

# User's Guide

NEC Express Server  
Express5800 Series

## **Express5800/R120g-2E EXP330A**

**Chapter 1 General Description**



**Chapter 2 Preparations**





**Chapter 3 Setup**

**Chapter 4 Appendix**







# Manuals

Manuals for this product are provided as booklets (📖) and electronic manuals (📄) in EXPRESSBUILDER.

	Safety Precautions and Regulatory Notices	Describes points of caution to ensure the safe use of this server. <b><u>Read these cautions before using this server.</u></b>
	Getting Started	Describes how to use this server, from unpacking to operations. See this guide first and read the outline of this product.

EXPRESSBUILDER		
	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 BIOS 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, Universal RAID Utility, and other bundled software
	Maintenance Guide	
	Chapter 1: Maintenance	Server maintenance and troubleshooting
	Chapter 2: Useful Features	The detail of system BIOS settings, RAID Configuration Utility, and EXPRESSBUILDER
	Chapter 3: Appendix	Error messages and Windows Event Logs
	Other manuals	
	The detail of NEC ESMPRO, Universal RAID Utility, and other features	

# Contents

Manuals .....	2
Contents .....	3
Conventions Used in This Document .....	6
Signs and symbols for safety .....	6
Notations used in the text.....	7
Optical disk drive.....	7
Hard disk drive .....	7
Removable media .....	7
Abbreviations of Operating Systems (Windows) .....	8
POST .....	8
BMC .....	8
Trademarks .....	9
License Agreement Notice.....	10
Warnings and Additions to This Document .....	13
Latest editions .....	13
Safety notes .....	14
Handling precautions .....	15
<b>Chapter 1</b> General Description.....	17
<b>1.</b> Introduction .....	18
<b>2.</b> Accessories.....	19
<b>3.</b> Features.....	20
<b>3.1</b> Firmware and Software Version Management .....	23
<b>4.</b> Names and Functions of Parts .....	24
<b>4.1</b> Front View (With Front Bezel).....	24
<b>4.2</b> Front View (Without Front Bezel).....	26
<b>4.3</b> Rear View .....	28
<b>4.4</b> External View.....	29
<b>4.5</b> Internal View .....	30
<b>4.6</b> Motherboard .....	31
<b>4.7</b> Status Indicators .....	33
4.7.1 POWER LED (  ).....	33
4.7.2 STATUS LED 1, 2 (  ).....	33
4.7.3 LINK/ACT LED (  ,  ,  ).....	35
4.7.4 Optical Disk Drive Access LED (option).....	35
4.7.5 UID LED (ID).....	35
4.7.6 Power Capping LED .....	35
4.7.7 LED on a hard disk drive .....	36
4.7.8 LEDs for LAN connectors .....	37
4.7.9 AC POWER LED on Power Unit.....	38
4.7.10 Global HDD LED1,2(1-  -2).....	39

<b>Chapter 2</b>	<b>Preparations</b>	<b>40</b>
<b>1.</b>	<b>Installing Internal Optional Devices</b>	<b>41</b>
1.1	Safety Precautions	41
1.2	Anti-static Measures	42
1.3	Overview of Installation and Removal	43
1.4	Confirming Servers (UID Switch)	45
1.5	Removing Front Bezel	46
1.6	Removing Top Cover	48
1.7	Removing Support Bar	49
1.8	Removing Air Duct	50
1.9	TPM Kit	51
1.9.1	Installation	51
1.10	Processor (CPU)	52
1.10.1	Maximum number of processor cores supported by this server	52
1.10.2	Installation	53
1.10.3	Replacement / Removal	57
1.11	DIMM	58
1.11.1	Maximum supported memory size	59
1.11.2	Memory clock	60
1.11.3	Memory RAS feature	61
1.11.4	DIMM installation order	62
1.11.5	Installation	64
1.11.6	Removal / Replacement	65
1.11.7	Cluster On Die and Early Snoop features	66
1.11.8	Using Memory RAS feature	69
1.12	Flash Backup Unit for RAID Controller	79
1.12.1	Handling precautions	79
1.12.2	Installation	79
1.12.3	Removal	82
1.13	Additional / Redundant Fan Unit	83
1.13.1	Installation	84
1.13.2	Replacement / Removal	84
1.14	Backup Device	85
1.14.1	Installation	85
1.14.2	Removal	87
1.15	PCI Card	88
1.15.1	Notes	88
1.15.2	Supported PCI cards and available slots	89
1.15.3	Installation	91
1.15.4	Removal	92
1.15.5	Installing RAID Controller	92
1.16	Additional 2.5-inch HDD Cage	93
1.16.1	Installation	93
1.16.2	Removal	99
1.17	Additional 2.5-inch HDD Cage (Rear)	100
1.17.1	Installation	100
1.17.2	Removal	104
1.18	2.5-inch PCIe SSD Installation Kit	105
1.18.1	Installation	105
1.18.2	Removal	116
1.19	Optical Disk Drive	117
1.19.1	Installation	117
1.19.2	Removal	118
1.20	Use of Internal Hard Disk Drives in the RAID System	119
1.20.1	Connecting cables	120
1.20.2	Notes on Building RAID System	128
1.21	Installing Air Duct	129
1.22	Installing Support Bar	129
1.23	Installing Top Cover	129



