) [PCI Express 3.0(x8)]		○	—	—	—	—	—	—	—	—	*3
N8103-195	RAID/SAS Controller (0MB,RAID 0/1) [PCI Express 3.0(x8)]		—	2	7	1	8	5	4	6	3	
N8103-201	RAID Controller (2GB,RAID 0/1/5/6) [PCI Express 3.0(x8)]		—	2	7	1	8	5	4	6	3	*3
N8103-196	RAID Controller (4GB,RAID 0/1/5/6) [PCI Express 3.0(x8)]		—	2	7	1	8	5	4	6	3	*3 *4
N8103-197	SAS Controller (2ch) [PCI Express 3.0(x8)]		—	2	7	1	8	5	4	6	3	
N8104-178	Dual Port 1000BASE-T Adapter [PCI Express 2.0(x1)]		—	4	1	5	8	6	2	7	3	
N8104-179	Quad Port 1000BASE-T Adapter [PCI Express 2.0(x4)]		—	4	1	5	8	6	2	7	3	*5
N8104-180	Dual Port 1000BASE-T Adapter [PCI Express 2.0(x4)]		—	4	1	5	8	6	2	7	3	*5
N8104-181	Quad Port 1000BASE-T Adapter [PCI Express 2.0(x4)]		—	4	1	5	8	6	2	7	3	*5

(2/2)

Product number	Product name	Name	RAID	PCI slot								Remarks
		Slot number		PCI1	PCI2	PCI3	PCI4	PCI5	PCI6	PCI7	PCI8	
		Connected CPU		CPU1			PCH	CPU2				
		PCI standard		PCIe3.0								
		PCI slot performance*1	x8	x16	x4	x16	x4	x16	x8	x16	x8	
		Bandwidth/lane*1		8Gb/s								
		PCI card type *2	—	x16	x8	x16	x8	x16	x8	x16	x8	
		Slot size	Dedi	FH								
		Available size	cated to RAID									
N8104-182	Dual Port 10GBASE-T Adapter [PCI Express 2.0(x8)]		—	2	7	1	8	5	4	6	3	
N8104-183	Dual Port 10GBASE-T Adapter [PCI Express 3.0(x8)]		—	2	7	1	8	5	4	6	3	
N8104-184	Dual Port 10GBASE-T Adapter [PCI Express 3.0(x4)]		—	4	1	5	8	6	2	7	3	
N8104-185	Dual Port 10GBASE SFP+ Adapter [PCI Express 2.0(x8)]		—	2	7	1	8	5	4	6	3	
N8104-186	Dual Port 10GBASE SFP+ Adapter [PCI Express 3.0(x8)]		—	2	7	1	8	5	4	6	3	
N8104-187	Dual Port 25GBASE SFP28 Adapter [PCI Express 3.0(x8)]		—	2	7	1	8	5	4	6	3	
N8104-188	Quad Port 25GBASE QSFP28 Adapter [PCI Express 3.0(x16)]		—	4	—	3	—	2	—	1	—	
N8190-163	Fibre Channel Controller (1ch) [PCI Express 3.0(x8)]		—	2	7	1	8	5	4	6	3	
N8190-164	Fibre Channel Controller (2ch) [PCI Express 3.0(x8)]		—	2	7	1	8	5	4	6	3	
N8190-165	Fibre Channel Controller (1ch) [PCI Express 3.0(x8)]		—	2	7	1	8	5	4	6	3	
N8190-166	Fibre Channel Controller (2ch) [PCI Express 3.0(x8)]		—	2	7	1	8	5	4	6	3	
N8190-171	Fibre Channel Controller(1ch) [PCI Express 3.0(x8)]		—	2	7	1	8	5	4	6	3	
N8190-172	Fibre Channel Controller (2ch) [PCI Express 3.0(x8)]		—	2	7	1	8	5	4	6	3	
N8116-83	SAS Expander card [PCI Express (x8)]		—	—	—	—	○	—	—	—	—	
N8118-321	2.5-inch PCIe SSD installation kit [PCI Express 3.0(x16)]		—	1	—	2	—	—	—	—	—	*6
N8118-312	M.2 SATA SSD installation kit [PCI Express (x8)]		—	2	—	1	—	—	—	—	—	

● Installed as standard ○ 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 installed. x16 card cannot be installed.

・Refer to the technical guide for the detailed feature of each card.
・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.
・In case the performances are different between a PCI slot and a PCI board, the device operates on the lower performance.
FH: Full height
*3 A maximum of 1 battery can be implemented per device
*4 For external devices
*5 Cable with boots is not supported
*6 The 2.5-inch PCIe SSD installation kit includes two riser cards.

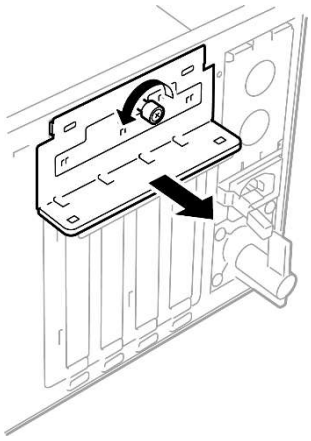
1.16.3 Installing PCI card

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.

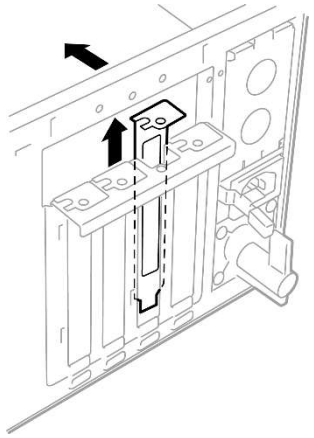
Follow these steps.

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. Unfasten the bracket hand screws that secure the blank cover, and remove the brackets.

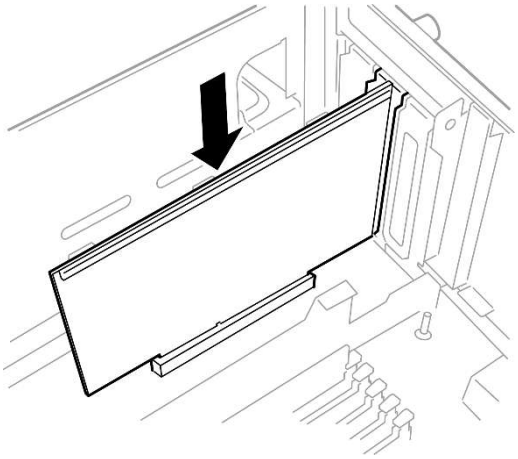


4. Check the slot where the PCI board should be installed, referring to the table in "Supported PCI Boards and Installable Slots."

5. Lift straight up the blank cover on the slot where the PCI board will be installed, and remove it.



6. Fit the PCI slot to PCI card terminal, then insert the terminal into the connector firmly.



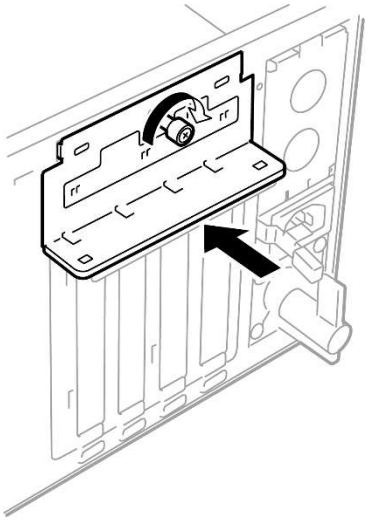
Important **Do not touch the terminal part of riser card or PCI card and the signal pins of electric parts installed on the board. Installing boards with dirt or oil can cause malfunction.**

Note

- Make sure that the edge of a PCI card bracket is seated into the fixed slot of the riser card.
- 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.

7. Connect the required internal and external cables to the PCI card. Refer to the documentation that came with the PCI card.

8. Attach the bracket as in the original state where the blank cover was fixed, and tighten the hand screw until it is secured.



9. See *Chapter 2 (1.24 Installing Side Cover)* to attach the side 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. See *Chapter 2 (2 Installation and Connection)* to conduct installation and connection, and turn the power supply ON.

1.16.4 Removal

To remove a PCI card, reverse the installation procedure.

If using the server with the PCI card removed, attach the blank cover that comes with the riser card unit.

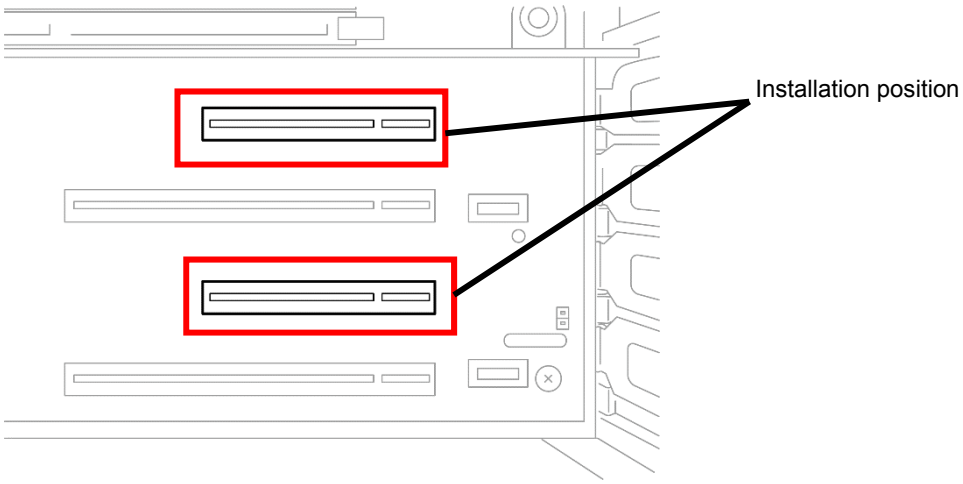
Important **Re-attach the blank cover removed to maintain the internal cooling.**

1.17 M.2 SATA SSD installation kit (N8118-312) (To be released in FY 2017)

The unit supports the M.2 SATA SSD installation kit (N8118-312), and can be equipped with two SATA RI M.2 2280 SSD modules.

PCI slot 2 or 4 is where M.2 SATA SSD installation kit should be installed.

Since they use the same SATA port as DVD drive, only one of them can be implemented.



1.17.1 Installing M.2 SATA SSD installation kit

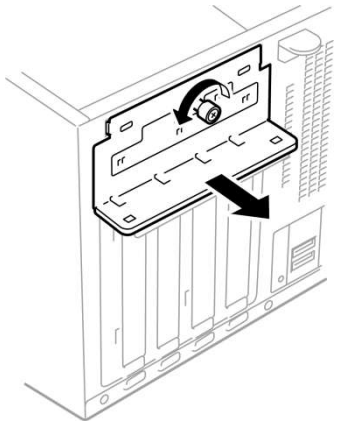
Please prepare the following before installing the option.

- Parts included in the option kit
- Screwdriver

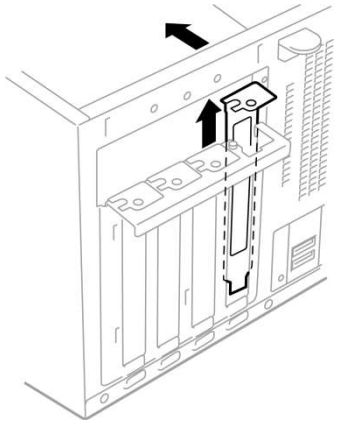
To install the components, follow these steps.

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. Remove the CPU duct and the Redundant fan kit.

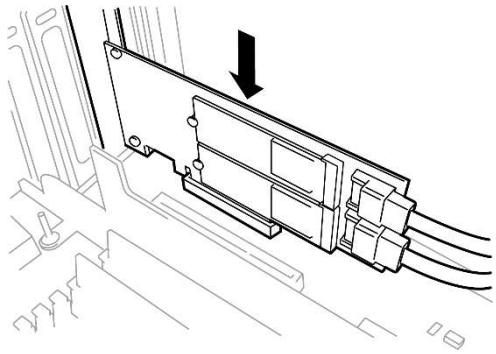
4. Unfasten the bracket hand screws that secure the blank cover, and remove the brackets.



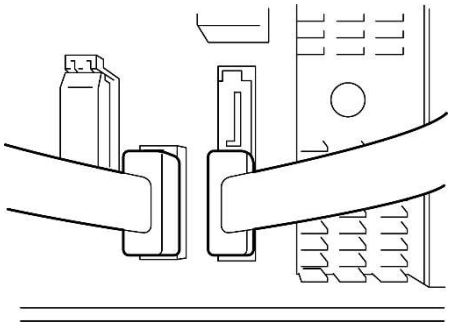
5. Lift straight up the blank cover on the slot where the PCI card should be installed.



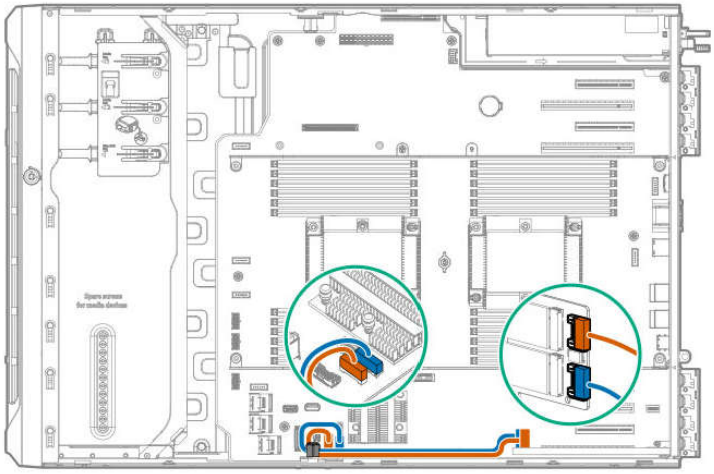
6. Install SSD module in the M.2 SATA SSD installation kit.
   (a) Insert the SSD module into the SSD slot of the M.2 SATA SSD installation kit at an angle of 45 degrees, and slowly push it down.
   (b) Secure the SSD module on the M.2 SATA SSD installation kit with screws.
   (c) To install the second SSD module, repeat the same procedure.
7. Fit the PCI slot to the PCI card terminal, then insert the terminal into the connector firmly.



8. Connect the M.2 SATA SSD installation kit to connectors of SATAPORT 4 and 5 on the motherboard with the SATA cable.



Cable routes are as follows.



9. Install the CPU duct and the Redundant fan kit.
10. See *Chapter 2 (1.24 Installing Side Cover)* to attach the side 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. See Chapter 2 (2 Installation and Connection) to conduct installation and connection, and turn the power supply ON.

1.17.2 Removal

To remove a PCI card, reverse the installation procedure.

If using the server with the PCI card removed, attach the blank cover that comes with the PCI slot.

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

1.18 RAID Controller (PCI Card Type-p)

This server supports RAID controller (PCI Card Type-p).

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

See the table for performance features.

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.

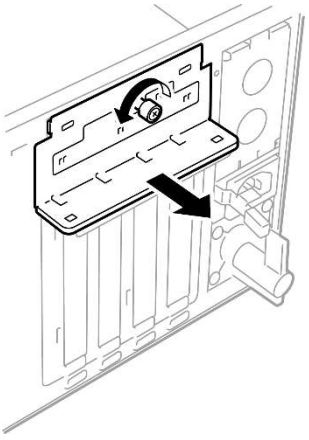
1.18.1 Installing RAID controller

Please prepare the following before installing the option.

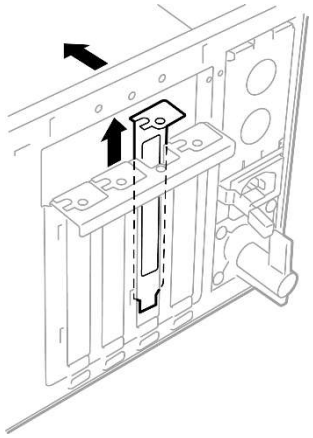
- Parts included in the option kit
- T-15 hexalobular driver

To install the components, follow these steps.

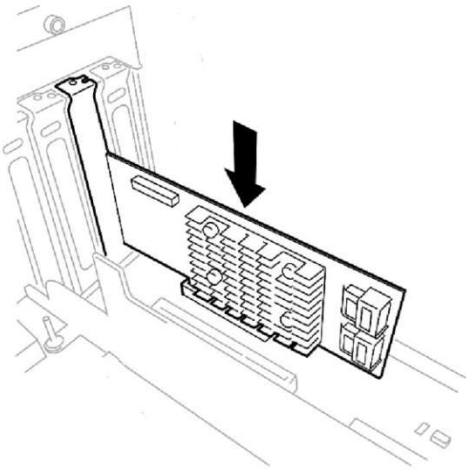
1. Back up all data in the server.
2. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
3. Unfasten the bracket hand screws that secure the blank cover, and remove the brackets.



4. Lift straight up the blank cover on the slot where the PCI board will be installed, and remove it.

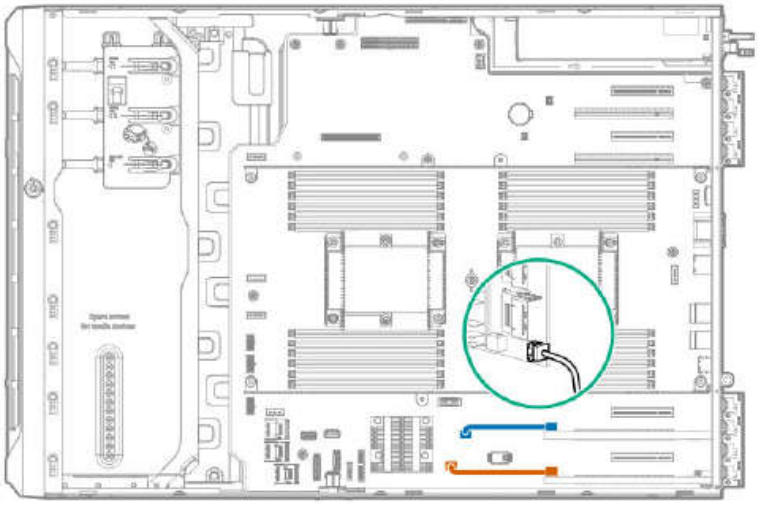


5. Align the PCI slot with the PCI board terminal, and insert them securely.

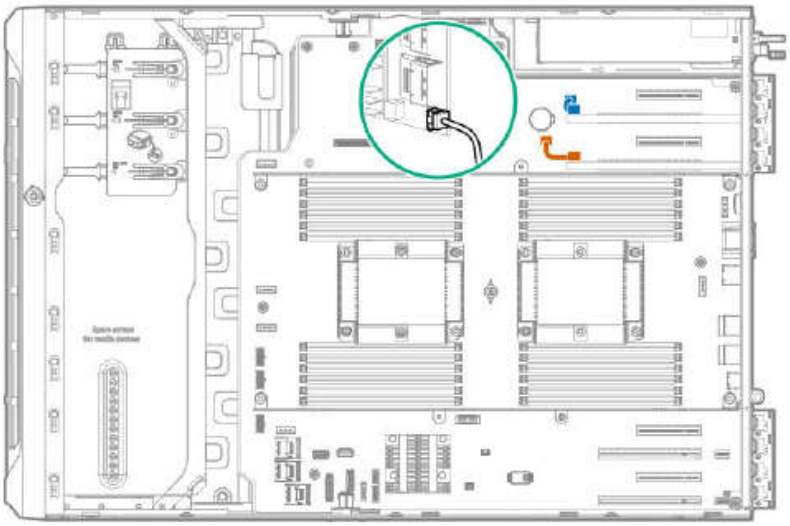


6. Connect the power cable for cache backup.

・Power cable for cache backup (when mounting to slot 1 and slot 3)

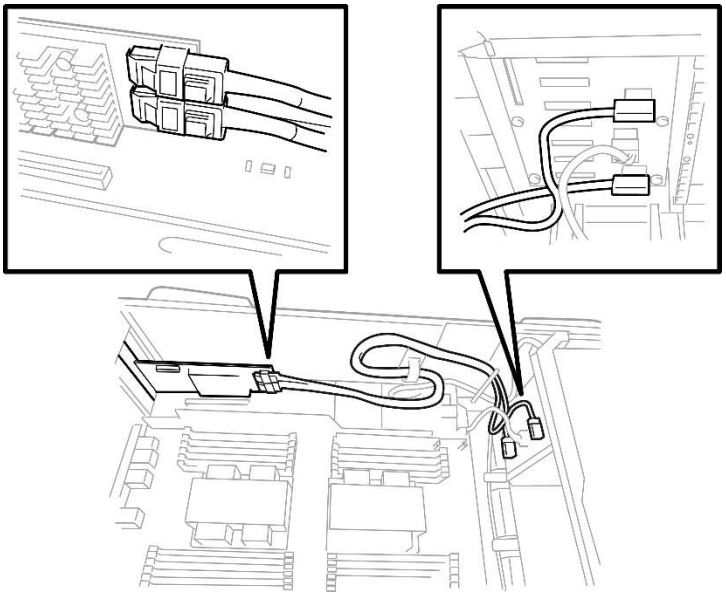


・Power cable for cache backup (when mounting to slot 5 and slot 7)

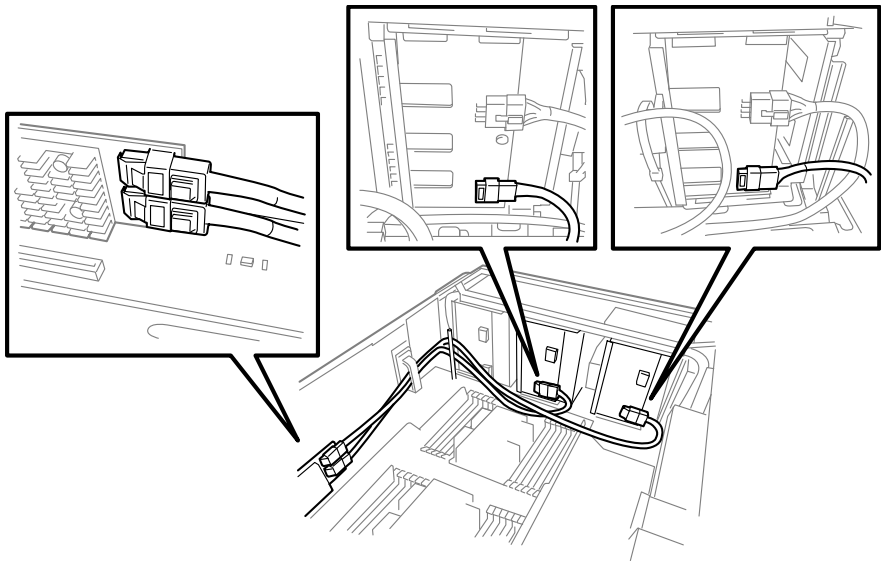


7. Connect the cables from ports 1 and 2 on the back plane to ports 1 and 2 on the N8103-195/201 controller board.

●8×2.5-inch drive model



●4×3.5-inch drive model



8. See *Chapter 2 (1.24 Installing Side Cover)* to attach the side 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. See Chapter 2 (2 Installation and Connection) to conduct installation and connection, and turn the power supply ON.