<b>1.24</b> 2.5-inch Hard Disk Drive .....	130
1.24.1 Installation .....	130
1.24.2 Removal .....	132
1.24.3 Replacing a hard disk drive in the RAID System (Auto Rebuild) .....	132
<b>1.25</b> 3.5-inch Hard Disk Drive .....	133
1.25.1 Installation .....	133
1.25.2 Removal .....	135
1.25.3 Replacing a hard disk drive in the RAID System (Auto Rebuild) .....	135
<b>1.26</b> Power Supply Unit .....	136
1.26.1 Cold Redundant Feature .....	136
1.26.2 Installation .....	137
1.26.3 Replacing a failed power supply unit .....	138
<b>1.27</b> Installing Front Bezel .....	139
<b>2.</b> Installation and Connection .....	140
<b>2.1</b> Installation .....	140
2.1.1 Installing Rack .....	140
2.1.2 Installing the server to the rack or removing it from the rack .....	142
<b>2.2</b> Connection .....	149
2.2.1 Connecting to Uninterruptible Power Supply (UPS) .....	152
<b>Chapter 3</b> Setup .....	153
<b>1.</b> Turning on the Server .....	154
<b>1.1</b> POST .....	155
1.1.1 POST sequence .....	155
1.1.2 POST error messages .....	157
<b>2.</b> BIOS Setup Utility (SETUP) .....	158
<b>2.1</b> Overview .....	158
<b>2.2</b> Starting SETUP Utility .....	158
<b>2.3</b> Description on On-Screen Items and Key Usage .....	159
<b>2.4</b> Cases that Require Configuration .....	161
<b>2.5</b> BIOS setting by network .....	163
2.5.1 Overview .....	163
2.5.2 Backing up the BIOS setting .....	164
2.5.3 Restoring the BIOS setting .....	164
2.5.4 Notes .....	166
<b>3.</b> EXPRESSSCOPE Engine 3 .....	167
<b>3.1</b> Overview .....	167
<b>3.2</b> EXPRESSSCOPE Engine 3 Network Configuration .....	167
<b>4.</b> EXPRESSBUILDER .....	169
<b>4.1</b> Features of EXPRESSBUILDER .....	169
<b>4.2</b> Usage of EXPRESSBUILDER .....	169
<b>5.</b> Installing Software Components .....	170
<b>6.</b> Turning Off the Server .....	171
<b>Chapter 4</b> Appendix .....	172
<b>1.</b> Specifications .....	173
<b>2.</b> Interrupt Lines .....	179
<b>3.</b> Glossary .....	180
<b>4.</b> Revision Record .....	181