1.18.2 Removal

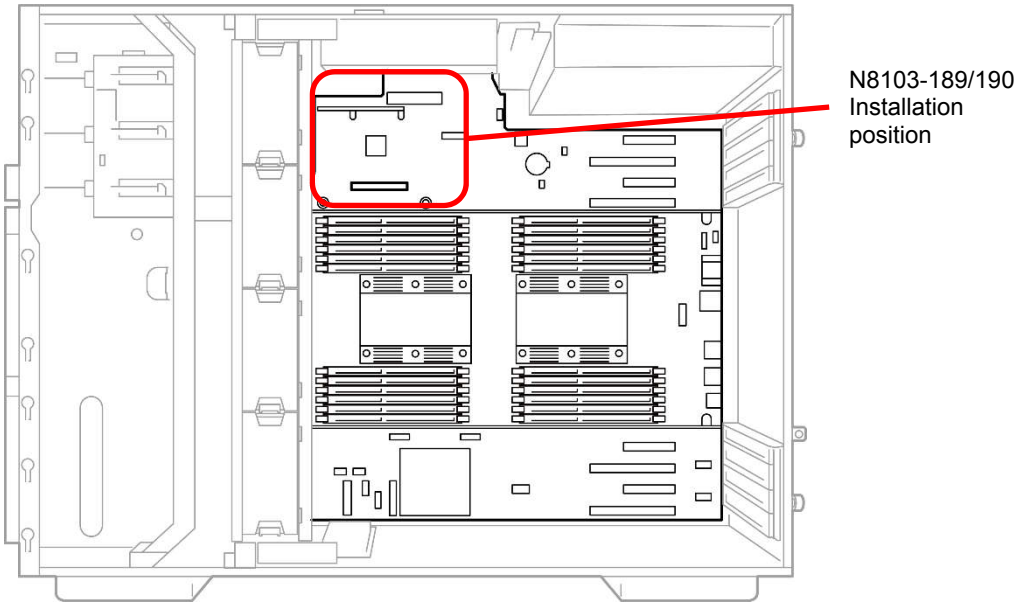
The procedure for removal is the reverse of installation.

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

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

1.19 RAID Controller N8103-189/190 (AROC Type-a)

This server provides RAID controller PCI card 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.

1.19.1 Installing N8103-189/190 RAID controller

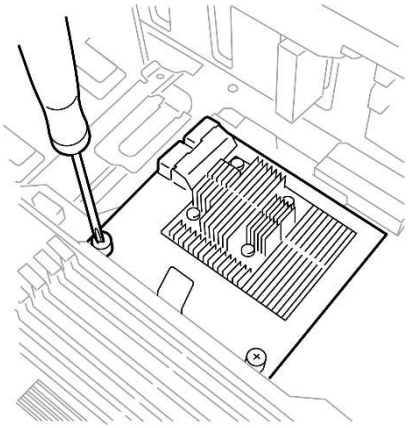
Please prepare the following before installing the option.

- Parts included in the option kit
- T-15 hexalobular driver

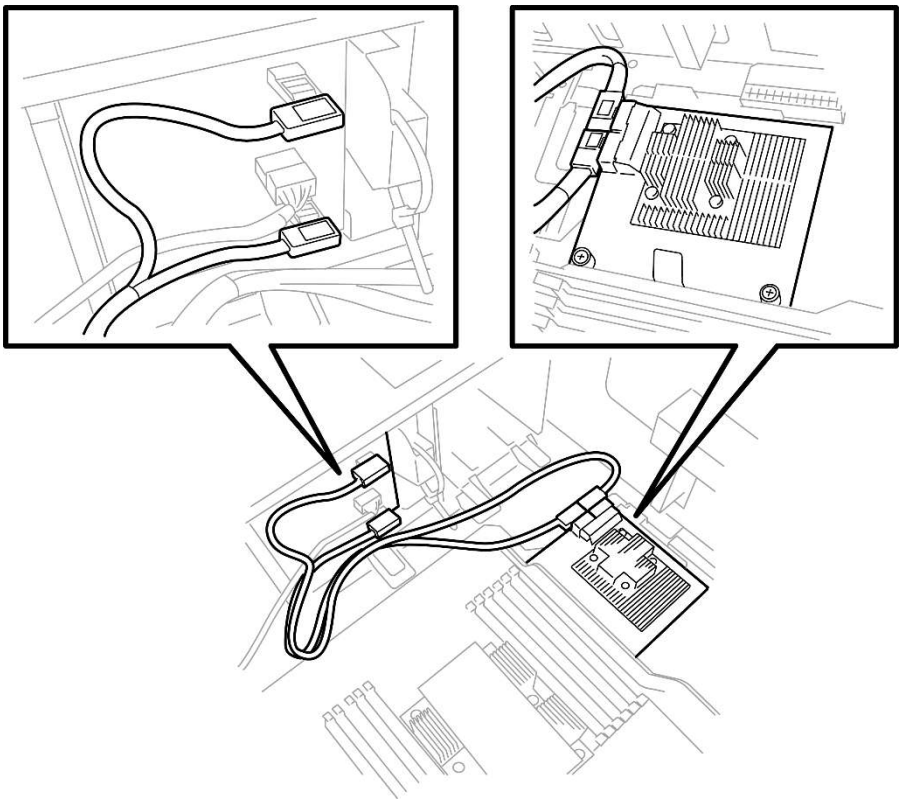
To install the components, follow these steps

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. 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 the SAS/SATA cable from the back plane to the controller port. The SAS/SATA cable is labeled "Port 1" or "Port 2" respectively. Connect them according to the label number.



5. See *Chapter 2 (1.24 Installing Side Cover)* to install the side 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.

6. See Chapter 2 (2 Installation and Connection) to conduct installation and connection, and turn the power supply ON.

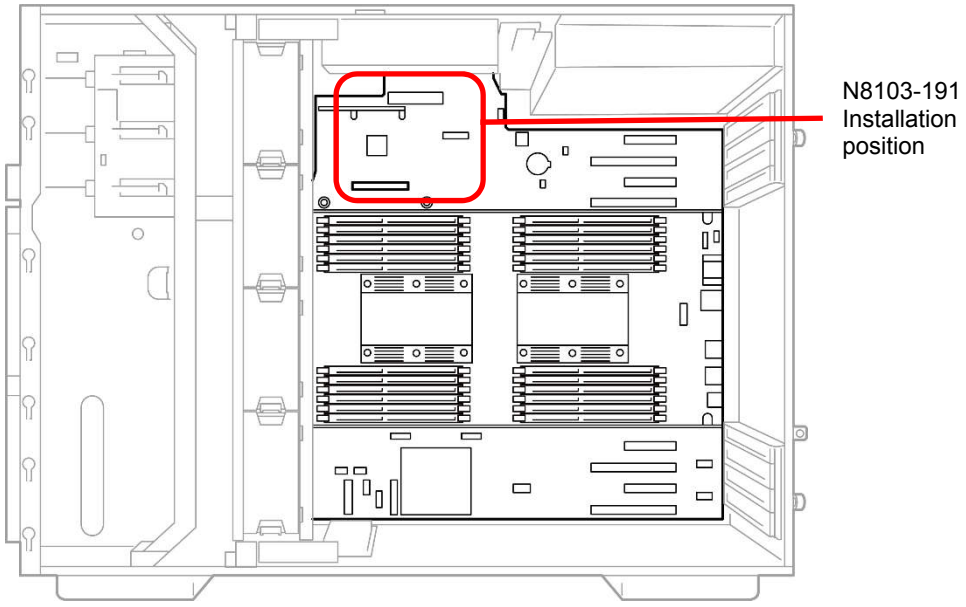
1.19.2 Removal

The procedure for removal is the reverse of installation.

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

1.20 RAID Controller N8103-191 (AROC Type-a)

This server provides RAID controller PCI card 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.

1.20.1 Installing N8103-191 RAID controller

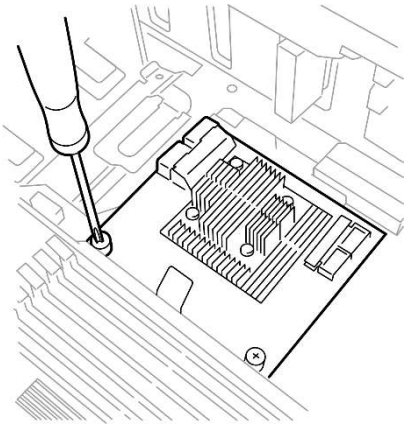
Please prepare the following before installing the option.

- Parts included in the option kit
- T-15 hexalobular driver

To install the components, follow these steps.

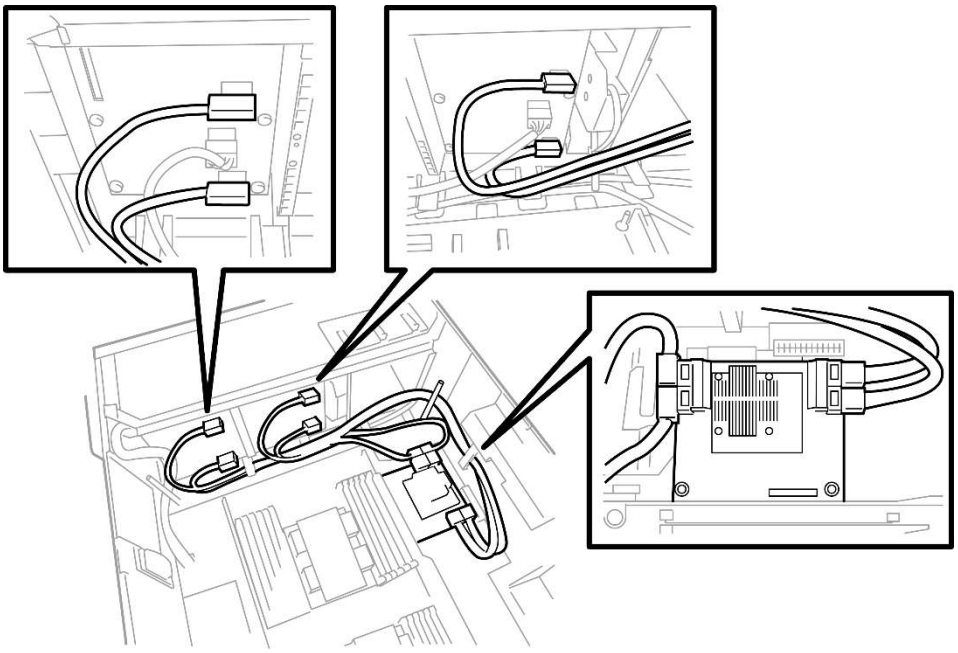
1. Back up all data in the server.
2. See steps 1 to 6 in Chapter 2 (1.2 Overview of Installation and Removal) for preparations.
3. Position the guide pin of the RAID controller to the connector of the motherboard, firmly insert it from above, tighten the screws securing it in place.

4. Secure the RAID controller with screws.

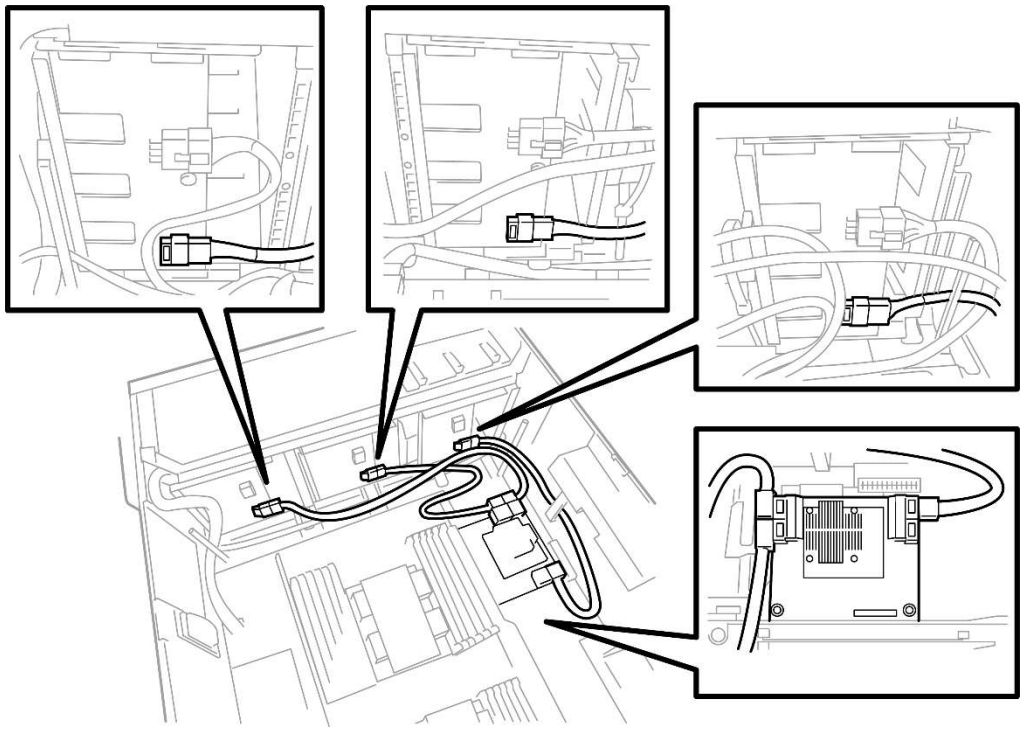


5. Connect the SAS/SATA cable from the back plane to the controller port.
   The SAS/SATA cable is labeled "Port 1" - "Port 4" respectively. Connect them according to the label number.

●2.5-inch drive model



●**3.5-inch drive model**



6. See *Chapter 2 (1.24 Installing Side Cover)* to attach the side 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. See Chapter 2 (2 Installation and Connection) to conduct installation and connection, and turn the power supply ON.

1.20.2 Removal

The procedure for removal is the reverse of installation.

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

1.21 RAID Controller Extension Battery

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,

1.21.1 Handling precautions

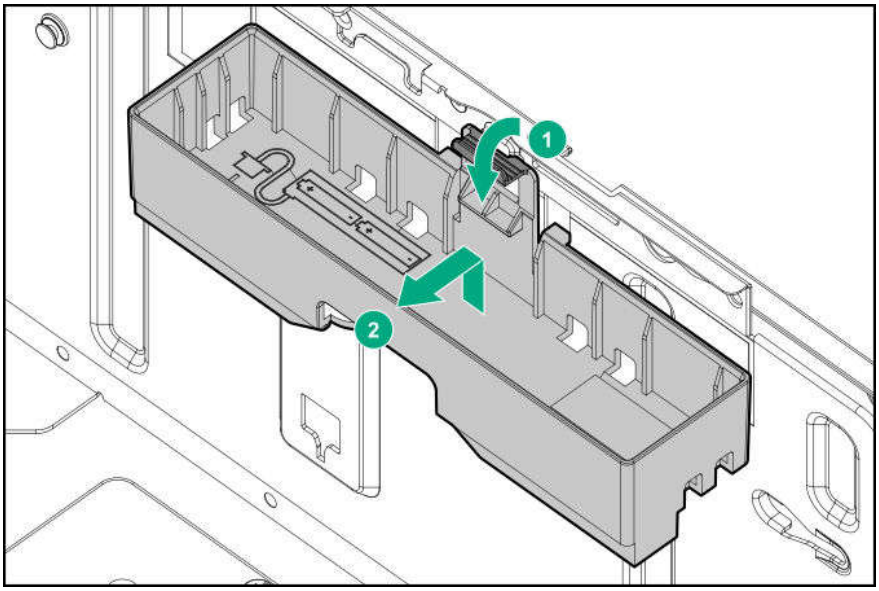
- When using an extension battery, please pay attention to the following. If you ignore the following warnings, there may be loss of data and hardware.
  - The extension battery is an extremely sensitive device. Prior to installation, avoid static electricity by touching the metal frame of the unit or 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 flash backup unit.

1.21.2 Installing N8103-198 Extension Battery in a Normal Setting

Check the parts of the kit before installing option.

To install the components, follow these steps.

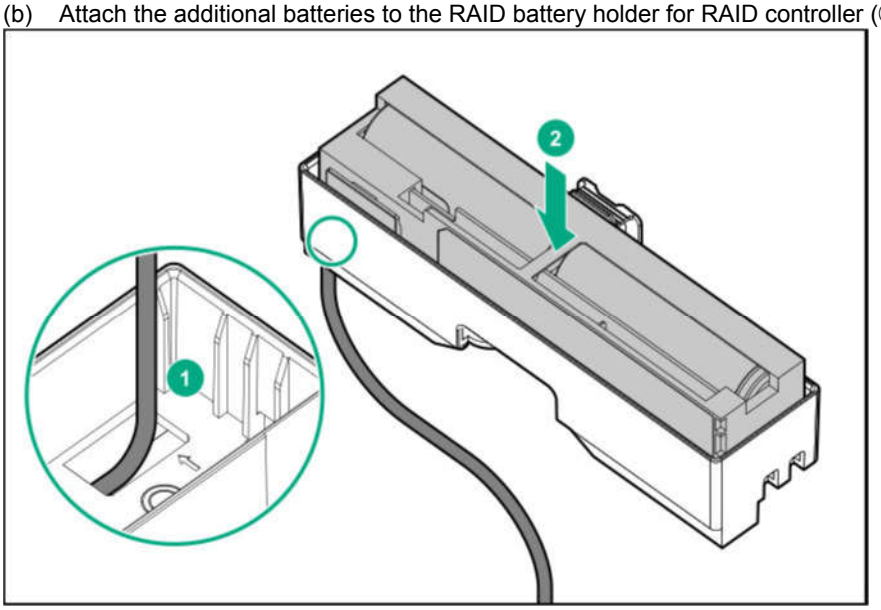
1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Press down on the latch to lift and remove the battery holder for RAID controllers from the main unit.



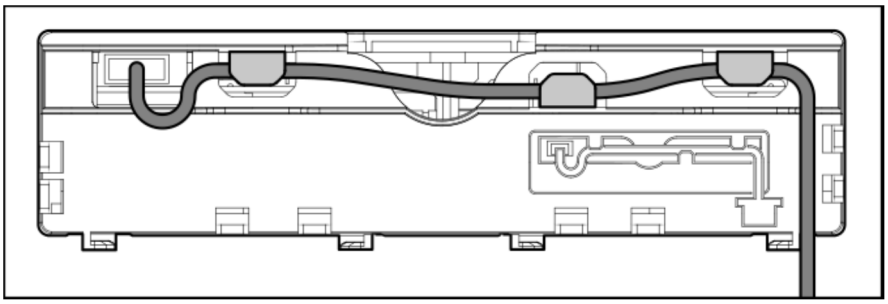
3. Attach additional batteries to the RAID battery holder for RAID controller.

   (a) Thread the cable for additional batteries through the hole in the RAID battery holder for RAID controller marked by an arrow (①).

   (b) Attach the additional batteries to the RAID battery holder for RAID controller (②).



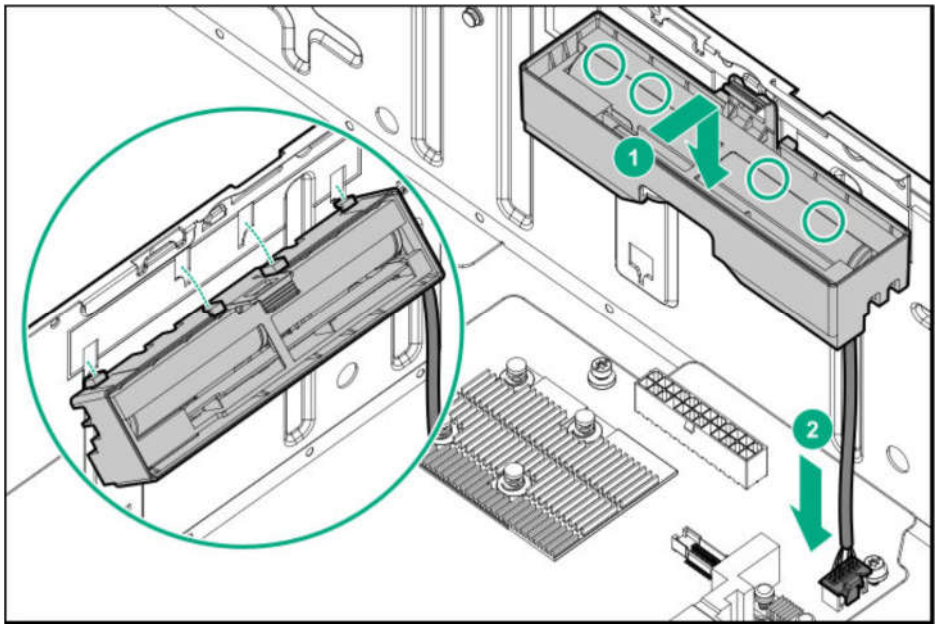
4. Thread and secure the cable for additional batteries through the cable clip on the RAID battery holder for RAID controller.



5. Attach additional batteries to the main unit.

   (a) Insert the tab on the RAID battery holder for RAID controller into their respective grooves on the main unit to attach.

   (b) Connect the cable to the battery connector for RAID controller on the motherboard.