# Conventions Used in This Document

## Signs and symbols for safety

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



Indicates there is a risk of death or serious personal injury

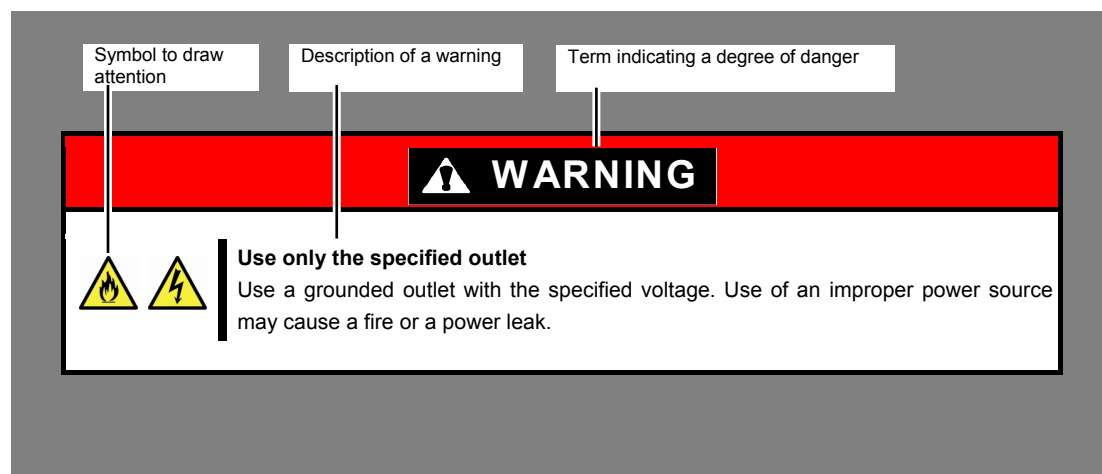


Indicates there is a risk of burns, other personal injury, or property damage

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

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

(Example in this guide)



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## Notations used in the text

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

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

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## Optical disk drive

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

- DVD-ROM drive
- DVD Super MULTI drive

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## Hard disk drive

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Unless otherwise stated, *hard disk drive* (HDD) described in this document refers to both of the following.

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

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## Removable media

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Unless otherwise stated, *removable media* described in this document refers to both of the following.

- USB flash drive
- Flash FDD

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## Abbreviations of Operating Systems (Windows)

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Windows Operating Systems are referred to as follows.

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

Notations in this document	Official names of Windows
Windows Server 2012 R2	Windows Server 2012 R2 Standard
	Windows Server 2012 R2 Datacenter
Windows Server 2012	Windows Server 2012 Standard
	Windows Server 2012 Datacenter
Windows Server 2008 R2	Windows Server 2008 R2 Standard
	Windows Server 2008 R2 Enterprise

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## POST

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*POST* described in this document refers to the following.

- Power On Self-Test

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## BMC

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*BMC* described in this document refers to the following.

- Baseboard Management Controller

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### Latest editions

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

The most recent version of User's Guide, as well as other related documents, is also available for download from the following website.

<http://www.nec.com/>

Safety notes

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

Warning labels are attached on or near the components with potential hazards. These labels are attached or printed on the components.

Do not remove or black out these labels and keep them clean. If no labels are attached or printed on the server, contact your sales representative.

⚠ 注意 CAUTION ATTENTION	
<p>高温になるコンポーネントがあります。十分に冷えてから触れるようにして下さい。</p> <p>As some components may become very hot during system operation, give ample time to allow cooling as well as use precaution when handling internal components immediately after powering down.</p> <p>有的部件可能会达到高温。请注意等待其冷却之后再接触。</p> <p>有的部件可能继续达到高温。请注意等待冷却之后再接触。</p> <p>Comme certains composants peuvent se réchauffer beaucoup pendant le fonctionnement du système, laissez-les se refroidir suffisamment et faites bien attention lorsque vous manipulez les composants internes juste après avoir désactivé le système.</p>	<p>ネジは本体内部へ落とさない様、十分に注意下さい。</p> <p>Do not drop any screws inside the system.</p> <p>请一定注意不要将螺丝掉入设备内部。</p> <p>请注意避免将螺丝掉入设备内部。</p> <p>Ne laissez tomber aucune vis à l'intérieur du système.</p>
<p>電源を切ってもバッテリーで稼働している部分があります。</p> <p>Some internal components may still be operational on battery power. Refer to instruction manuals for this system as well as options prior to maintenance.</p> <p>即使切断电源，有的部件也会依靠电池运转。在进行维护之前，请认真阅读各组件的使用说明书。</p> <p>即使切断电源，有的部件也会依靠电池运转。在进行维护之前，请认真阅读各组件的使用说明书。</p> <p>Quelques composants internes peuvent encore continuer à fonctionner avec l'alimentation de la batterie. Référez-vous aux manuels d'instruction pour ces systèmes aussi bien que les dispositifs en options avant d'effectuer les travaux d'entretien.</p>	<p>ボード及びオプション機器の接続の際は、必ずユーザガイドを参照し、正しく接続して下さい。</p> <p>誤った接続は、故障や火災の原因となります。</p> <p>Refer to the "User's Guide" when option board or peripherals are installed.</p> <p>Incorrect installations may result in damage to the system and lead to accidents.</p> <p>连接板卡及可选设备时，请务必参阅“用户指南”进行正确连接。</p> <p>连接错误，有可能造成故障或火灾。</p> <p>Référez-vous au «Guide de l'Utilisateur» lorsque des cartes en option ou des périphériques sont installés. Une installation incorrecte risque d'endommager le système et de causer des accidents.</p>
<p>オプションの取り付け、取り外し時はすべての電源プラグをコンセントから抜き、</p> <p>Disconnect all AC power cords from both system and external peripherals prior to installing/removing options.</p> <p>进行可选配件的安装和拆卸时，请从插座取下全部的电源插头并分离与外部设备间的连接。断电后再进行设备操作有电击、短路及火灾危险。</p> <p>进行可选配件的安装和拆卸时，请从插座取下全部的电源插头并分离与外部设备间的连接。</p> <p>Déconnectez tous les câblés CA du système et des périphériques externes avant d'installer/d'enlever les dispositifs en option.</p>	<p>傷をばさんだり、ぶつたりしないように注意して下さい。</p> <p>To avoid the risk of personal injury, be careful when accessing the inside of the system.</p> <p>请小心不要受伤或碰伤于板。</p> <p>请小心不要受伤或碰伤于板。</p> <p>Pour éviter tout risque de blessure, faites attention en accédant à l'intérieur du système.</p>
	<p>搬運の持ち上げ、移動の際は、設置の底面をしっかりと持ち上げて下さい。</p> <p>Firmly hold the bottom of the system when required to lift and carry the system.</p> <p>抬起、移动设备时，请牢固抓住设备底部将其抬起。</p> <p>抬起、移动设备时，请牢固抓住设备底部将其抬起。</p> <p>Saisissez fermement le fond du système au cas où vous devez soulever et transporter le système.</p>

**注意重物**  
**WARNING: HEAVY ITEM**  
**AVERTISSEMENT: ARTICLE Lourd**

为了防止腰肌受损以及设备  
失手落下，移动设备时请一  
定由2人以上进行。  
为了防止腰部受伤以及设备  
掉落，移动伺服器时请由2  
人以上进行。

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.

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## Handling precautions

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 cell phone or PHS and switch off them near the server. Electric waves from such devices can cause server to malfunction.
- Install the server in an appropriate place. For details about the installation location, see *Chapter 2 Preparations (2. Installation and Connection)*.
- Before connecting/removing cables to/from peripheral devices, make sure that the server is off and unplug the power cord, if they are non plug-and-play devices.
- Connect the provided power cord to a 100/200 VAC outlet.
- Make sure that the access LED on the server is off before turning off the power or ejecting an optical disk.
- Wait for at least 30 seconds before connecting power cord to power outlet after disconnecting it.
- If any Uninterruptible Power Supply (UPS) unit is connected, set it to wait for at least 30 seconds before turning on the server after power off.
- Do not press the POWER switch to turn on the server before the STATUS LED1, 2 (amber) is unlit.
- Wait for at least 30 seconds before turning on the server after turning off the server.
- 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.
- Momentary voltage drop may occur due to lightning strike. To prevent this, use of UPS is recommended.
- Any copy-protected CD that does not conform to standards is not supported.
- In the following cases, check and adjust the system clock before operation.
  - After transportation
  - After storage
  - After a period of disuse in which storage conditions did not conform to those at which server operations are guaranteed (Temperature: 5°C to 40°C [5°C to 45°C when an option is installed, subject to restrictions on the configuration], Humidity: 20% to 80%)
- 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: –10°C to 55°C, Humidity: 20% to 80%, No condensation of moisture) to store the server.
- Do not power off or reset the server, nor disconnect the power cord before POST completes.
- 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
- 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

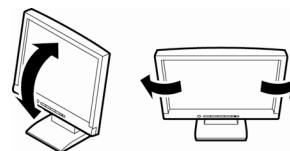
The basic body position for using a computer is sitting straight with your hands on the keyboard parallel with the floor, and your eyes directed slightly downward toward the monitor. With the proper posture described above, no unnecessary strain is applied on any part of your body, in other words when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



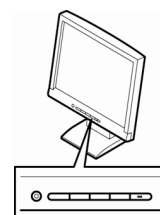
### Adjust the angle of your display

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.