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.

6. See Chapter 2 (1.24 Installing Side Cover) to attach the side cover of the server.

1.21.3 Removal

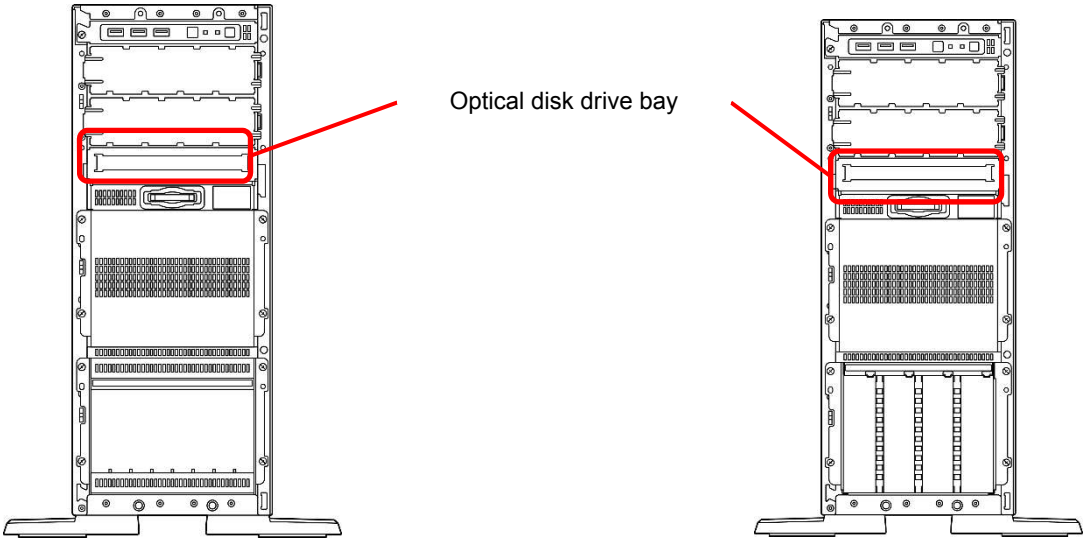
The procedure for removal is the reverse of installation.

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

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

1.22 Optical Disk Drive

The unit can be installed an optional optical disk drive in the optical disk drive bay.



1.22.1 Installing the Internal Drive DVD-ROM N8151-137/DVD-Super MULTI N8151-138

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.

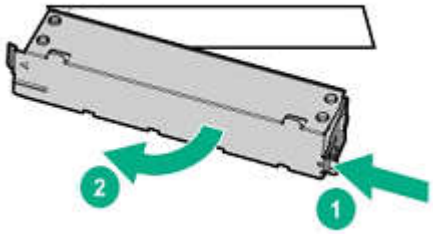
Please prepare the following before installing the option.

- Parts included in the option kit
- T-10 hexalobular driver
- Optical disk drive cable kit (K410-375(00))
- DVD-ROM drive (N8151-137) or DVD-Super MULTI drive (N8151-138)

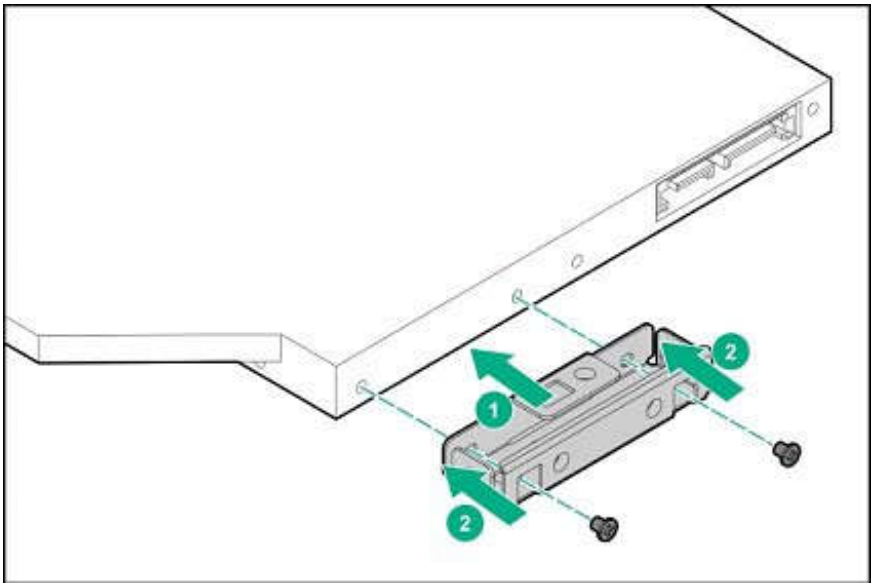
To install the components, follow these steps.

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.

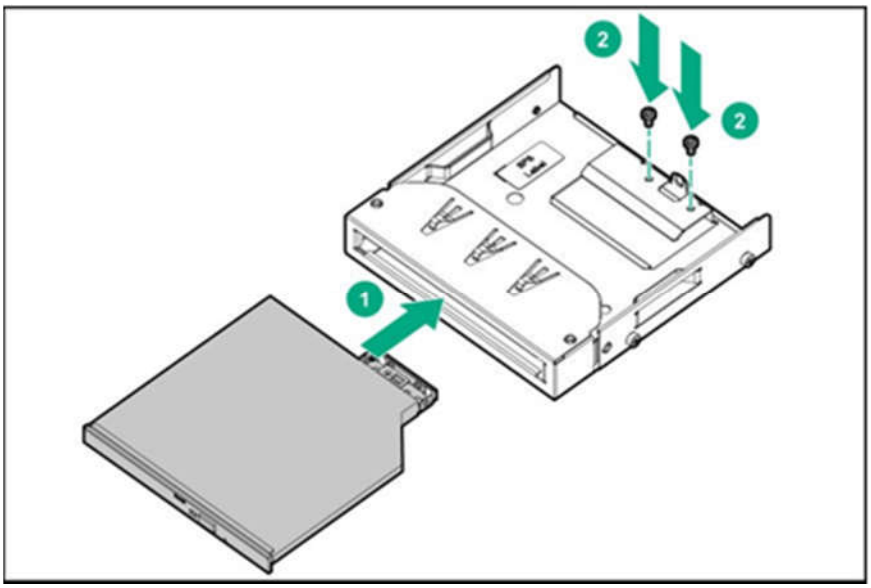
3. Pull forward the blank cover attached to the optical disk drive bay while pushing the latch, and remove it.



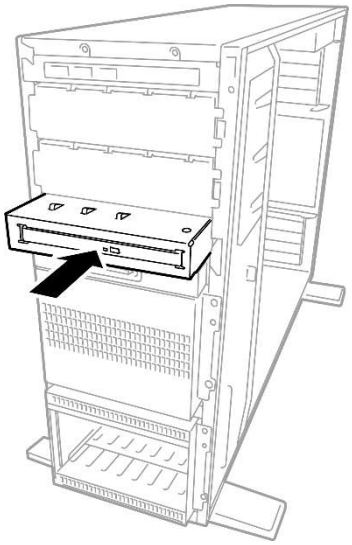
4. Secure the fixing bracket with the screws to the optical disk drive to be installed.



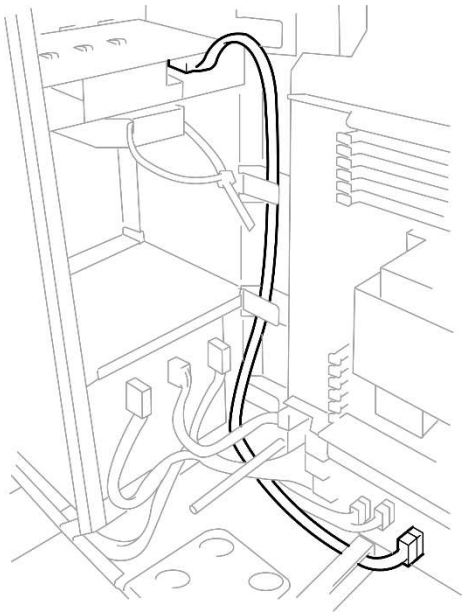
5. Attach the optical disk drive to the optical disk drive cage as shown below, and secure it with screws.



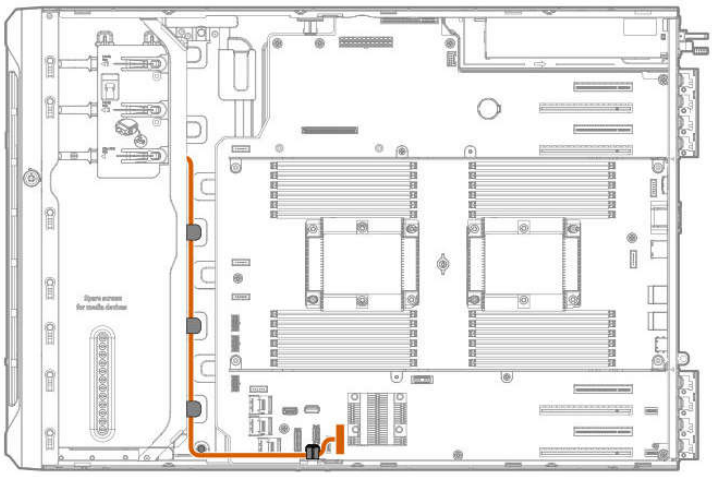
6. Install the optical disk drive cage that the optical disk drive has been mounted with to the main unit.



7. Connect the optical disk drive connector to the onboard SATA port 5 connector on the motherboard with the SATA cable for optical disk drive (K410-375 (00)).
   Wire the cables as shown below.



Cable routes are as follows.



8. See *Chapter 2 (1.24 Installing Side Cover)* to attach the side 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. See *Chapter 2 (2 Installation and Connection)* to conduct installation and connection, and turn the power supply ON.

1.22.2 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.**

1.23 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.

1.23.1 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	N8103-190/191/196/201
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.
To install the OS manually, use the RAID System Configuration Utility. For a detailed description of the utility, refer to Chapter 2 (2. RAID System Configuration) in Maintenance Guide, or the manual attached to the optional RAID controller (N8103-189/190/191/195/196/201).

Important **Build a Disk Array in the RAID System using hard disk drives that have the same specifications (capacity, rotational speed, and standard).**

1.24 Installing Side Cover

When all internal optional devices are installed, attach the server with side cover.

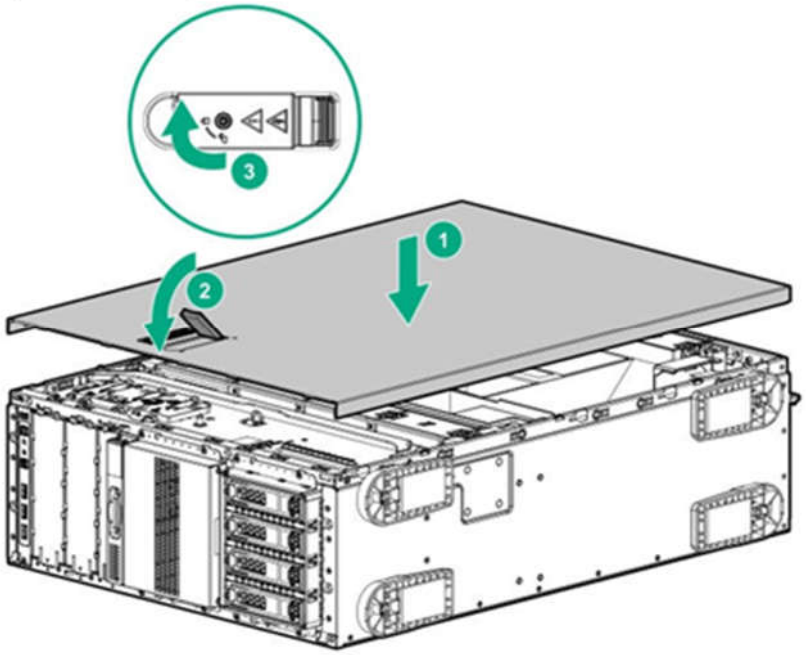
Please have ready a T-15 hexalobular driver.

Important **For safety reasons, please operate with the device laid on its side.**

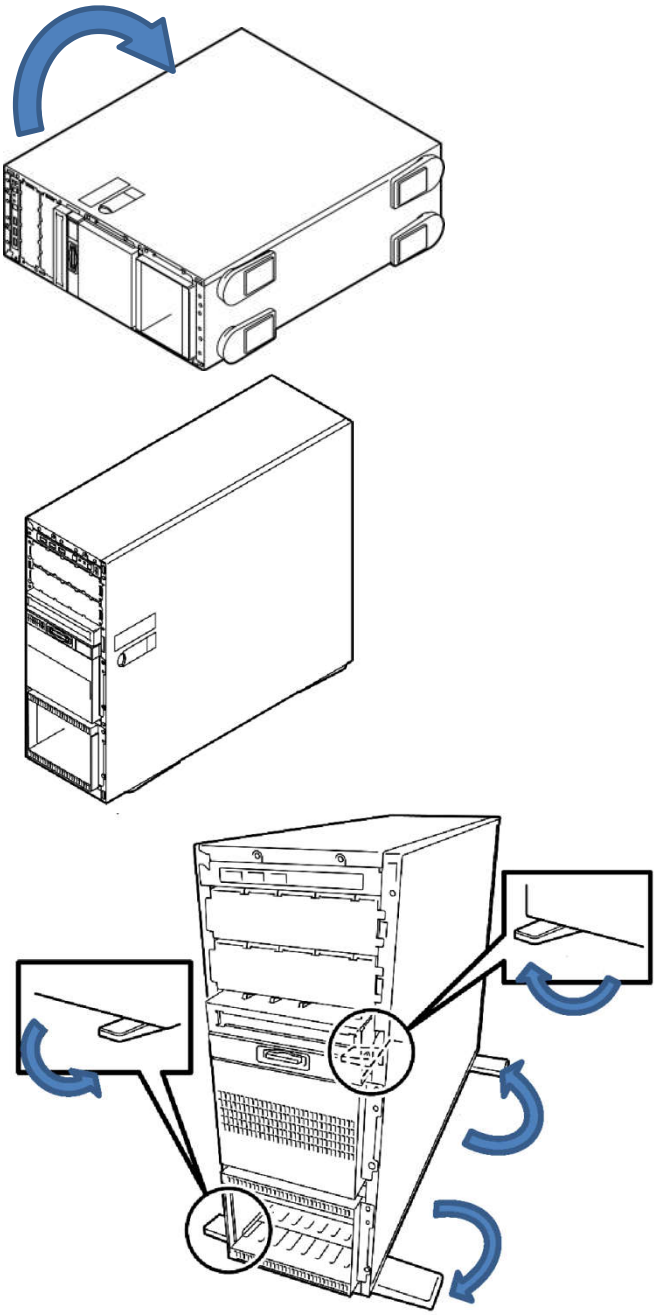
1. Place the side cover straight on the unit while pulling up the lever of the side cover, so that it can be inserted securely into the frame.
   At this time, make sure that the each protrusion of the unit is fitted into a corresponding hole in the lever.

2. Push down the lever, and slide the side cover until it is completely closed.

3. Tughten the security screws on the side cover lever with the T-15 Hexalobular screwdriver.



4. Place the server vertically and rotate the 4 stabilizers.



1.25 Drives

The expansion bay for connecting drives is located on the front of the server. 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.**

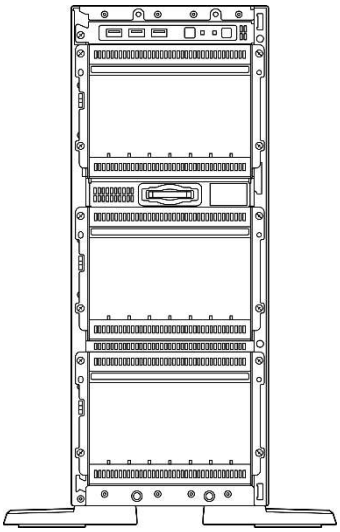
SAS, SATA, NVMe, and M.2 drives (depending on configuration) are supported.

Follow these guidelines when adding drives to the server.

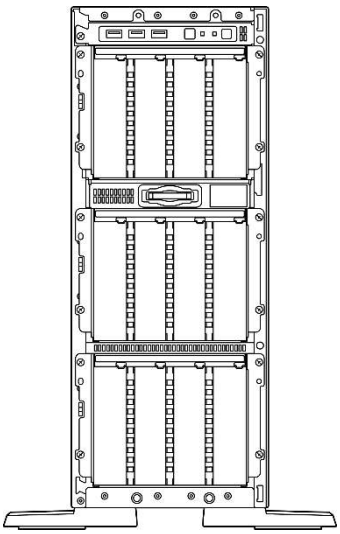
- All the device numbers are automatically set by the system.
- If you are using only one hard disk drive, please install it in the bay with the smallest device number.
- NVMe SSD is a PCIe bus device. Devices mounted on the PCIe bus cannot be removed without the device and the bus completing/stopping the signal/traffic flow.
  Do not remove the NVMe SSD from the drive bay while the LED is flashing. To indicate that the SSD is still in use, thenon-removable button LED flashes. Removing the NVMe SSD before the device completes/stops the signal/traffic flow causes NVMe SSD data loss.
- 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 slot numbers have been assigned to each slot.

8x 2.5-inch drive model (SAS/SATA HDD/SSD)



4x 3.5-inch drive model (SAS/SATA HDD)



Support Drive Center

- 2.5-inch carrier (SC)
- NVMe 2.5-inch carrier (SCN)
- M.2 2.5-inch carrier (SCM)
- 3.5-inch carrier (SC)

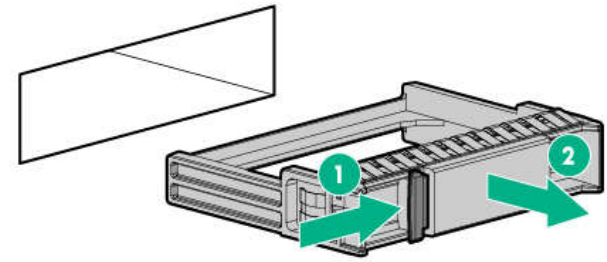
1.25.1 Installing a SAS or SATA Drive

Install a hard disk drive by using the following procedure.

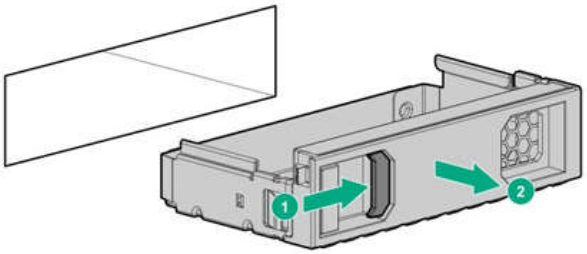
Note In the RAID System, use hard disk drives that have the same specifications (capacity, rotational speed, and standard) for each Disk Array.

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 slot number.

2. Remove the dummy tray.
   Dummy trays are installed in every slot.



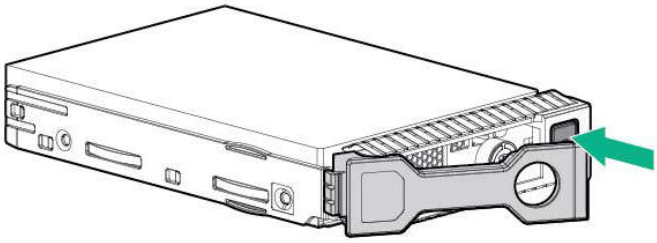
2.5-inch drive



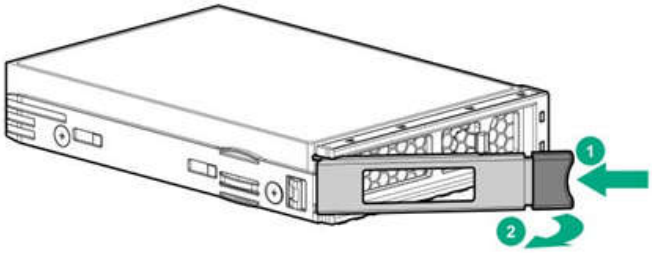
3.5-inch drive

Note Keep the removed dummy trays for future use.

3. Prepare the drive.
   Unlock the handle of the tray.

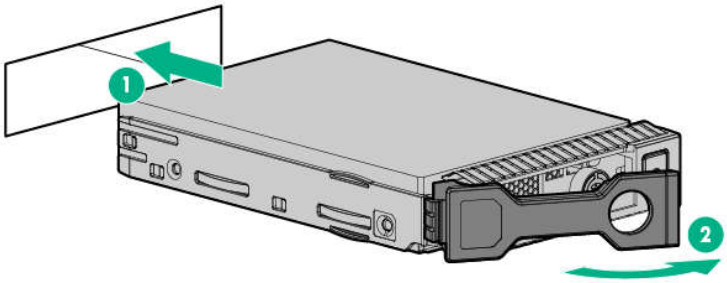


2.5-inch drive

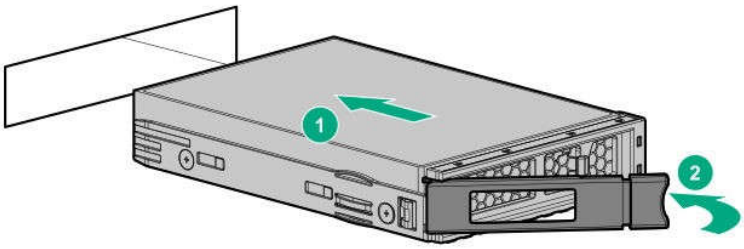


3.5-inch drive

4. Hold the tray firmly and insert it into the slot.



2.5-inch drive



3.5-inch drive

Note

- Push it all the way until the handle's lock touches the frame.
- Hold the tray firmly with both hands.

5. Close the handle slowly.

   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. Confirm the status of the drive from the combination of the LEDs of the drive.