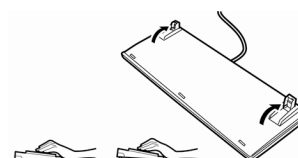
### Adjust the brightness and contrast of the display

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/R120g-2E

# 1

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## General Description

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

### 1. Introduction

### 2. Accessories

Describes the accessories of the server.

### 3. Features

Describes the features of the server and server management.

### 4. Names and Functions of Parts

Describes the name of each part contained in this server.

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# **1. Introduction**

---

Thank you for purchasing this NEC Express5800 Series product.

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

NEC's latest technology and architectures realize high-power and high-speed operation that cannot be matched by existing servers.

The server is designed with consideration of not only reliability but also expandability, which enables you to use it as a network server.

Read this document before using the server thoroughly to fully understand handling of Express5800 Series Server and appreciate its functions to the maximum extent.

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## 2. Accessories

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

- **Front Bezel**
- **Bezel Lock Key (attached to Front Bezel)**
- **Slide Rails**
- **Safety Precautions and Regulatory Notices**
- **Getting Started**
- **SAS cable (RAID controller is unmounted)**
- **Fixing screws for internal backup device<sup>\*1</sup>**

<sup>\*1</sup> Only included with 16x2.5-inch drive models.

Make sure you have all accessories and inspect them. If an accessory is missing or damaged, contact your sales representative.

**Important**

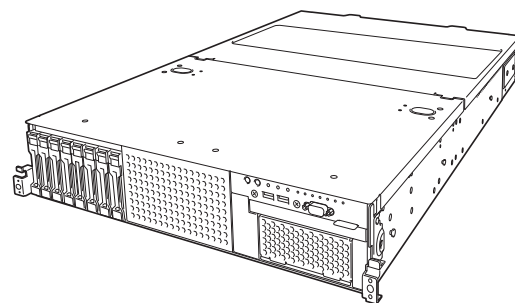
The chassis serial number plate and maintenance label is located on the server. If the serial number does not match the number on the warranty, you may not be guaranteed against failure even within the warranty period. Contact your sales representative if they do not match.

## 3. Features

The server has the following features:

### High performance

- Intel Xeon processor
  - N8101-1068F: Intel Xeon processor E5-2603v4 (1.70GHz 6Core)
  - N8101-1069F: Intel Xeon processor E5-2609v4 (1.70GHz 8Core)
  - N8101-1070F: Intel Xeon processor E5-2620v4 (2.10GHz 8Core)
  - N8101-1071F: Intel Xeon processor E5-2623v4 (2.60GHz 4Core)
  - N8101-1072F: Intel Xeon processor E5-2630v4 (2.20GHz 10Core)
  - N8101-1073F: Intel Xeon processor E5-2650v4 (2.20GHz 12Core)
  - N8101-1074F: Intel Xeon processor E5-2660v4 (2.00GHz 14Core)
  - N8101-1075F: Intel Xeon processor E5-2690v4 (2.60GHz 14Core)
- Turbo Boost Technology feature \*1
- Hyper Threading Technology feature \*1
- High-speed memory access (DDR4 1600/1866/2133/2400 supported) \*2
- High-speed disk access (SATA 6Gbps, 6Gbps, and SAS 12Gbps supported))
- High-speed 1000BASE-T/100BASE-TX/10BASE-T (2 ports) interface (1Gbps/100Mbps/10Mbps supported)



### High reliability

- Processor throttle-ring feature
- Memory monitoring feature (error correction/error detection)
- Memory degeneracy feature (logical isolation of a failed device)
- Memory x4 SDDC feature
- Memory mirroring, memory LockStep (x8 SDDC), memory sparing features
- Memory throttle-ring feature
- Bus parity error detection
- Temperature detection
- Error detection
- Internal fan monitoring feature
- Internal voltage monitoring feature
- Power redundant feature (hot swapping supported)
- RAID system (Disk Array) (An option card is required.)
- Auto rebuild feature (hot swapping supported)
- BIOS password feature
- The security lock that comes with Front Bezel
- Redundant fan configuration
- Fan (hot swapping supported)
- HDD (hot swapping supported)



**Management Utilities**

- NEC ESMPRO
- ExpressUpdate
- Remote controlling feature (EXPRESSSCOPE Engine 3)
- RAID system management utility (Universal RAID Utility)
- 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® Titanium certified high efficiency power supply \*3
- Fan control appropriate to environment, work load, and configuration
- Silent sound design
- Enhanced Intel SpeedStep® Technology supported
- Cold redundant feature

**Expandability**

- PCI Express 3.0 (x16 lanes): 2 slot
- PCI Express 3.0 (x8 lanes): 2 slots \*4
- PCI Express 2.0 (x4 lanes): 1 slot (x8 socket)
- Large capacity memory of up to 512 GB \*5
- Can upgrade to multi-processor system with up to two processors
- Expansion Bay (for hard disk drives):
  - 16x 2.5-inch Drive Model: 2.5-inch drive bay 16 slots \*6
  - 26x 2.5-inch Drive Model: 2.5-inch drive bay 26 slots \*7
  - 3.5-inch Drive Model: 3.5-inch drive bay 12 slots , 2.5-inch drive bay: 2 slots \*8
- Optical disk drive bay provided as standard \*9
- Expansion Bay (for backup unit) provided as standard \*9
- USB3.0 interface (Front: 2 ports, rear: 2 ports, internal: 1 port)
- USB2.0 interface (Rear: 2 ports, internal: 1 port)
- Two LAN ports
- Management LAN port (1 port)

**Ready to use**

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

**Many built-in Features**

- Redundant power supply system supported (valid when optional power supply unit is installed)
- El Torito Bootable CD-ROM (no emulation mode) format supported
- Software power-off
- Remote power-on feature
- AC-Link feature
- Remote console feature
- Power switch mask
- Connector for display unit provided on front panel\*9
- Baseboard Management Controller (BMC) conforming to IPMI v2.0
- Secure boot supported

**Self-diagnosis**

- Power On Self-Test (POST)
- Test and Diagnosis (T&D) utility

**Easy setup**

- EXPRESSBUILDER (setup utility)
- BIOS Setup utility (SETUP)

**Maintenance features**

- Off-line Tools
- Memory dump feature using DUMP Switch
- Feature to backup and restore BIOS/BMC settings using EXPRESSSCOPE Profile Key

\*1: Unsupported on Xeon processor E5-2603 v4, E5-2609 v4 embedded models.

\*2: Processor core speed depends on processor type, number and type of DIMMs installed.

\*3: Requires N8181-118F power unit. Power supply unit N8181-121F/122F/123F is compliant to 80 Plus Platinum.

\*4: In 2-CPU configuration. One slot in 1-CPU configuration.

\*5: In 2-CPU configuration. Up to 256 GB in 1-CPU configuration.

\*6: When an N8154-74 2.5-inch HDD cage is installed. A 2.5-inch drive bay with 8 slots is provided in standard configuration.

\*7: When an N8154-75 2.5-inch HDD cage and an N8154-76 2.5-inch HDD cage (rear) are installed. A 2.5-inch drive bay with 16 slots is provided in standard configuration.

\*8: When an N8154-76 2.5-inch HDD cage (rear) is installed. A 3.5-inch drive bay with 12 slots is provided in standard configuration.

\*9: Provided only for 16x 2.5-inch drive model.

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## ***3.1* Firmware and Software Version Management**

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Use of NEC ESMPRO Manager, ExpressUpdate Agent, and EXPRESSSCOPE Engine 3 allows you to manage versions of firmware and software as well as update them by applying update packages.