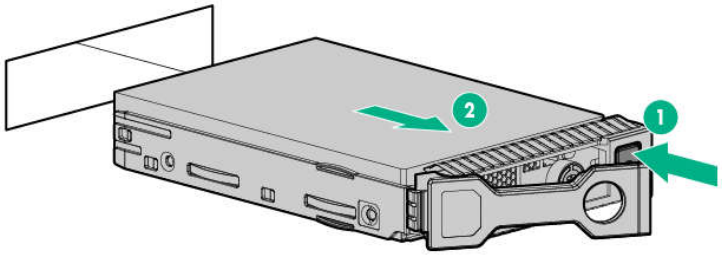
1.25.2 Removing Hot Plug Compatible SAS/SATA Drive

Note

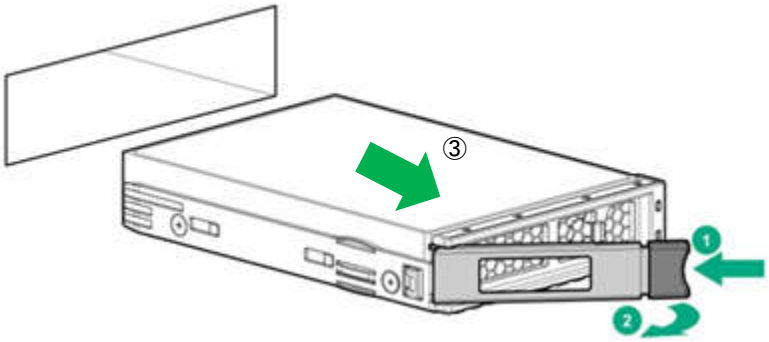
To ensure adequate cooling effect, access panel, baffle, expansion slot cover and blank should be installed for server operation.
If the server supports hot-plug compatible components, please minimize the opening time of the access panel.

1. Confirm the status of the drive from the combination of the LEDs of the hot-plug SAS drive.
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.



2.5-inch drive



3.5-inch 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.

1.25.3 Installing NVMe Drive (To be released in January 2018)

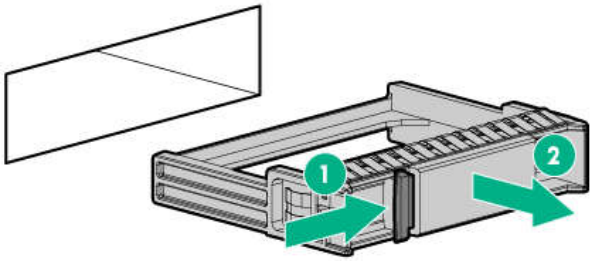
NVMe drives are supported, when the front 2.5-inch drive cage and/or 2 x2.5-inch drive cage is installed. For supported NVMe drives, See *Chapter 1 (4.9.3 Device number of 8x2.5 inch drive model (NVMe/SAS))*.

To install the drives, follow these steps.

Note

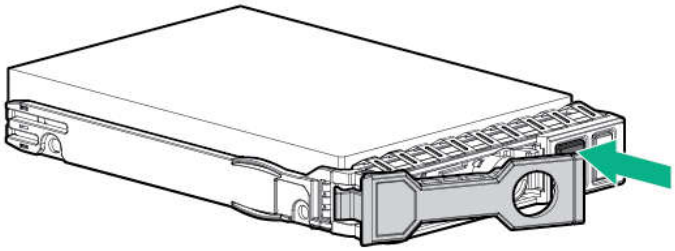
In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

1. Remove the drive blank if it is installed.

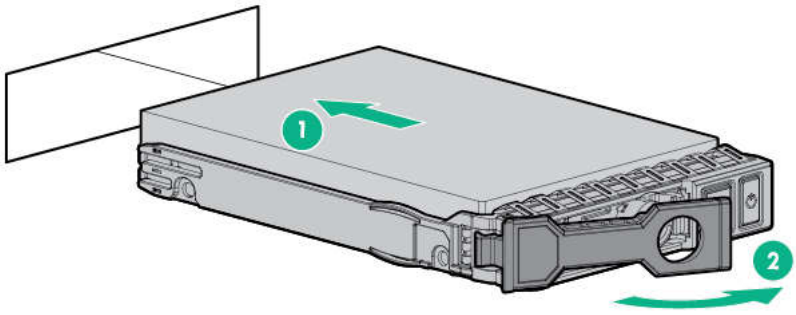


2. Prepare the drive.

   Press the removal prohibit button 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.

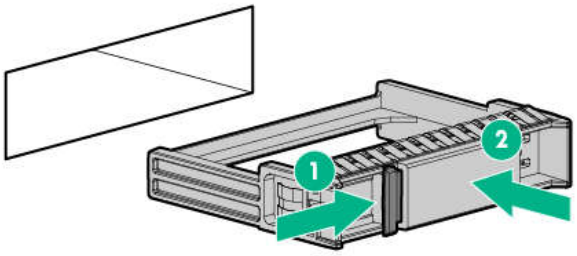
4. Close the handle slowly.

   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.

5. Install the SFF (2.5-inch) drive blank in the drive bay unused.



1.25.4 Removing NVMe Drive

To remove the NVMe drive, follow the procedure below. In addition, when discarding or transferring the removed NVMe drive, make sure to erase the data at your own risk in accordance with *Chapter 1 (1. Relocation 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.**

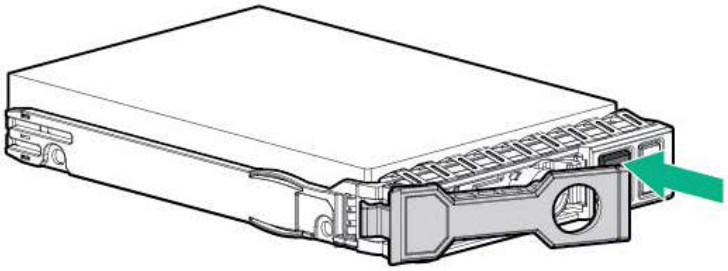
To remove the components, follow these steps.

1. Press the power button.

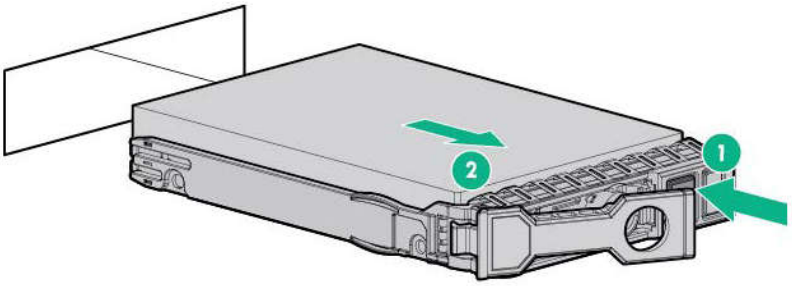
   The LED of the removal prohibit button lights up and flashes. Do not press this button while the LED is lit.

   Note Do not remove the NVMe SSD from the drive bay if the LED of the removal prohibit button is flashing. The flashing LED of the removal prohibit button indicates that the device is still in use. Removing the NVMeSSD before completion of the device signal and traffic flow may result in data loss.

2. When the LED of the removal prohibition button does not flash nor lights up, press the removal prohibit button and open the release lever.



3. Remove the drive.



1.26 Power Supply Unit

A redundant configuration can be set with two hot-swappable power supply units (The standard version has one unit which is the required option).

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.

1.26.1 Installing

(1) Power supply unit (AC)

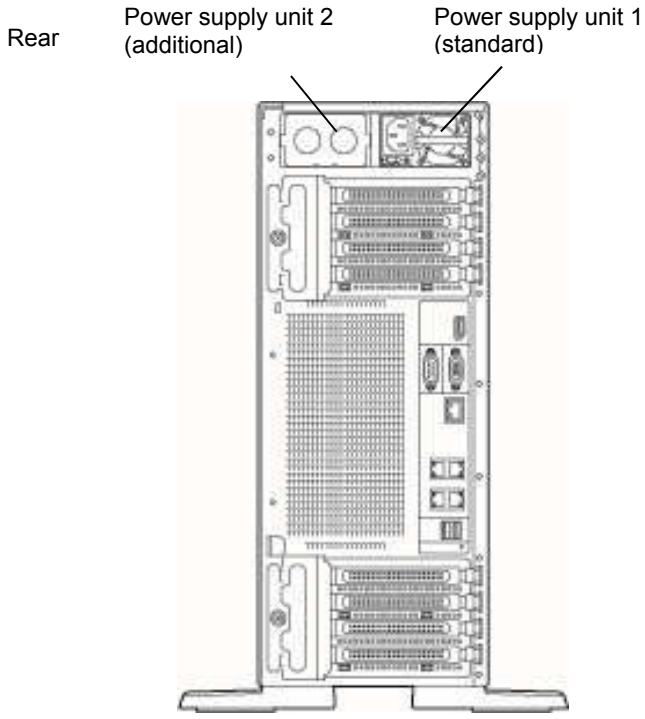
Follow steps below to install a power supply unit:

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.

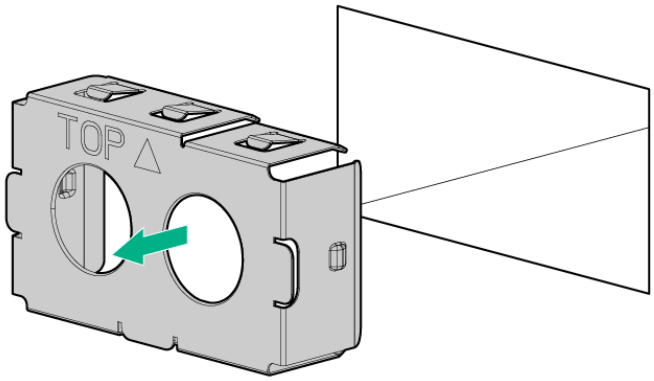
Note In order to prevent damage of the system due to improper cooling or elevated temperature, please do not activate the server or enclosure without implementing any of component or blank on all of drive bays and device bays.

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. Remove the blank cover of power supply unit.

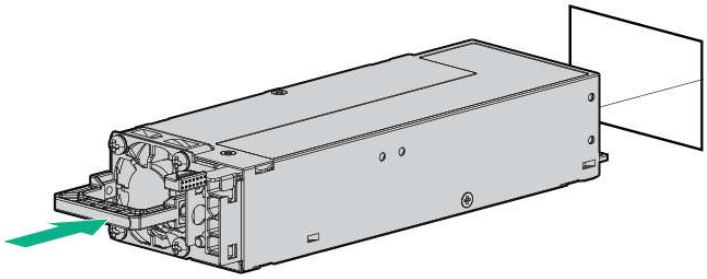


Important **The surface becomes hot after use so to avoid burns please allow the drive and internal parts of the system to cool before touching.**



Note Keep the removed blank cover for future use.

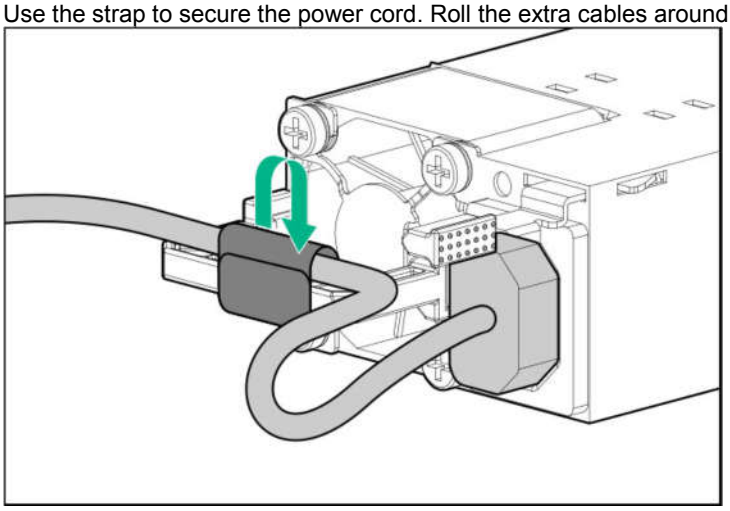
3. Insert the power supply unit until it is locked with clicking sound.



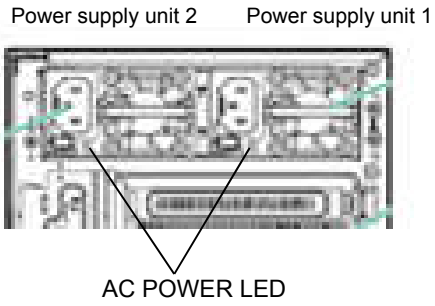
4. Connect power cords.

   Use the specified power cords.

   Use the strap to secure the power cord. Roll the extra cables around the power handle.



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 error.
   If AC POWER LEDs are off, reinstall the power supply units. If the same error occurs, contact your sales representative.

(2) Power supply unit (DC)

Follow steps below to install a power supply unit:

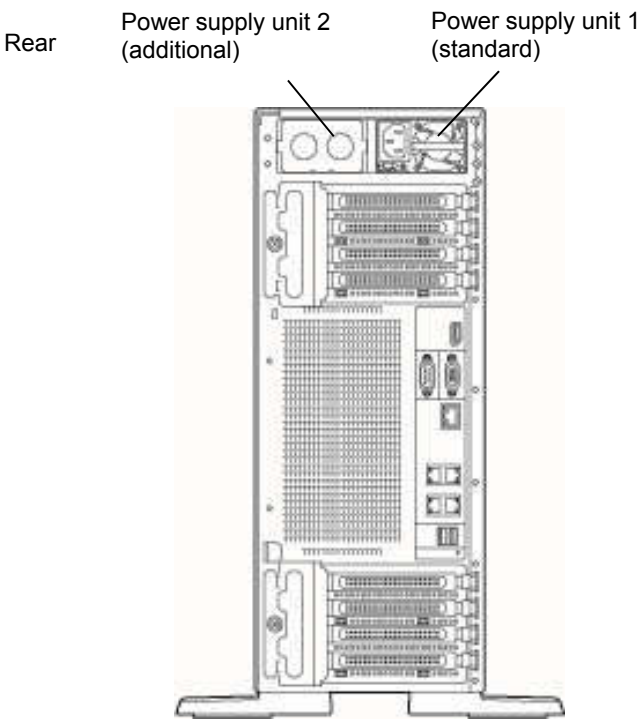
Note The both two power supply units installed in the server must have the same capacity. Make sure that the two power supply units have the same part number and the same label color. If the two power supply units are inappropriate, the system may become unstable to be shut down.

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.

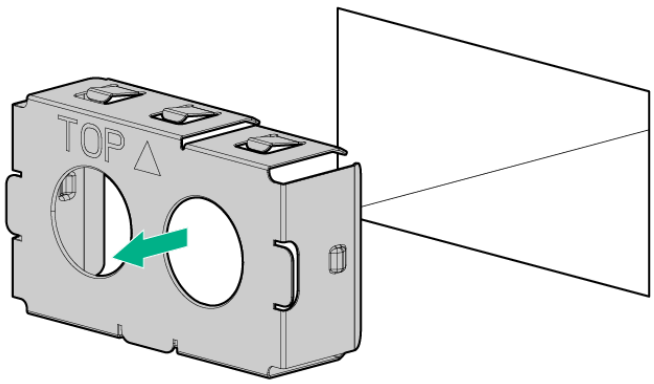
To install the components, follow these steps.

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

2. Remove the blank cover of power supply unit.

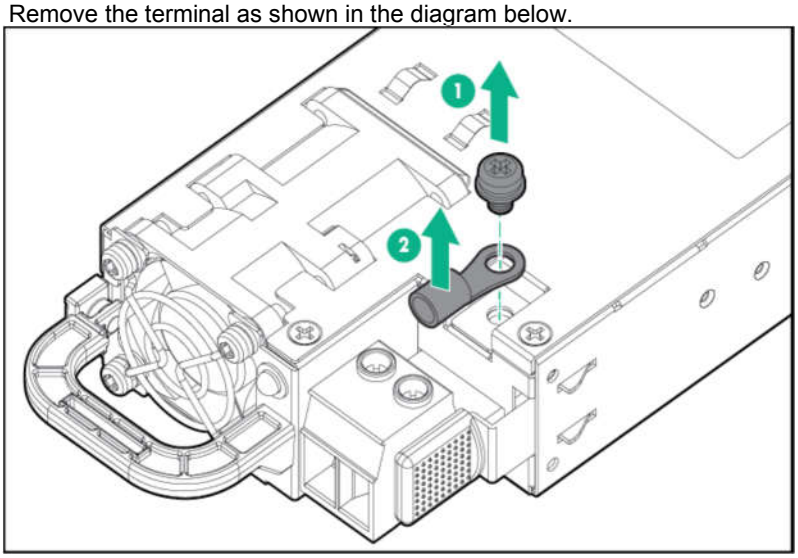


Important **The surface becomes hot after use so to avoid burns please allow the drive and internal parts of the system to cool before touching.**

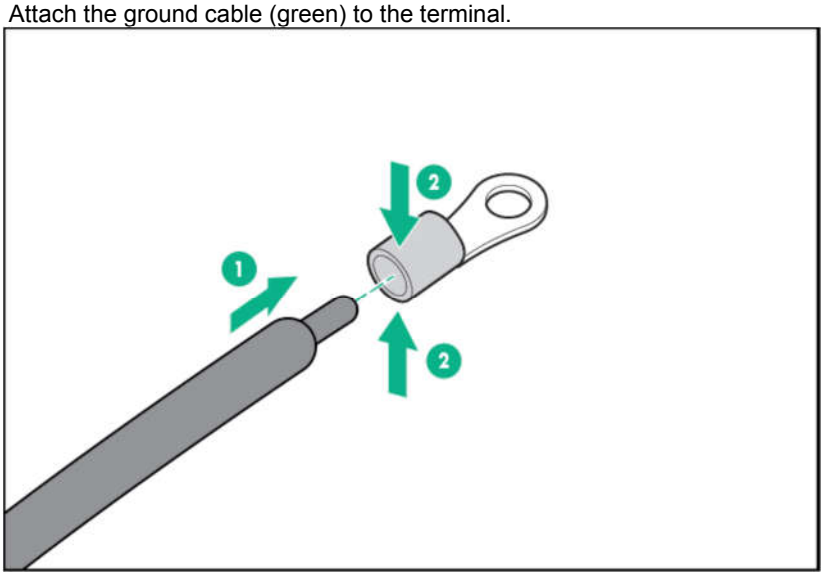


Note Keep the removed blank cover for future use.

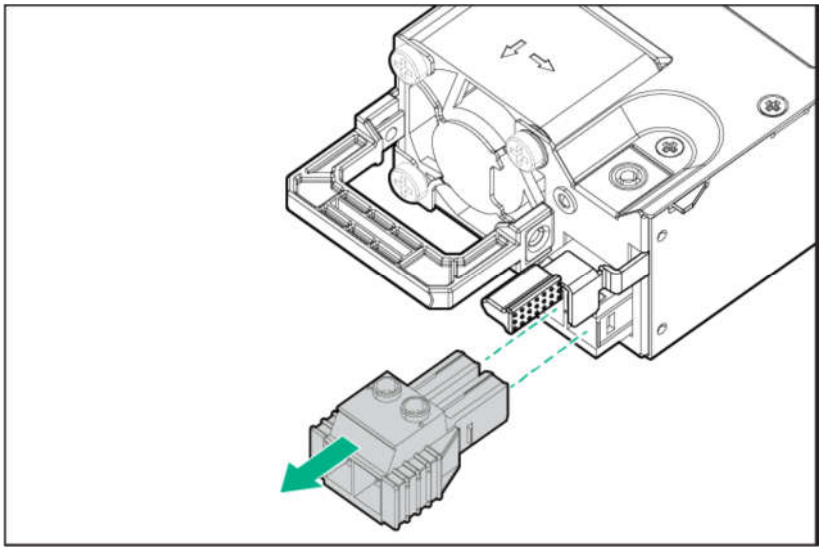
3. Remove the terminal as shown in the diagram below.



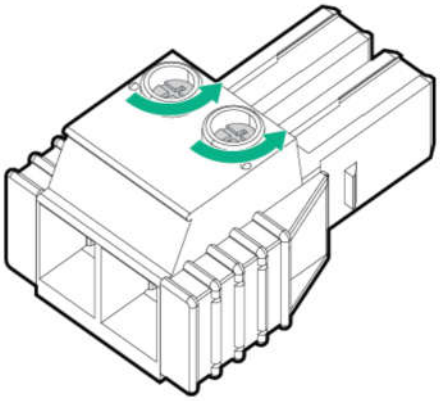
4. Attach the ground cable (green) to the terminal.