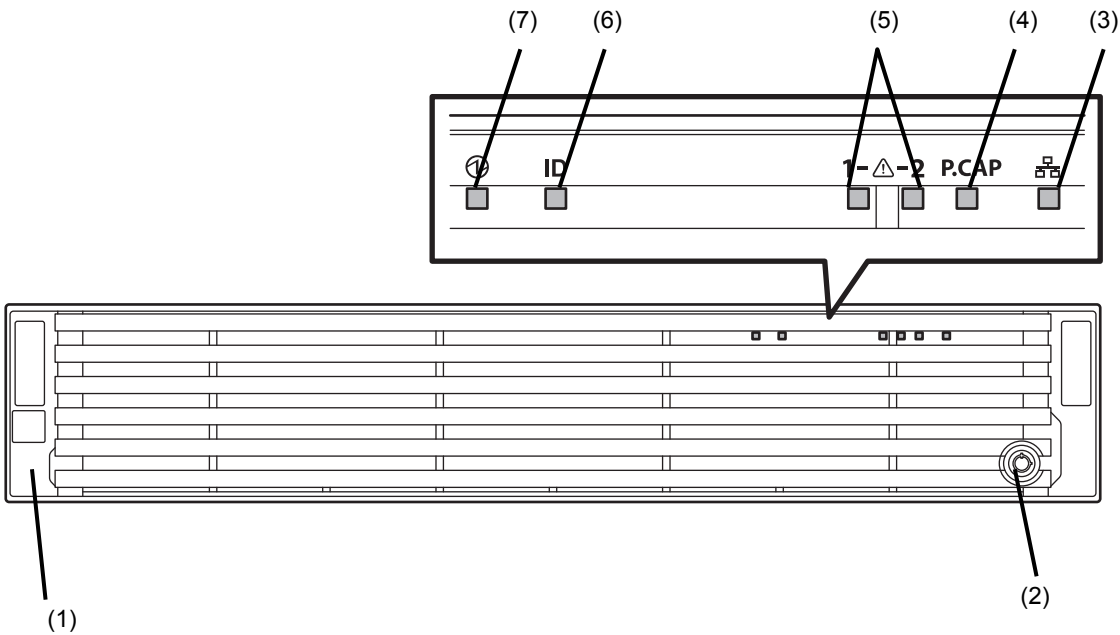
This feature automatically updates modules without stopping the system just by specifying the updating packages from NEC ESMPRO Manager.

# 4. Names and Functions of Parts

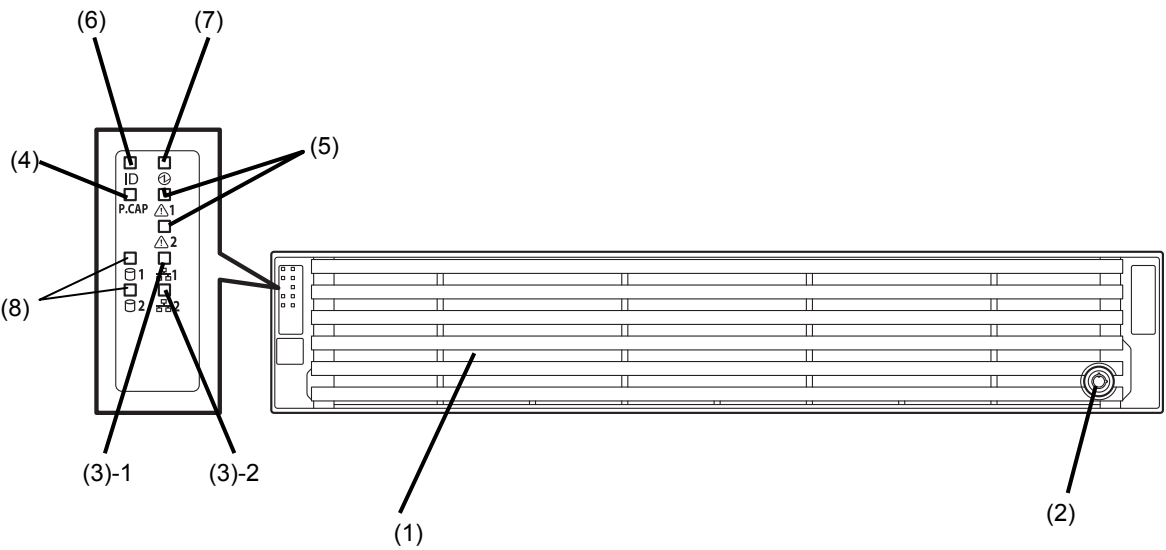
This section describes the names of the server parts.

## 4.1 Front View (With Front Bezel)

### 16x 2.5-inch Drive Model



### 26x 2.5-inch Drive Model / 3.5-inch Drive Model



**(1) Front Bezel**

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

**(2) Key Slot**

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

**(3) LINK/ACT LED**

LEDs for showing the status of accessing to the network.