5. Remove the terminal block connector.

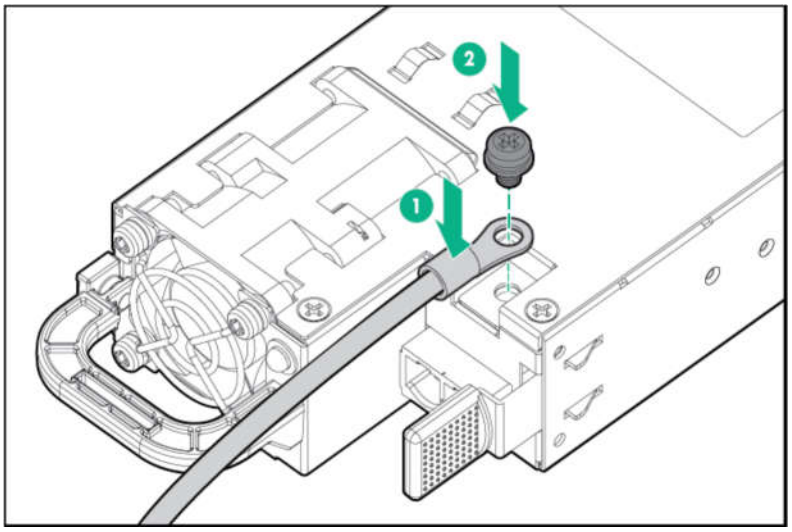


6. Loosen the screw on the terminal block connector.

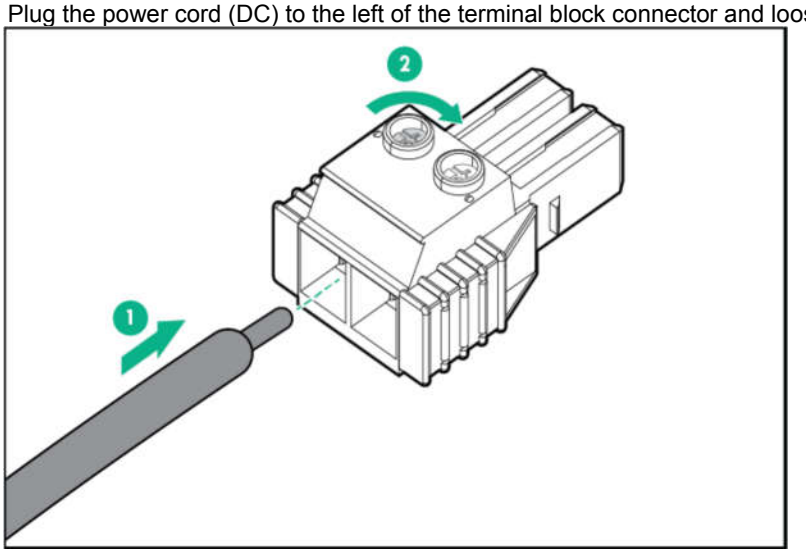


7. Take the ground cable attached to the terminal in step 3 and attach it to the power unit (DC) using a screw.

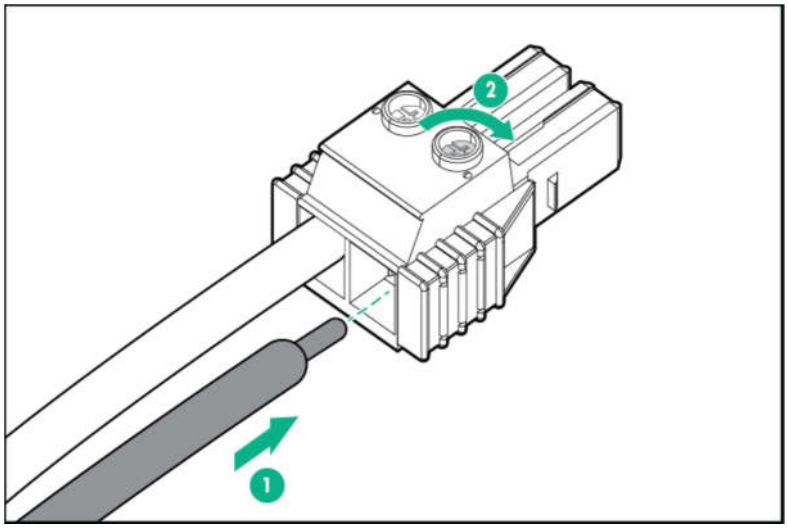
Important **Make sure the ground cable is attached before attaching the power cord.**



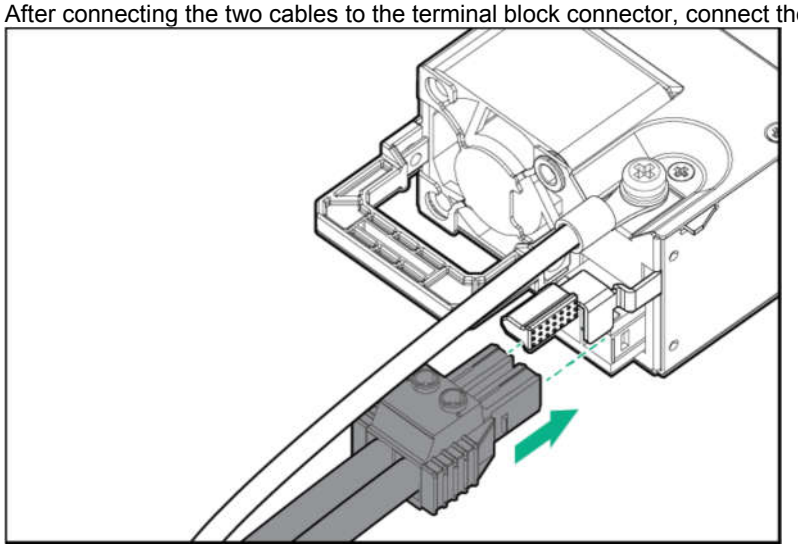
8. Plug the power cord (DC) to the left of the terminal block connector and loosen the screw.



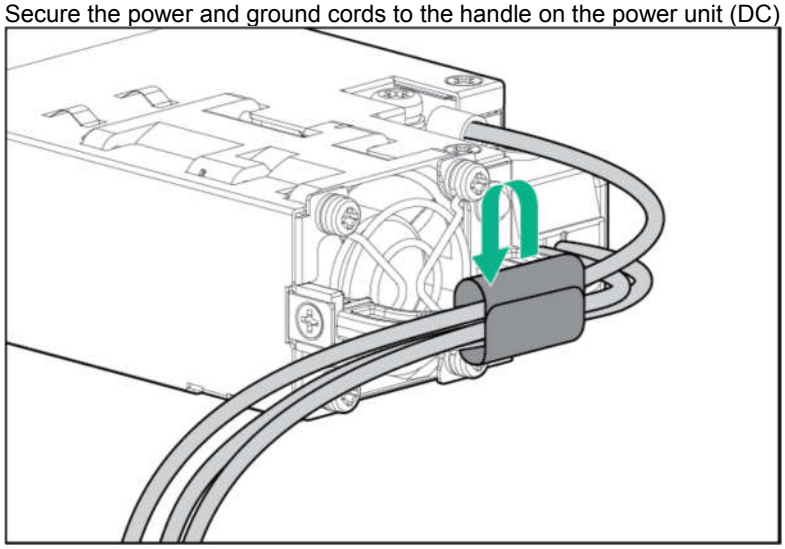
9. In the same manner, plug the return cord (DC) to the right of the terminal block connector and loosen the screw.



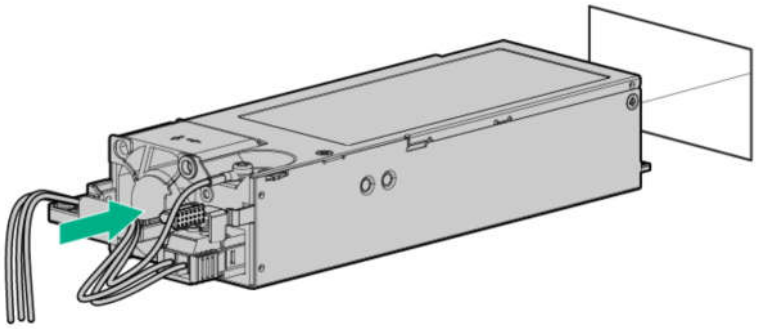
10. After connecting the two cables to the terminal block connector, connect them to the power unit (DC).



11. Secure the power and ground cords to the handle on the power unit (DC) using a strap.

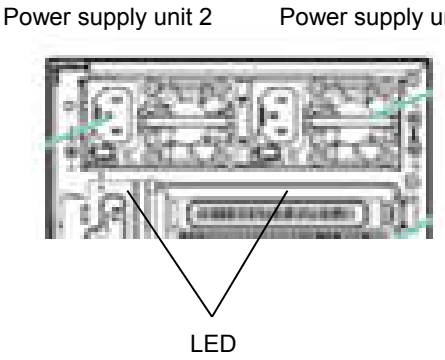


12. Insert the power unit (DC).



13. Turn off the power (DC) source or the breaker to connect the cables from the power unit (DC) to the power (DC) source.

14. Turning the power (DC) source on will enable the LED on the power unit (DC) to flash.



15. Turn on the power of the server

16. Check that there are no errors regarding the power unit in the STATUS LED or POST.
Regarding the details of the errors, see Chapter 3 (1. IML Error Messages) in the “Maintenance Guide.”
If the power unit LED does not light up, reattach the power unit. If the same errors occur even after that, contact your sales representative.

1.26.2 Replacing/removing a failing power supply unit

Replace only when the power supply unit fails.

⚠ CAUTION

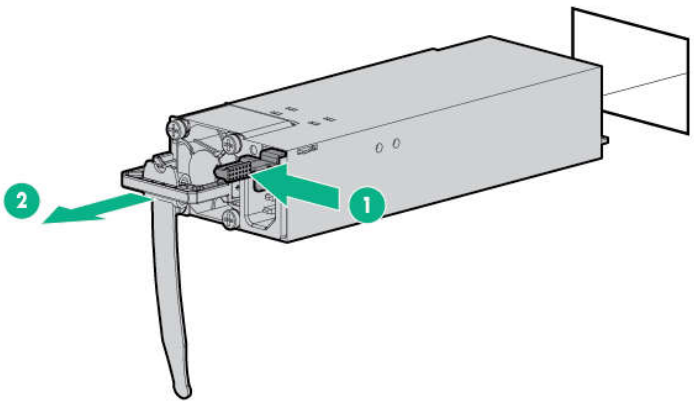
Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to Safety Precautions and Regulatory Notices.

- **Pay attention to electric hazard.**

Important **Do not remove a power supply unit operating normally.**

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.

1. Check the power supply unit whose AC POWER LED lights in amber or flashes.
2. Power off the server.
3. Disconnect the AC power cord from the failing power supply unit.
4. Push the lever of the power supply unit toward inside, and pull the power supply unit while holding the handle.



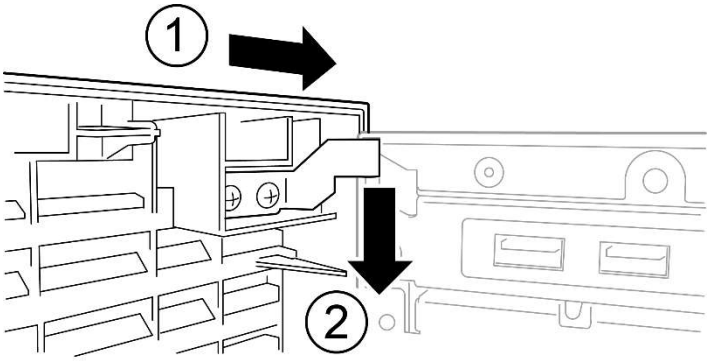
5. If operating the server with a single power supply unit without installing a new one, install the blank cover you removed in step 2 of installation procedure.

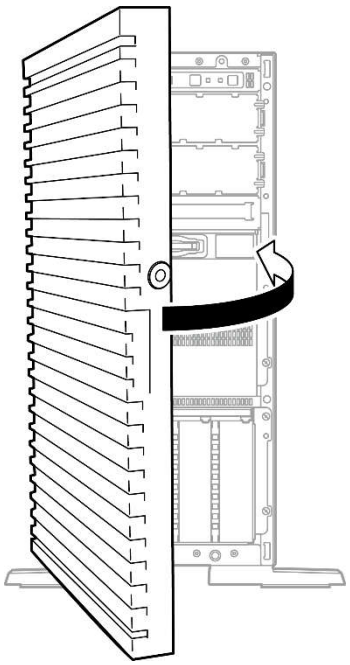
Important **To maintain the cooling effect in the server, be sure to install the blank cover in the vacant slot.**

6. Install the new power supply unit taking steps 3 to 6 in *Chapter 2 (1.26.1 Installing)*, and confirm that the power supply unit is installed normally.

1.27 Installing Front Bezel

When installing the front bezel, insert the edges of the hinges at the left end of the front bezel into the frame hole on the front left side of the unit, and then close the front bezel. After completion of installation, lock it with the key.





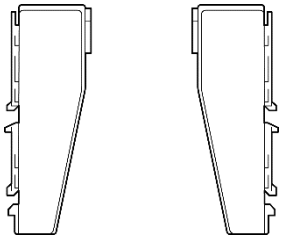
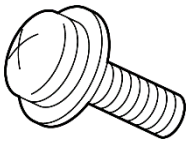
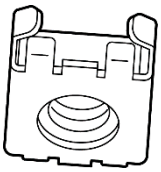
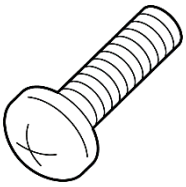
Important **Be careful not to press the POWER switch.**

1.28 Tower to Rack Converter Option

The server supports tower to rack conversion.

The tower to rack conversion option kit contains the following:

- Tower to rack conversion kit
  1. Bracket (left and right) (* will not be used)
  2. Screw 1 (T-15) x3
  3. Nut cage x4 (* will not be used)
  4. Screw 2 (+) x2 (* will not be used)
  5. Cable management arm
  6. Rail
  7. Server tray

<table>
<tr><td>  </td><td>  </td><td>  </td><td>  </td></tr>
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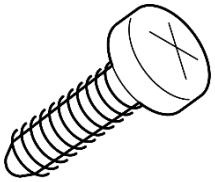
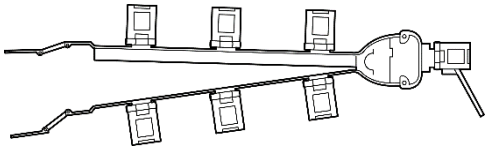
<tr><td>  </td><td colspan="3">  </td></tr>
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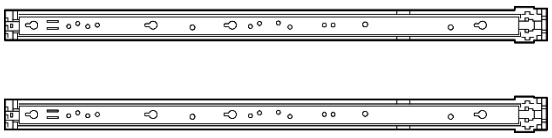
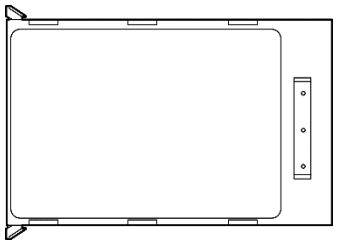
<tr><td colspan="2">  </td><td colspan="2">  </td></tr>
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</table>

Observe the following for tower to rack conversion:

WARNING: This server is heavy. To reduce the risk of personal injury or damage to the equipment:

- Observe local occupational health and safety requirements and guidelines for manual material handling.
- Get help to lift and stabilize the product during installation or removal, especially when the product is not fastened to the rails.Installation of all the rack servers is recommended to be performed by two or more persons. A third person may be required to help align the server if the server is installed higher than chest level.
- Use caution when installing the server in or removing the server from the rack; it is unstable when not fastened to the rails.

To avoid risk of personal injury or damage to the equipment, do not stack anything on top of rail- mounted equipment or use it as a work surface when extended from the rack.

To avoid the danger of electric shock or equipment damage, please note the following:

- Do not disable the grounding plug on the power cable. For safety reasons, the grounding plug is an important function.
- Plug the power cable into a grounded (with earth wire) power supply that is easily accessible at all times.
- To cut off the power for equipment, unplug the power cable from the power supply.
- Do not allow the cables to be placed where it may be walked on or pinched. Pay particular attention to the points where the cord is extended from plug, outlet and server.

To avoid the risk of electric shock, fire, equipment damage, etc., do not connect telephone or communication connector to RJ-45 connector

CAUTION:

Always plan the rack installation so that the heaviest item is on the bottom of the rack. Install the heaviest item first, and continue to populate the rack from the bottom to the top.

Important

When using the cable management arm, make sure that each cable has enough margin so that the cables are not damaged when the server is pulled out of the rack.

1.28.1 Preparing the server for rack conversion

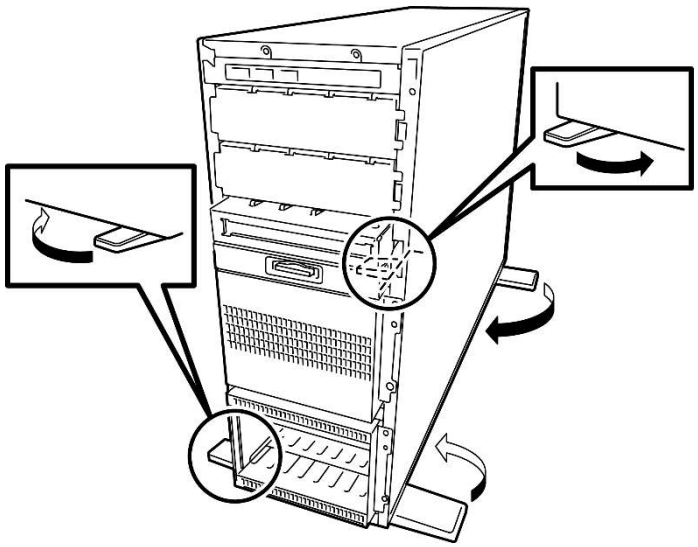
Prerequisites

Before preparing the server for rack conversion make sure you have the following:

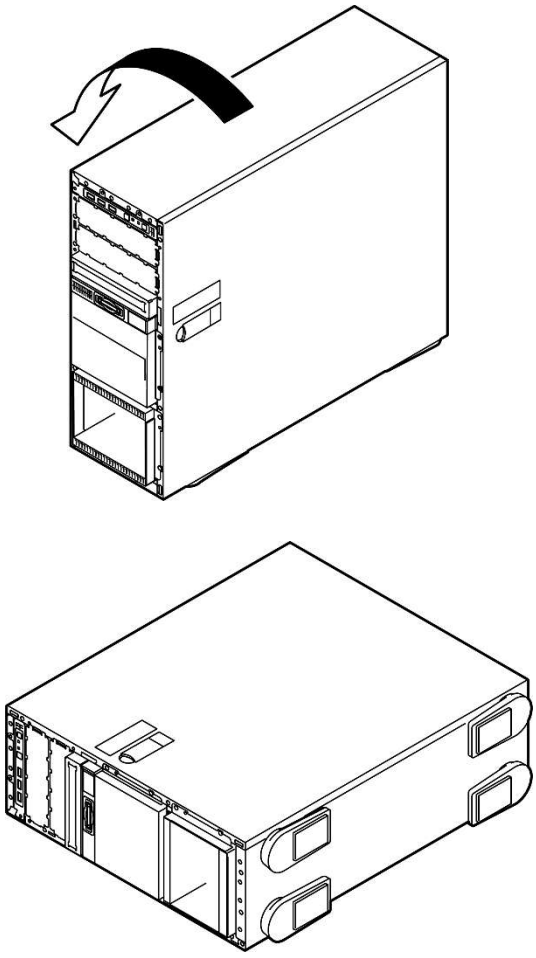
- Server
- T-15 screwdriver

Procedure

1. Remove the front bezel.
2. Power down the server.
3. Remove all power:
   a. Remove all power:
   b. Disconnect each power cord from the server.
4. Rotate the four server feet and place the server on the side.
   a. Rotate the server feet.



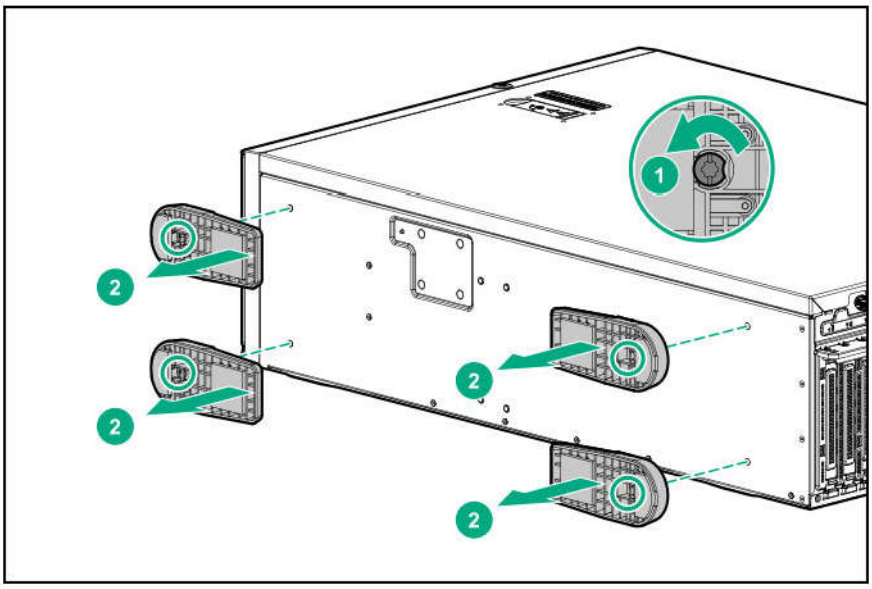
b. Place the server on the side.



5. Remove the four server feet from the server.

a. Loosen the screws from the foot.

b. Remove the foot from the server.



1.28.2 Installing the server to the rack

These rack rails can be installed for both round hole and square hole rack shelf.

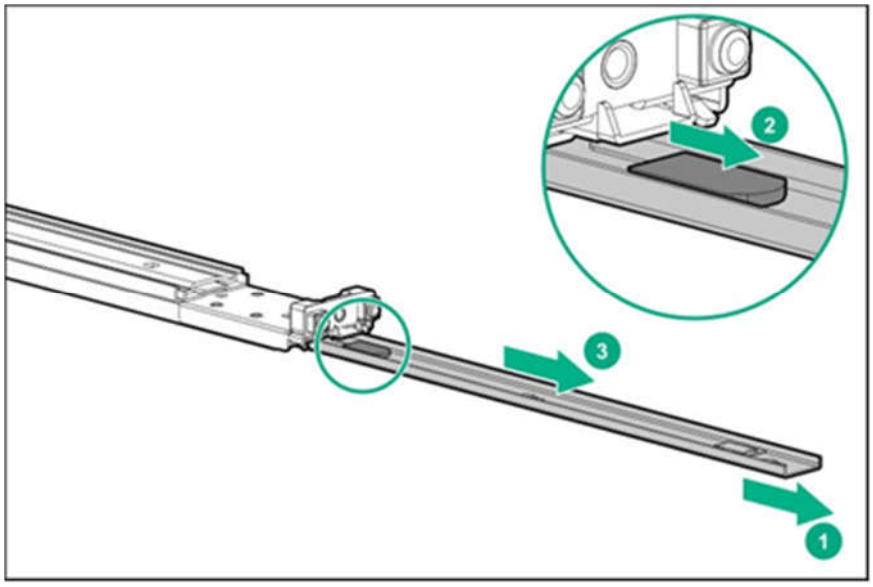
Prerequisites

Before installing the component make sure you have the following:

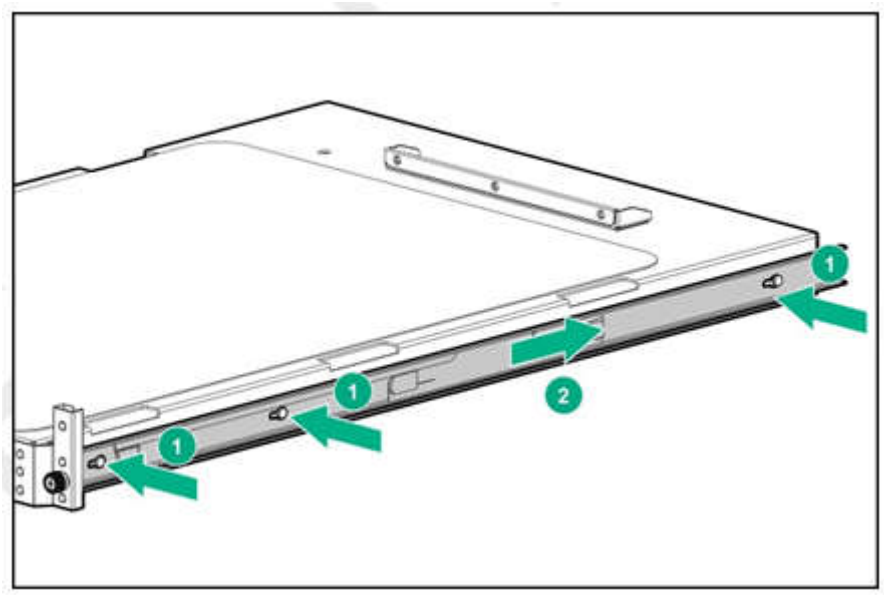
- Rail
- Server tray
- Cable management arm
- T-15 Screwdriver

Procedure

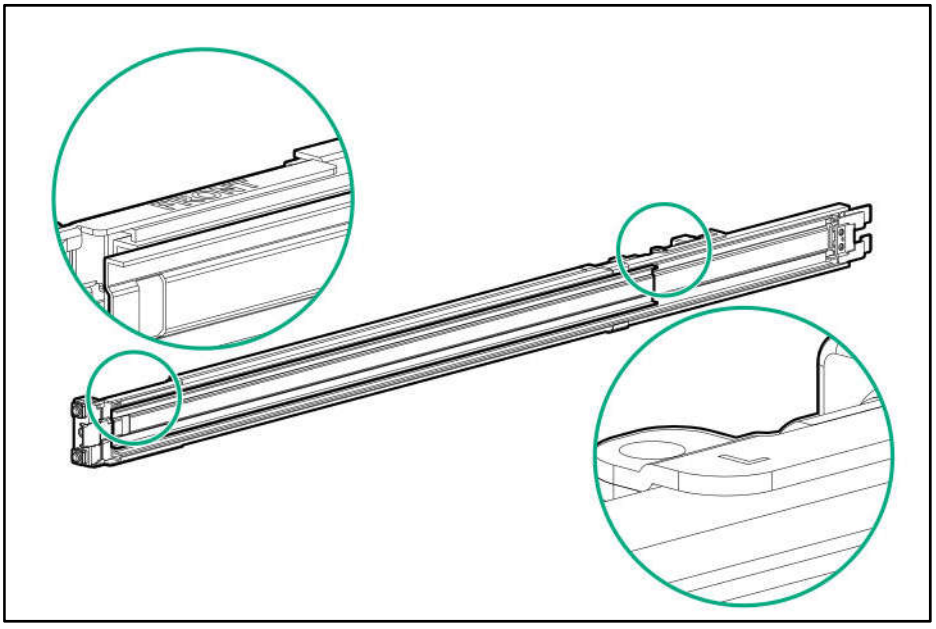
1. Disassemble the inner rails from the rail assembly.
   a. Press the white latch on the inner rail.
   b. Slide out the inner rail to disengage it from the outer rails.



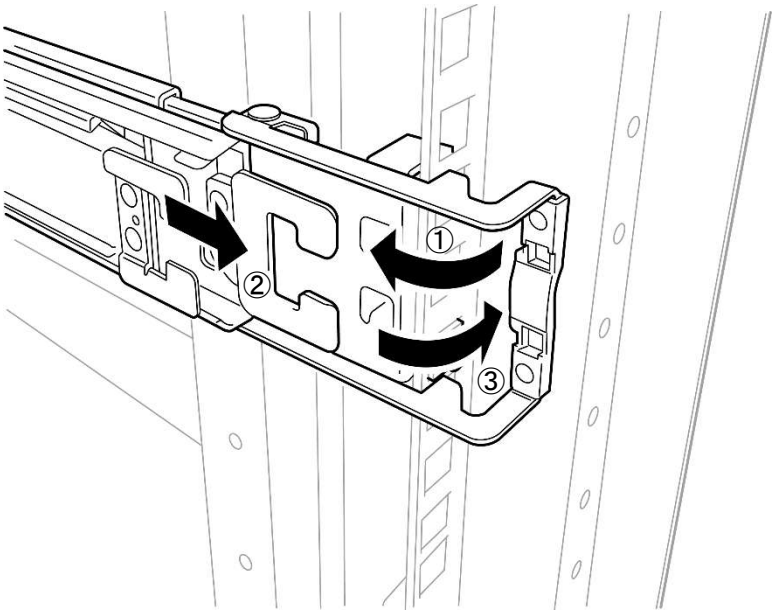
2. Attach the inner rails on both sides of the server tray.



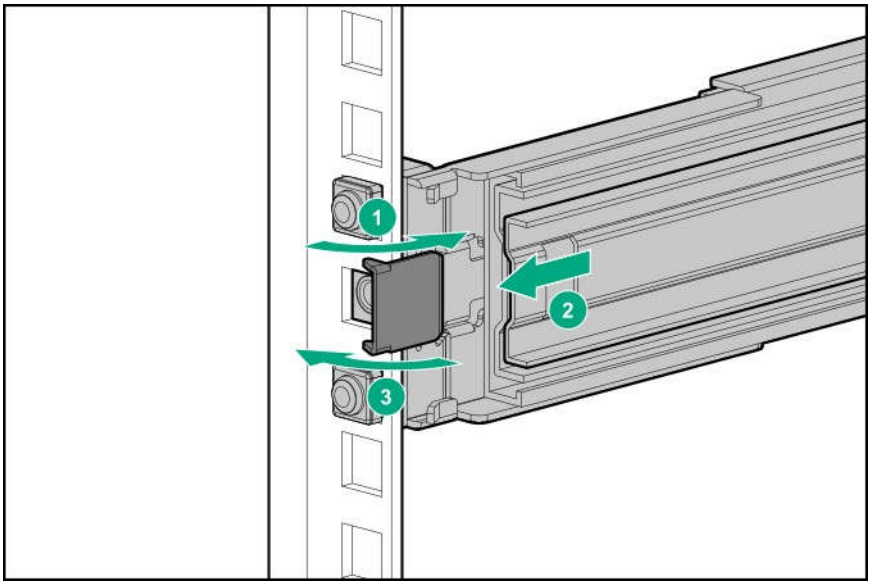
3. If installed, unlock and fully open the server rack door.
4. Check the front, rear, left and right sides of the outer rail to adjust them to each other.



5. Install the rear end of the left outer rail.
   a. Press the latch on the rear rail kit.
   b. Align the pins to the desired position on rack rear column.
   c. Release the latch and the rail gets locked automatically on the rack rear column.

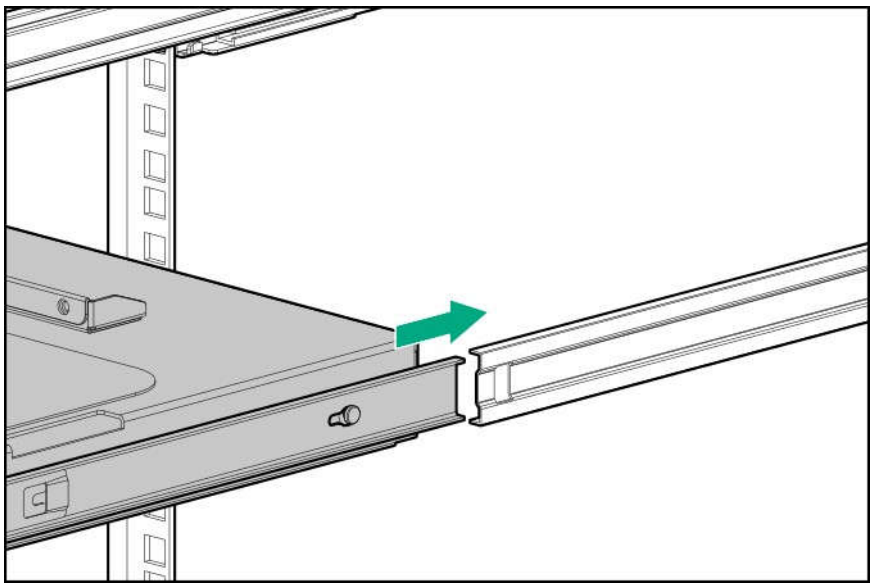


6. Install the front end of the left outer rail.
   a. Press the latch on the front rail kit.
   b. Align the pins to the desired position on rack front column.
   c. Release the latch and the rail gets locked automatically on the rack front column.



7. Install the right outer rail to the same height on the opposite side, in the same installation procedure as the left outer rail.

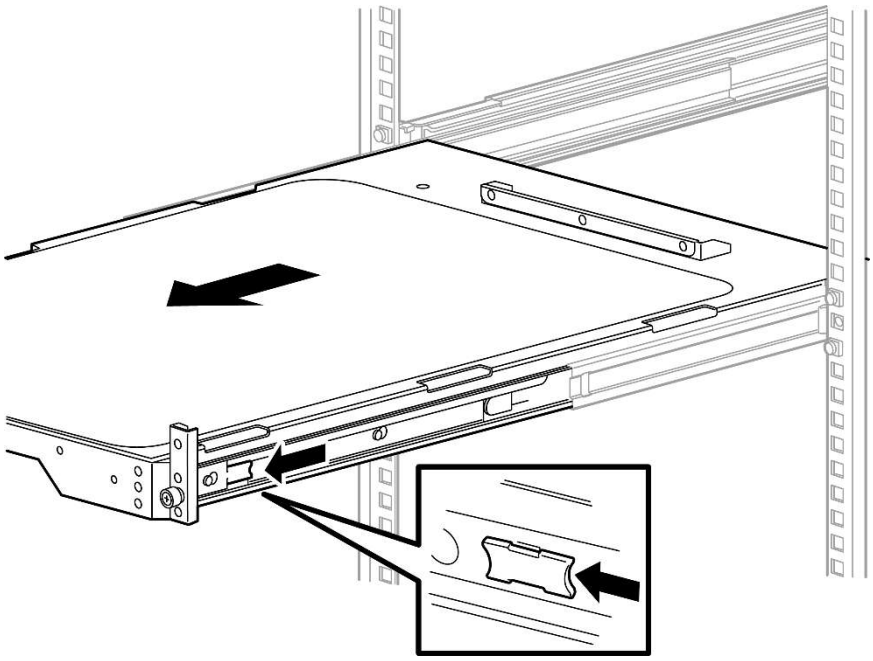
8. Install the tray onto the outer rails in the rack shelf.



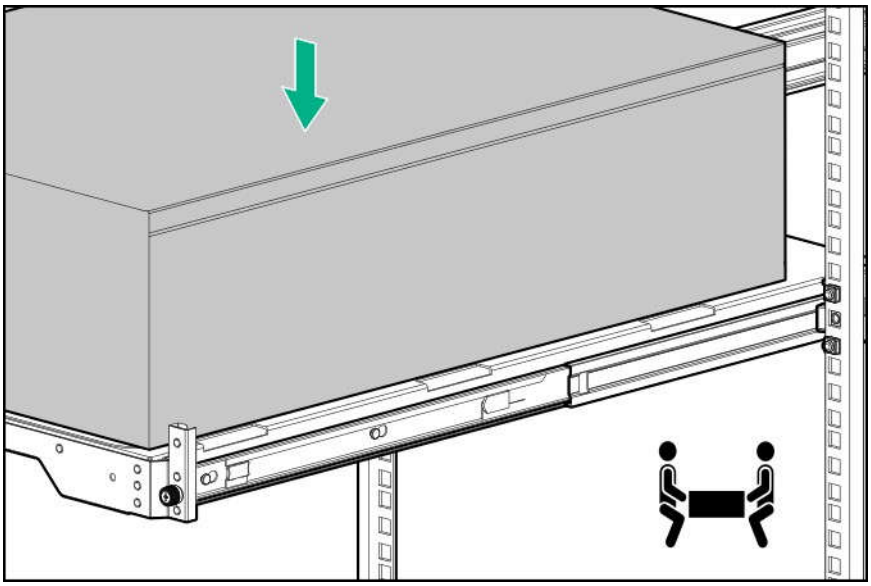
9. Push the tray till it stops midway.

10. Secure the server on the tray.

   a. Press the blue latch on each side of the rails to fully extend the server tray.

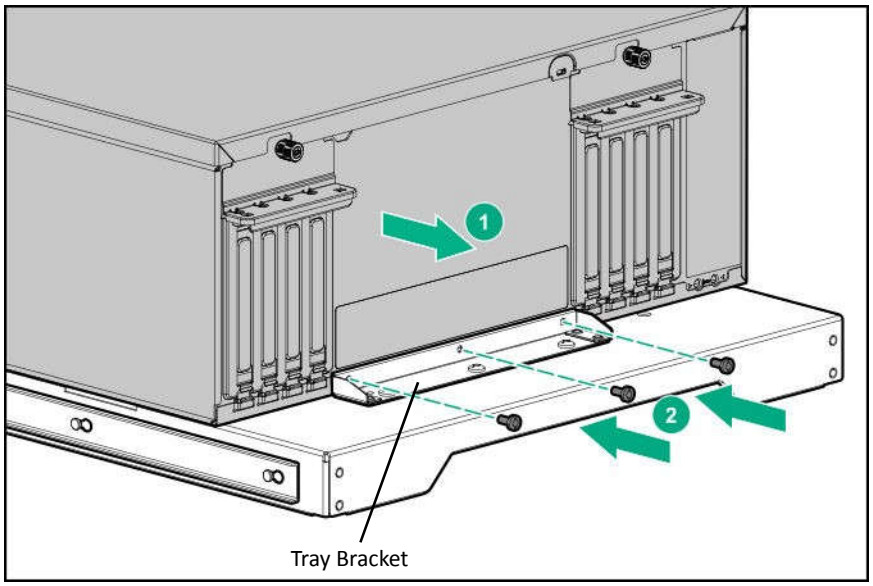


b. Place the server on the tray.

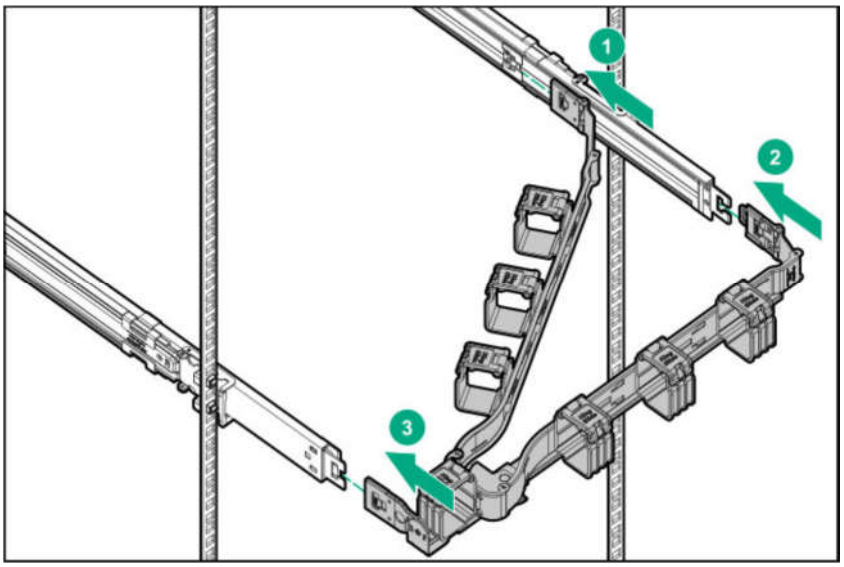


c. Adjust the server position until the rear panel fits perfectly to the tray bracket.

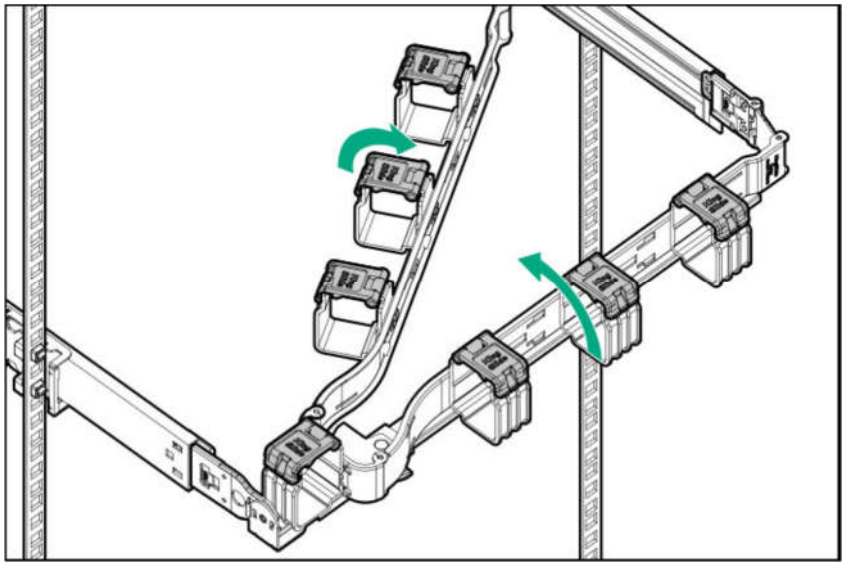
d. Tighten three T-15 screws to firmly secure the server to the tray.



11. Attach the cable management arm to the rail.
    (a) Attach the arm with two latches to the inner and outer rails to the left of the rack.
    (b) Attach the other arm to the outer rail on the right.

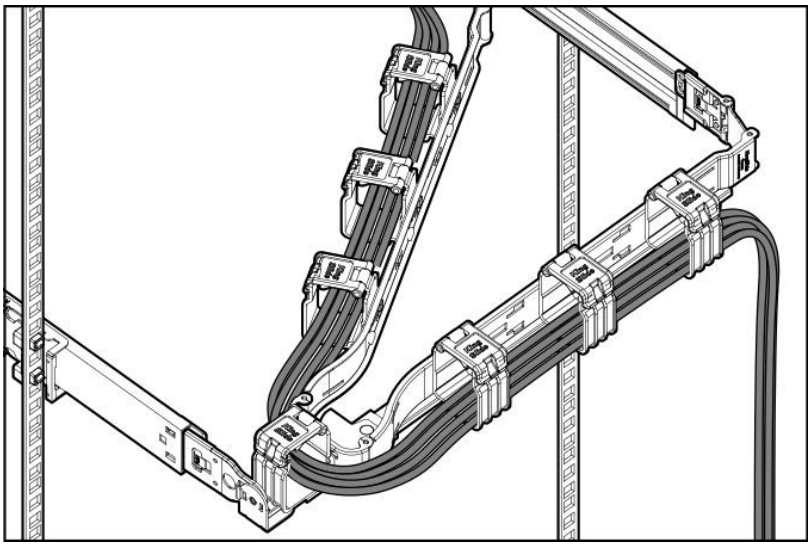


12. Open the cable latch.



13. Connect peripheral devices to the server. For information on identifying the connector, see "Rear Panel Components."

    Close the cable latch to secure the cables to the cable management arm.



14. Check the operation of the rack rail and the cable management arm.

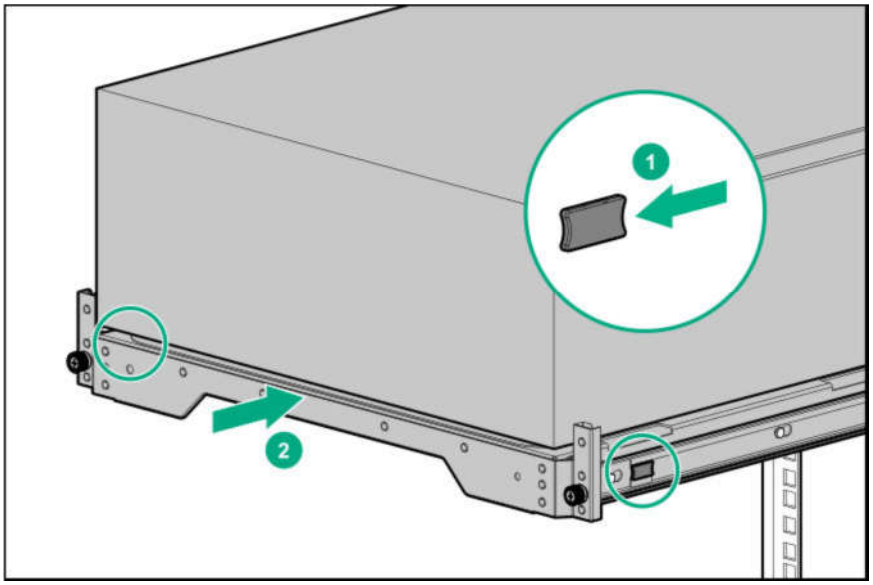
    This operation requires two people. One person to slide the server tray, and another person to observe the cable management arm.

    a. Pull the server tray all the way out from the rack.

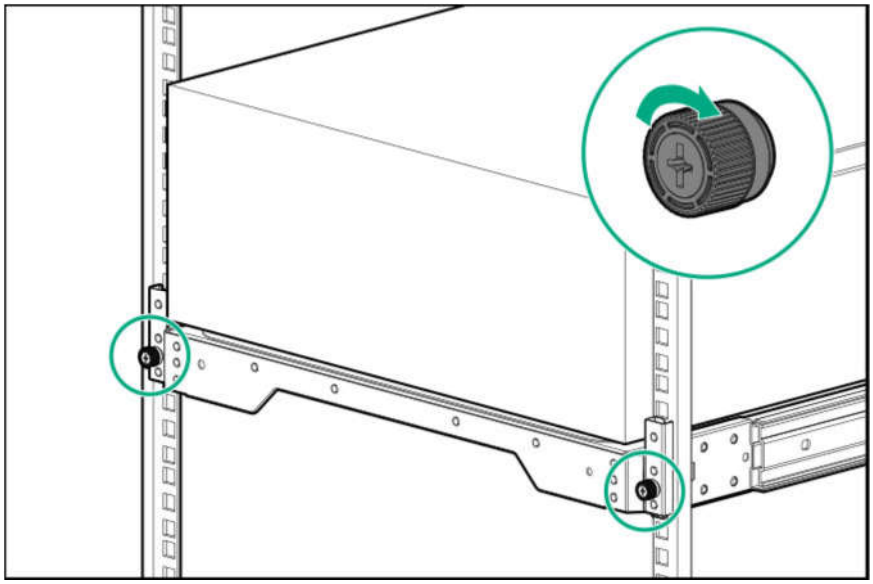
    b. Make sure that the cable is long enough to expand the cable management arm fully without whipping around or getting stuck.

    c. Insert and pull out the server tray to make sure that the cable and the cable management arm is operating correctly.

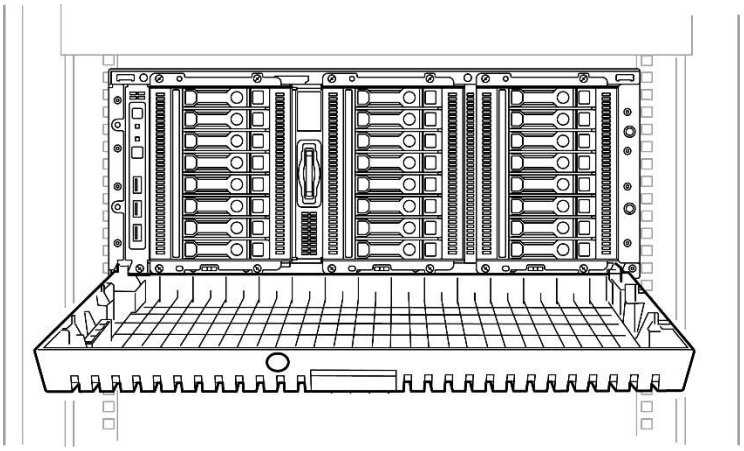
15. Press down on the blue tab to return the server tray on the rack.



16. TIghten the wing screw on the server tray.



17. Attach the front bezel.



2. Installation and Connection

This section describes how to install the server and connect cables.

2.1 Installation

⚠ WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to Safety Precautions and Regulatory Notices.

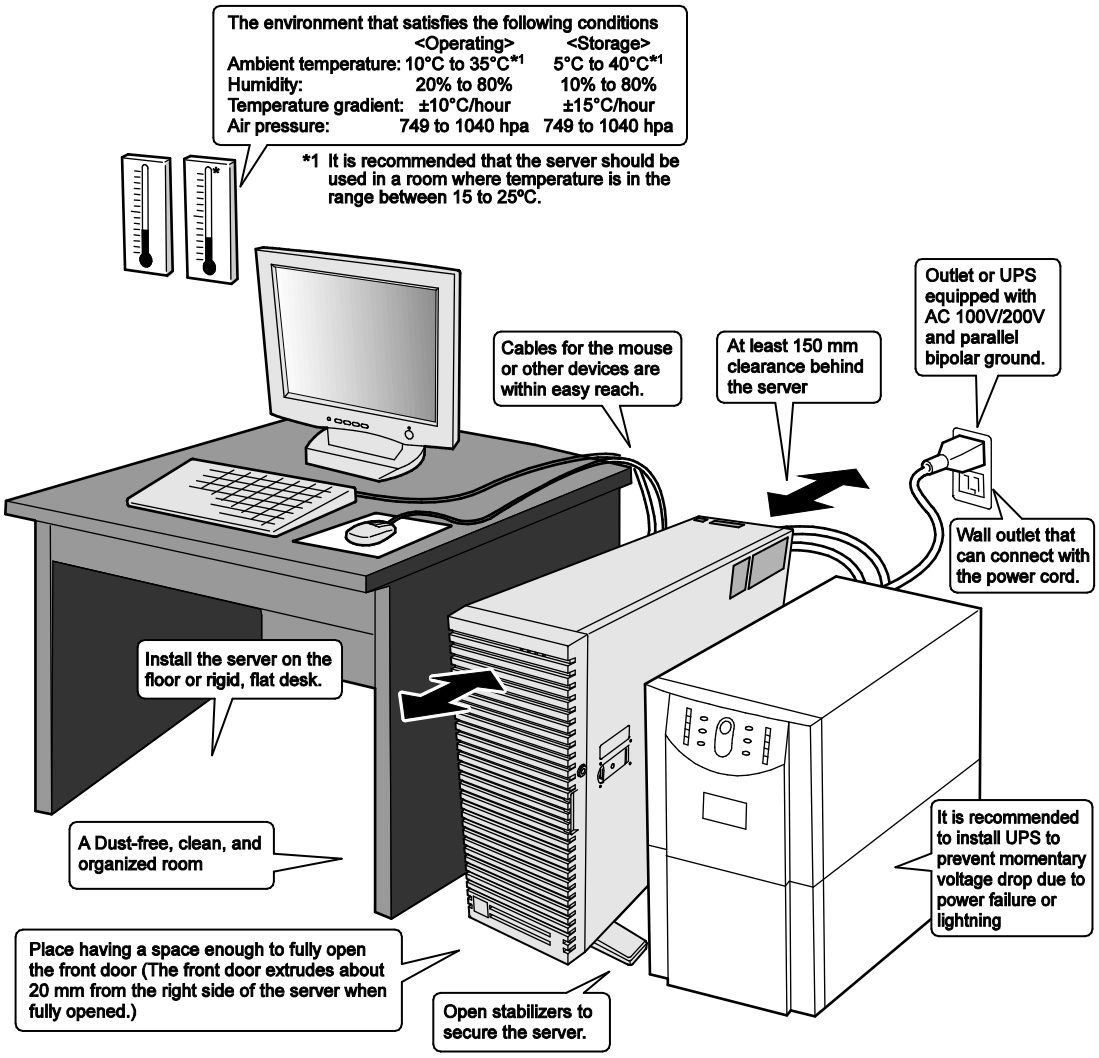
- **Do not use in places other than specified.**
- **Do not connect the ground wire to a gas pipe.**

⚠ 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.

- **Do not carry or install the server only by a single person.**
- **Do not lift hand on the front bezel.**
- **Do not provide the wiring for the server to exceed the rating of the power supply.**
- **Do not install/store in places other than specified.**

The location suitable for installing the unit is as follows:

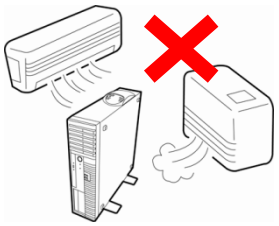


Once the installation location is determined, hold the bottom of the unit securely by two or more persons and put it slowly and gently in the installation location.

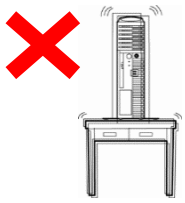
Important

- **Do not lift hands on the front bezel on the front side. The front bezel may come off and fall, causing to equipment damage.**
- **Open the stabilizer, and fix it to the installation location.**
- **Do not hold the handle of the redundant power supply module when carrying it.**

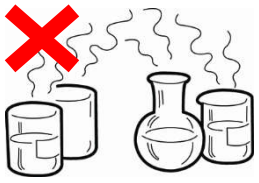
Do not install the server in an environment in which any of the following conditions apply: Installing the server in any of the following conditions will cause the server to malfunction.



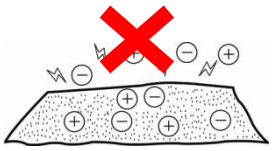
Place of drastic temperature change (near a heater, air conditioner, or refrigerator).



Place where intense vibration may be generated.

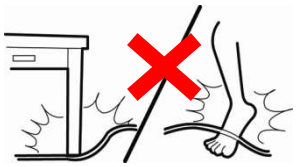


Places where corrosive gas is present (environments where there is sulfur vapor in the atmosphere), or places where chemicals are nearby or may be accidentally sprayed over.

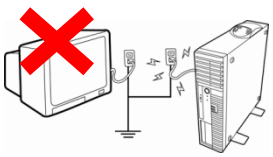


Place where a carpet not subject to anti-static process is laid.

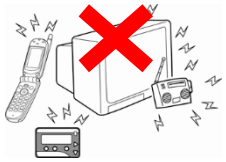
Place where some objects may be fallen.



Places where the power cords or interface cables might be stepped on or tripped over.



Place where the power cord of the server must be connected to an AC outlet that shares the ground wire with another outlet where another device with large power consumption is connected.



Place near a device generating intense magnetic field (such as TVs, radios, broadcast/communication antennas, power transmission wires, and electromagnetic cranes) is placed.

Do not install where there is power supply noise nearby (such as contact sparks when turning power on or off during power relays). (If you must install the server close to such equipment, have your maintenance service company separate power cables or install noise filter.)

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. After connecting peripheral devices, connect the optional power cord supplied with the power supply unit to the unit, and then connect the power plug to the power outlet.

WARNING

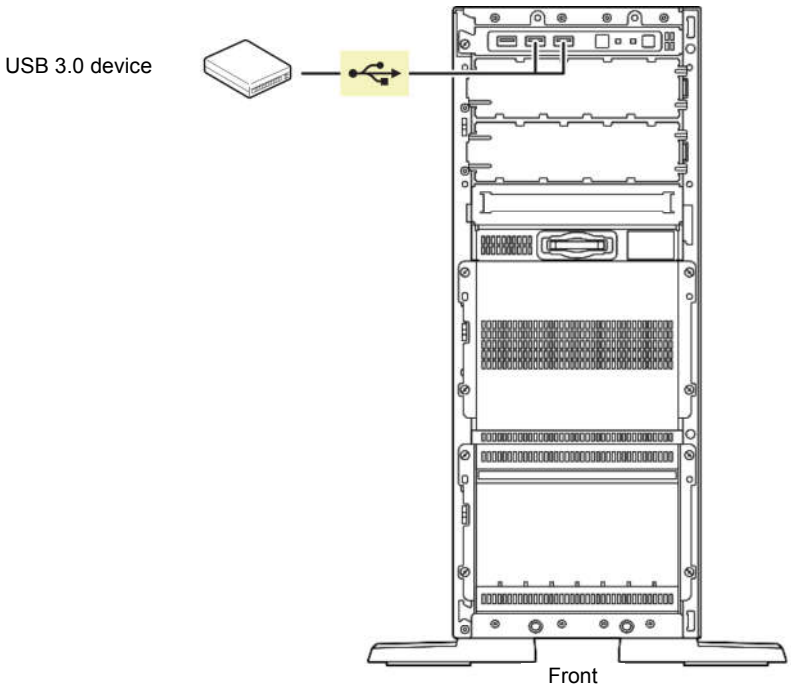
Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to Safety Precautions and Regulatory Notices.

- **Do not hold the power plug with wet hands**
- **Do not connect the ground wire to a gas pipe**

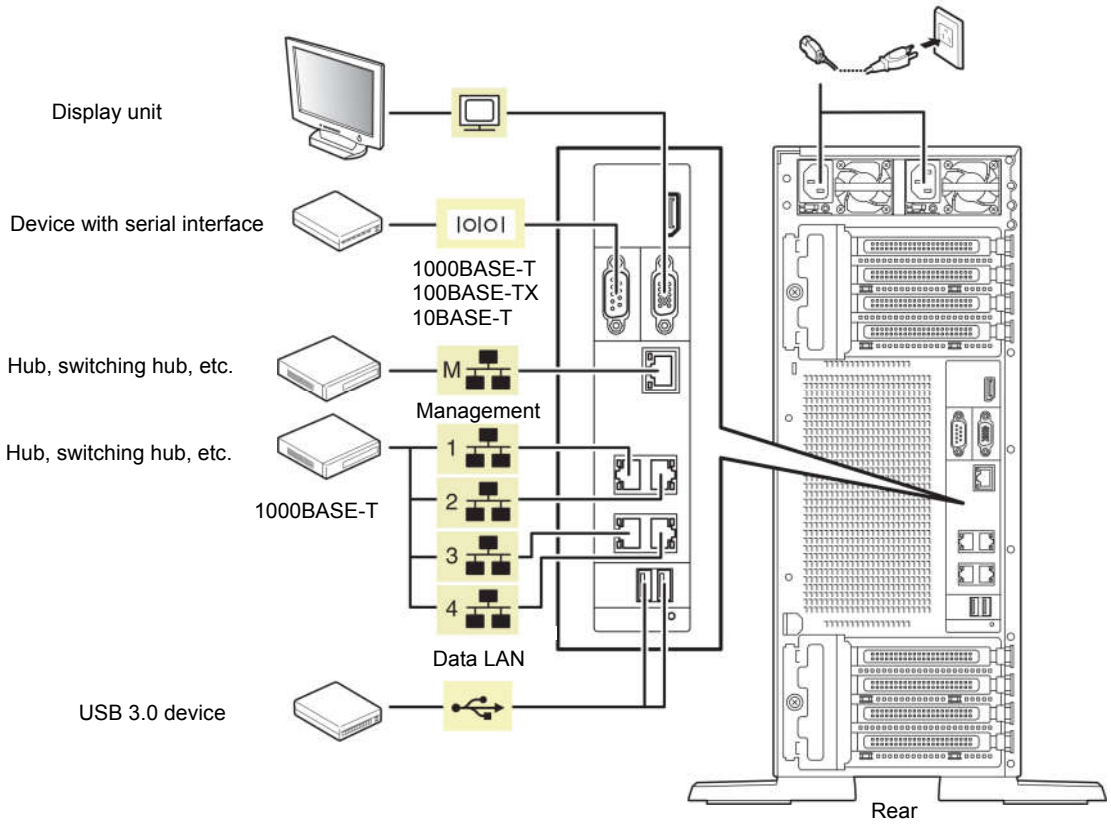
CAUTION

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**



Finally, connect the power cord to the power outlet.
For connecting to UPS, see description in the section 2.2.1.



Note Use a board which applied for certification authority when connecting to communication line.

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.

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))*.

NEC Express5800 Series
Express5800/T120h

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 server.

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.

Tips Wait at least 30 seconds before pressing POWER switch after the server is turned off.

1. Turn on a display, an Uninterruptible Power Supply (UPS), and other peripherals.

   Note Confirm that power supply controller is powered on when the power cord is connected to power supply controller such as Uninterruptible Power Supply (UPS).

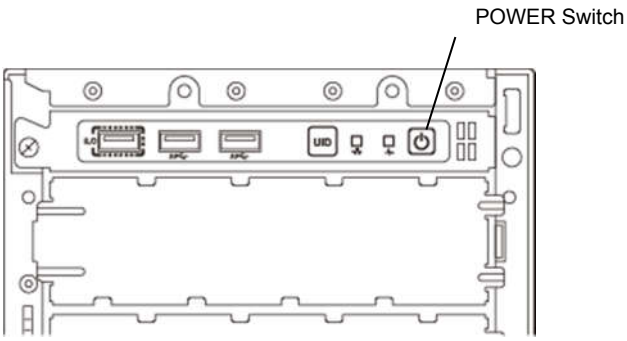
2. Remove Front Bezel.

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.**



While 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
- The server beeps several times while the OS is starting after the server is turned on.
- When any error message is displayed

1.1.1 POST sequence

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 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 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

Error message appears on screen if POST detects an error. For details, see *Chapter 3 (1. IML Error Message)* in "*Maintenance Guide*".

Note

Write down the error message before calling your sales representative. Error messages are useful information for maintenance.

2. System Utility

2.1 Overview

System Utility is a utility to configure basic hardware settings. This utility is installed in the server as standard.

Factory settings of BIOS are set with optimal values. Usually, you do not need to run System Utility to change the BIOS settings. **Modify the settings only at the cases described in *Chapter 3 (2.4 Cases that Require Configuration).***

System Utility includes the following features.

- 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.

For details, see *Chapter 2 (1. System Utilities)* of *Maintenance Guide.*

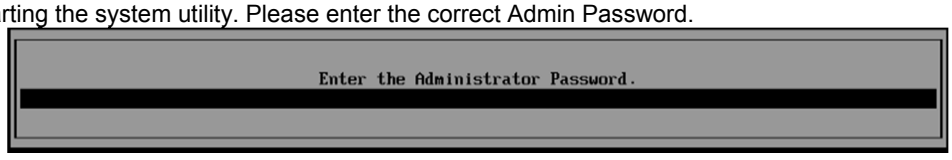
2.2 Starting SETUP Utility

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 varies depending on your system.

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, restart the server.

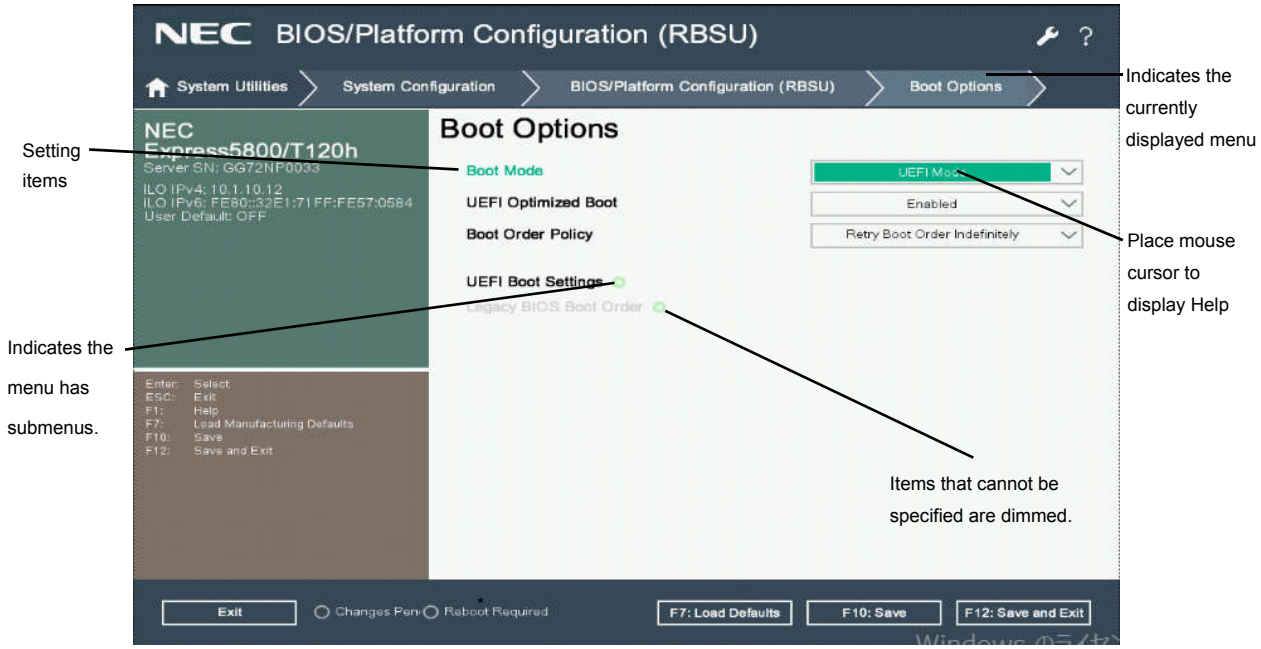
To save your change in System Utility and exit, press <F12> key. In case you cancel your change and exit, press <ESC> key.

Tips

- To put the setting back to the default values, press <F7> key. Execute it under the control of Platform Configuration (RSBU).
- The default values are different from the factory settings.
- **iSCSI Configuration** menu in **Network Options** menu cannot be put back to the default settings.

2.3 Usage of System Utility

Use the following keys to operate System Utility.



☐ Cursor keys (<↑>, <↓>, <←>, <→>)

Selects an item displayed on the screen. Characters of an item are highlighted when the item is currently selected.

☐ <-> key / <+> key

Changes the value of the selected item. You cannot use this key when a menu which has on the left is selected.

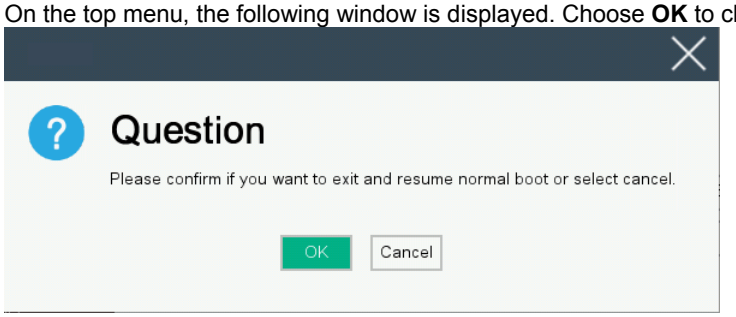
☐ <Enter> key

Determines the selected parameter.

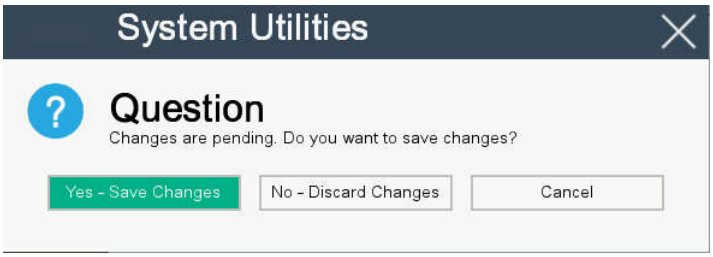
☐ <Esc> key

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**.

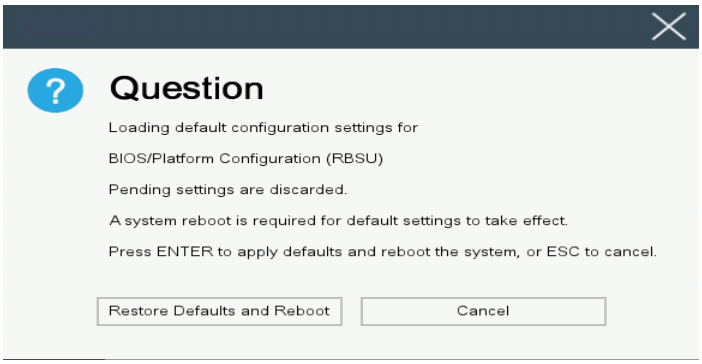


☐ <F1> key

Displays 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

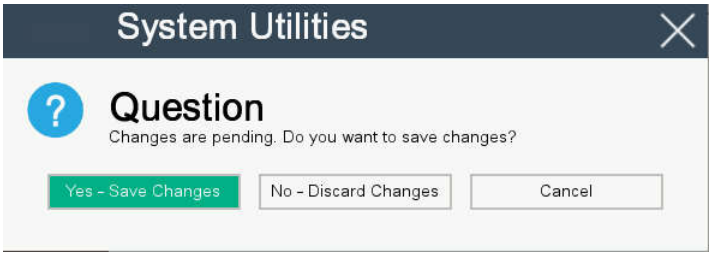
Displays the following screen. To put the parameters of System Utility back to the default setting, select **Restore Defaults and Reboot**. It acts in the same way as [Restore Default System Settings] in [System Default Options] menu. For more details, refer to "*Chapter 2 (1. System Utilities)*" of "*Maintenance Guide*".



Note **iSCSI Configuration** menu in **Network Options** menu cannot be put back to the default settings.

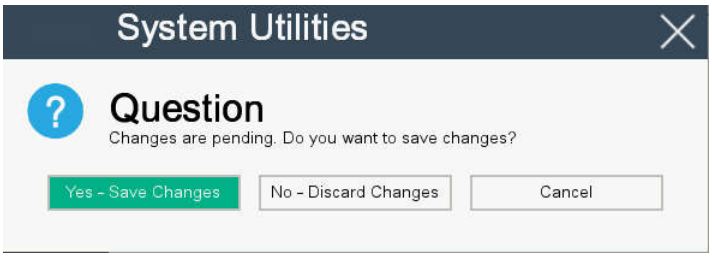
☐ <F10> key

Displays the following screen. To save settings you set, select **Yes**.

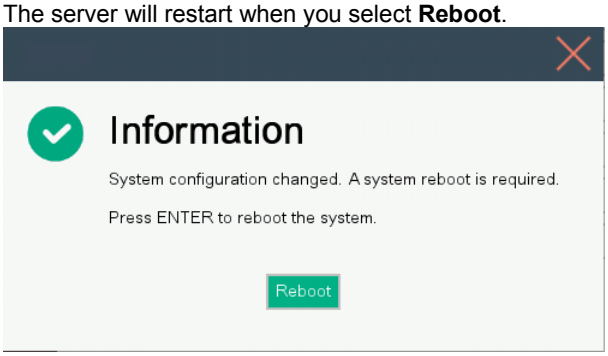


☐ <F12> key

Displays the following screen. When you choose **Yes**, the current settings are saved and then a message urging to restart appears.



The server will restart when you select **Reboot**.



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 Utilities) of Maintenance Guide***.

(1/4)

Category	Description	To be changed	Remark
Settings to be saved in the user default	Items to be set at all times	Set to **Allow Operation with Critical Fan Failure** at **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > Fan and Thermal Options > Fan Failure Policy**.	At the time of shipment, **Fan Failure Policy** is set to **Allow Operation with Critical Fan Failures**.
		Set **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > USB Options > Internal SD Card Slot** to **Disabled**.	At the time of shipment, **Internal SD Card Slot** is set to **Disabled**.
	Setting up the **Time Format** in accordance with your OS	・If you use Windows Set to **Local Time** at **System Configuration > BIOS/Platform Configuration (RBSU) >Date and Time** - **Time Format**. (Included in line 16)	Set up following the pre-install checklists in the installation guide below. For Windows: Chapter 1 Installing Windows
		・If you use Linux Set **System Configuration > BIOS/Platform Configuration (RBSU) > Date and Time** - **Time Format** to **Coordinated Universal Time(UTC)**.	Set up following the pre-install checklists in the installation guide below. For Linux: Chapter 1 Installing Linux
		・If you use another OS Set up following the pre-install checklist in the installation guide of your OS.	
	If you use the ESMPRO/ServerAgent Service	Set to **Disabled** at **System Configuration > BIOS/Platform Configuration (RBSU) > Advanced Options > Fan and Thermal Options > Thermal Shutdown**.	At the time of high temperature, shutdown is executed by ESMPRO/ServerAgent Service.

(2/4)

Category	Description	To be changed	Remark
Basic	Change date and time	Fix the date as follows; **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **Date and Time** - **Date**. Then, fix the time as follows **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **Date and Time** - **Time**	
	Setting up **Time Zone** when **Time Format** is set to **UTC**	・If you use the device in Japan Set **System Configuration > BIOS/Platform Configuration (RBSU) > Date and Time** - **Time Zone** to **UTC+09:00**.	
Memory	Use memory RAS feature	Set **System Configuration > BIOS/Platform Configuration (RBSU)** > **Memory Options** - **Advanced Memory Protection**	Some of RAS features may not be used depending on DIMM configuration.
Optional board	Start the system from installed option board.	Set to **Enabled** in **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **PCIe Device Configuration** > **SlotXX** – **PCIe Option ROM**.	XX is PCI slot number of the installed option board
Boot	Set the Boot Mode to UEFI Mode according to your OS.	Change **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **Boot Options** – **Boot Mode** to **UEFI Mode** *1 ・The following OSs are applicable. ― Windows Server 2012 R2 ― Windows Server 2016 ― VMware ESXi6 ― VMware ESXi6.5	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 **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **Boot Options** – **Boot Mode** to **Legacy BIOS Mode** *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 **Boot Mode** is **UEFI Mode**, change the boot order in **System Configuration** > **BIOS… (RBSU)** > **Boot Options** > **UEFI Boot Settings** - **UEFI boot Order Control** In case **Boot Mode** is **Legacy BIOS Mode**, change the boot order in **System Configuration > BIOS… (RBSU)** > **Boot Options** - **Legacy BIOS Boot Order**.	When you use CD/DVD, set **CD/DVD** to the highest priority.

(3/4)

Category	Description	To be changed	Remark
Boot	Use console redirection feature	Configure in **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **System Options** > **Serial Port Options** > **BIOS Serial Console and EMS**	In console redirection connection, if the corrupted text is displayed on terminal screen, change font type (character code) appropriate to your environment.
	Enable x2APIC feature according to your OS.	**System Configuration** > **BIOS/Platform Configuration (RBSU)** > **Processor Options** - Set **Processor x2APIC Support** to **Enabled** *1 ・The following OSs are applicable. — Red Hat Enterprise Linux 7 (x86_64) — Windows Server 2012 R2 — Windows Server 2016 — VMware ESXi 6 — VMware ESXi 6.5	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 For Linux: Chapter 1 Installing Linux
	Use Wake on LAN (WOL)	Set enable or disable of (a) and (b) below. When using the built-in network controller, the setting in (b) is not reflected. (a) **System Configuration > (Network device) > NIC Configuration** - **Wake On LAN** (b) **System Configuration > BIOS/Platform Configuration (RBSU) > System Options > Server Availability** - **Wake-On LAN** When performing WOL from OS shutdown, set the followings since the setting OS of (a) has a priority. Windows OS: **Device Manager > Device used for WOL under the network adapter > Advanced** – Set **Enable PME** to **Enable**. Set it to **Disable** to disable WOL. Linux OS: Execute the following on the termiana. Execute the following command and check the device name to set up WOL. "/sbin/ifconfig" Enable or disable WOL by using the following command. Enable：" ethtool -s device name wol g" Disable：" ethtool -s device name wol d" The setting of WOL can be checked with the following command. "ethtool device name" In the output information, "Wake-on: g" means Enable and "Wake-on: d" means Disable.	For the WOL support for the optional network card, refer to the user's guide for the optional card.

(4/4)

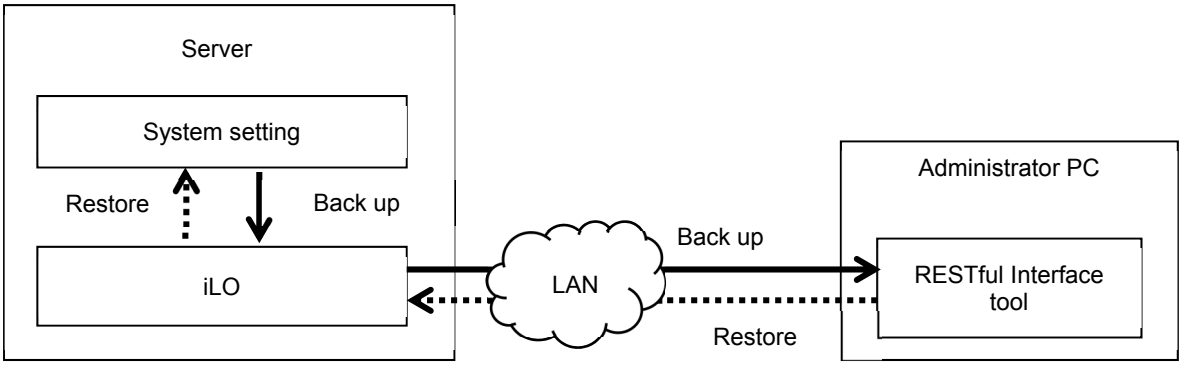
Category	Description	To be changed	Remark
Security	Set a password	Set your password in **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **Server Security** - **Set Admin Password**	If you set your password, you are prompted to enter the password from the next time you start System Utility
	Restrict boot up by entering password	Set your password in **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **Server Security** using **Set Power On Password**	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 **Enabled** in **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **Server Security** - Intel (R) TXT Support.	Do not disable TPM with the TPM management module after setting Intel(R) **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 Power link	When the server is supplied with power from UPS, always turn on the power.	Set to **Always Power On** in **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **System Options** > **Server Availability** - **Automatic Power-On**	If you connect UPS via RS232C, make console redirection setting invalid from System Utility (set to **Disabled** in **BIOS Serial Console Port**).
	If it is turned off by using POWER switch, leave it OFF even when UPS supplies power.	Set to **Restore Last Power State** in **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **System Options** > **Server Availability** - **Automatic Power-On**	
	Keep the power OFF even when UPS supplies power.	Set to **Always Power Off** in **System Configuration** > **BIOS/Platform Configuration (RBSU)** > **System Options** > **Server Availability** - **Automatic Power-On**	

*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 server.

☐ 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 server.

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

iLOrest > 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.

For details of iLO5 features, see *iLO5 User's Guide*.

iLO5 provides the following controls.

Function	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 ESMPRO 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. **Zero Sign In** 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)	✓	✓	✓
Server 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)	✓	✓	✓

* The function does not support depending on server models.

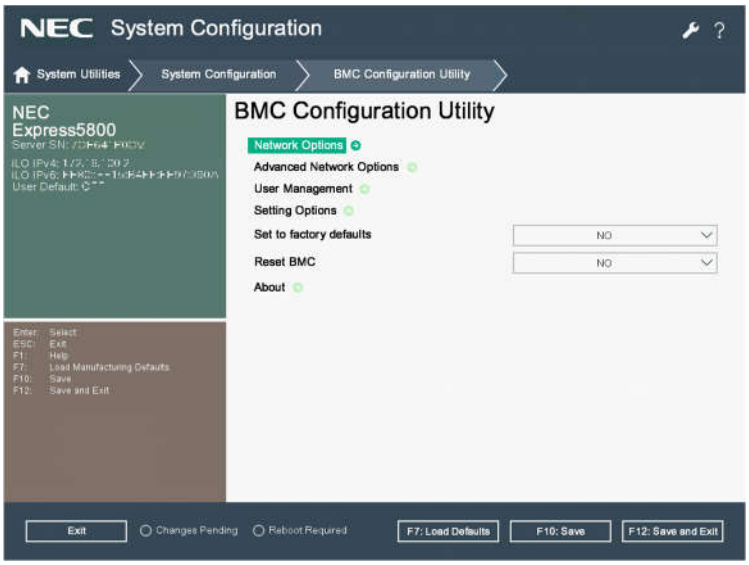
3.3 iLO 5 Network Settings

Take the steps below to use iLO 5 through the 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**.

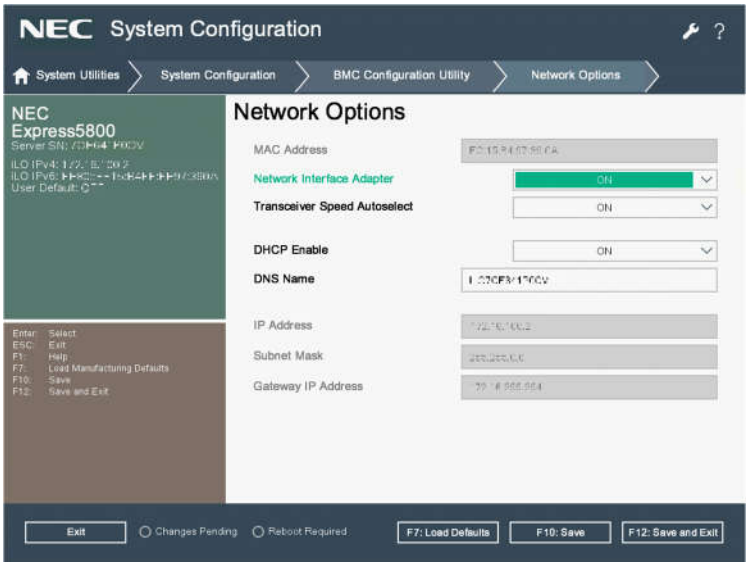


View example when **BMC Configuration Utility** is selected

4. 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

5. On the next screen, use DHCP (Set DHCP 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 user name, password, and DNS name set at the time of shipment. The default user name, 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.

・User name: Administrator

・Password: randomly selected 8 characters including alphabets and numbers

・DNS name: BMCXXXXXXXXXXX (12 Xs is the serial number of server)

If you enter a wrong user name 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 help you to install Windows or maintain the server.

4.1 Features of EXPRESSBUILDER/Starter Pack

Feature	Description
EXPRESSBUILDER	
Setup (OS reinstallation)	Installs Windows or Linux on your server.
Maintenance	Configures system settings and RAID array.
Starter Pack	
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*.

5. Installing Software Components

Continue to install software components such as OS.

See the instructions below.

- Installation Guide (Windows)

6. Turning Off the Server

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 OFF.

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/T120h

4 Appendix

1. Specifications

2. Glossary

3. Revision Record

Ⅰ. Specifications

Product Name				N8100-2640F	N8100-2641F
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"	
	Standard / Maximum			0/2	
Chipset				Intel® C622 Chipset	
Memory	Standard / Maximum			Not included / Registered DIMM: 768GB (24x 32GB), Load Reduced DIMM: 1.5TB (24x 64GB)	
	Memory module			DDR4-2666 Registered DIMM (8/16/32GB), DDR4-2666 Load Reduced DIMM (64GB)	
	Maximum frequency			2666MHz (see *System Configuration Guide* regarding the maximum operation frequency of each CPU)	
	Error Detection and Correction			ECC, x4 SDDC	
	Memory sparing			Available	
	Memory mirroring			Available	
Storage	Drive bay	Built-in	Front	8x 2.5 inch drive	4x 3.5 inch drive
		Built-in (standard)		–	
		Built-in (maximum)		2.5 inch HDD: SAS 43.2TB (24x 1.8TB), SATA 48TB (24x 2TB) 2.5 inch SSD: SAS 23.04TB (24x 960GB) SATA 92.16TB (24x 3.84TB) 2.5 inch PCIe SSD: NVMe (NVM Express) (required an optional HDD cage)	3.5 inch HDD : SAS 120TB (12x 10TB) SATA 120TB (12x 10TB) (required an optional HDD cage)
		Hot-swap		Available	
	Interface / RAID level			SATA 6Gb/s : RAID 0/1/5/6/10/50/60 (optional), SAS 12Gb/s : RAID 0/1/5/6/10/50/60 (optional) SATA 6Gb/s(SW RAID): RAID 0/1/10(On-board)	
	Optical disk drive			Built-in / External (optional) *1	
	FDD			Optional: Flash FDD (1.44MB) *2	
	Expansion bay			2x5.25-type device bay + 1 x DVD bay	
Expansion slots	Supported slots			2x PCI Express 3.0(x8 lanes, x8 sockets) (full-height) 2x PCI Express 3.0(x4 lanes, x8 sockets) (full-height) 4x PCI Express 3.0(x16 lanes, x16 sockets) (full-height)	
				1x PCI Express 3.0(x8 lanes, x8 sockets) (exclusive use for RAID controller)	
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	
Standard interfaces	Front			2x USB3.0 (Type A)、1x iLO USB2.0 (Type A)	
	Rear			2x USB3.0 (Type A) 4x LAN Connector (Compatible with 1000BASE-T) 1x Management Dedicated LAN Connector (Compatible with 1000BASE-T/100BASE-TX/10BASE-T、RJ-45) 1x Serial Port	
	Internal			1x USB3.0 (Type A)、1x iLO USB2.0 (Type A) 1x SATA2.0 (for M.2)、1x SATA2.0 (Optical disc drive or M.2)	
Redundant power supplies				Available (optional, hot-plugged)	
Redundant fans				Available (optional, hot-plugged)	
Dimensions (Width x depth x height)				174.0mm x 648.0mm x 462.5mm(projection not included)	
Weights (Minimum*3 / maximum)				21kg / 41kg	
Power supply units				AC Power Unit (N8181-159, 160) 500W/800W 80 PLUS® Platinum power supply unit (Outlet with two pole parallel earth) (Hot-plugged) (Max:2) AC100-120V/200-240V±10%, 50/60Hz±3Hz (Power code is selectable) AC Power Unit (N8181-161) 800W 80 PLUS® Titanium power supply unit (Outlet with two pole parallel earth) (Hot-plugged) (Max:2) AC200-240V±10%, 50/60Hz±3Hz (Power code is selectable) AC Power Unit (N8181-162) 1600W 80 PLUS® Platinum power supply unit (Outlet with two pole parallel earth) (Hot-plugged) (Max:2) AC200-240V±10%, 50/60Hz±3Hz (Power code is selectable) DC Power Unit (N8181-163) 800 W DC-48V power (Outlet with two pole parallel earth) (Hot-plugged) (Max:2) (Power code is selectable) DC Power Unit (N8181-164) 800W DC 380V power (Outlet with two pole parallel earth) (Hot-plugged) (Max:2) (Power code is selectable)	
Environmental conditions				Operating: 10～35℃/8～90% Storage: －30～60℃/5～95%(both during operation and in storage, avoid condensation)	
Accessories				Startup guide, Safety Precautions and Regulatory Notices, Front Bezel	
Bundled OS				–	

Product Name	N8100-2640F	N8100-2641F
Supported OS	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 (x86_64) or later VMware ESXi™ 6.0 Update 3 or later VMware ESXi™ 6.5 Update 1 or later	

*1 Recommended at least one DVD drive per system

*2 USB flash drive for compatible with FDD

*3 Operable minimum constitution (1x CPU, 1x DIMM, 1x HDD, 1x Power unit)

On-board CPU

On-boardCPU、 Operation Frequency Number of cores(C)/Threads(T) (1CPU) Intel Smart Cache(Last Level Cache) MB **TDP** （Thermal Design Power） Maximum heat radiationW	Intel® Xeon® Processor Scalable Family Xeon Bronze 3104 Processor (1.70 GHz, 6C/6T, 8.25MB, TDP 85W)*4, Xeon Bronze 3106 Processor (1.70 GHz, 8C/8T, 11MB, TDP 85W)*4, Xeon Silver 4108 Processor (1.80 GHz, 8C/16T, 11MB, TDP 85W)*4, Xeon Silver 4110 Processor (2.10 GHz, 8C/16T, 11MB, TDP 85W)*4, Xeon Silver 4112 Processor (2.60 GHz, 4C/8T, 8.25MB, TDP 85W)*4, 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)*4, 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)*4, Xeon Gold 5120 Processor (2.20 GHz, 14C/28T, 19.25MB, TDP 105W)*4, 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)*4, 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)*4, 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)*4, Xeon Gold 6136 Processor (3 GHz, 12C/24T, 24.75MB, TDP 150W), Xeon Gold 6138 Processor (2GHz, 20C/40T, 27.50MB, TDP 125W)*4, Xeon Gold 6140 Processor (2.30 GHz, 18C/36T, 24.75MB, TDP 140W)*4, 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)*4, 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)*4, Xeon Platinum 8156 Processor (3.60 GHz, 4C/8T, 16.50MB, TDP 105W)*4, Xeon Platinum 8158 Processor (3GHz, 12C/24T, 24.75MB, TDP 150W)*4, Xeon Platinum 8160 Processor (2.10 GHz, 24C/48T, 33MB, TDP 150W)*4, Xeon Platinum 8164 Processor (2GHz, 26C/52T, 35.75MB, TDP 150W)*4, 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)*4, 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)*4, Xeon Gold 6142M Processor (2.60 GHz, 16C/32T, 22MB, TDP 150W)*4, Xeon Platinum 8160M Processor (2.10 GHz, 24C/48T, 33MB, TDP 150W)*4, Xeon Platinum 8170M Processor (2.10 GHz, 26C/52T, 35.75MB, TDP 165W)*4, Xeon Platinum 8176M Processor (2.10 GHz, 28C/56T, 38.50MB, TDP 165W)*4, Xeon Platinum 8180M Processor (2.50 GHz, 28C/56T, 38.50MB, TDP 205W)*4

*4: These CPU will not be supported and shipped to Taiwan clients.

2. Glossary

Term	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.
SPP	Standard Program Package (SPP) is a software package that includes BIOS, FW, driver, and other basic software. SPP is included in Starter Pack.

Term	Description
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.

3. Revision Record

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NEC Express Server

Express5800/T120h

User's Guide

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