(See page 35)

(3)-1: LAN1 connector

(3)-2: LAN2 connector

**(4) Power Capping LED**

An LED for showing the power capping status of the server.

**(5) STATUS LED 1, 2**

An LED for showing the server status.

(See page 33)

**(6) Unit ID (UID) LED**

An LED for maintaining the server. This LED turns on when UID Switch is pressed. Commands from the software also cause it to turn on or flash.

(See page 35)

**(7) POWER LED**

An LED for showing the power status of server.

(See page 33)

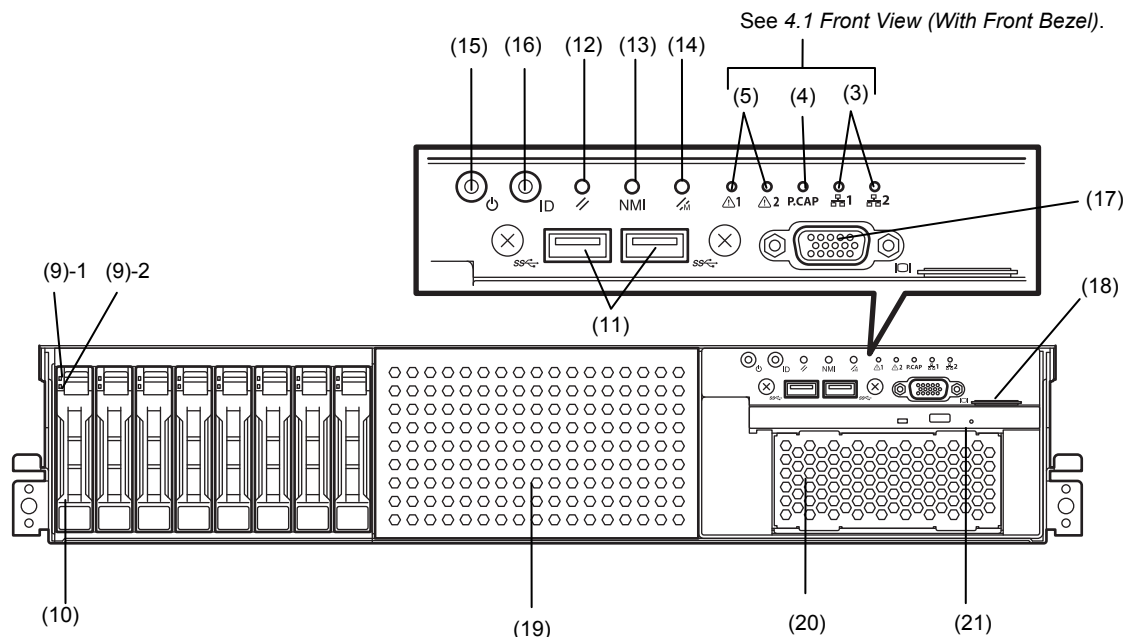
**(8) Global HDD LED**

LEDs for showing the hard disk drive status.

(See page 39)

## 4.2 Front View (Without Front Bezel)

### 16x 2.5-inch Drive Model



#### (9) DISK LED

LEDs for showing the hard disk drive status.  
The LED provided for each HDD.  
(See page 36)

#### (10) 2.5-inch Hard Disk Drive Bay

Bays for installing HDDs.

#### (11) USB Connectors (front)

Connectors for connecting USB interface devices.

#### (12) RESET Switch

A switch for resetting the server.

#### (13) DUMP Switch (NMI)

A switch for collecting the memory dump.

#### (14) BMC RESET Switch

A switch for resetting BMC of this server. Use the switch only when there is a problem with EXPRESSSCOPE Engine 3 (BMC).

To use this switch, press it at least five seconds.

#### (15) POWER Switch/LED

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

(See page 33)

#### (16) Unit ID (UID) Switch/LED

A switch for turning on/off UID LED.

Pressing the switch once turns on UID LED and pressing again turns off the LED.

Commands from the software also cause it to turn on or flash.

(See page 35)

#### (17) Display Connector \*1

A connector for connecting a display. This connector cannot be used with the display connector on rear panel at the same time.

#### (18) Pull-out Tab

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

#### (19) 2.5-inch Additional HDD Cage Bay

A bay for installing 2.5-inch Additional HDD cage.

#### (20) Expansion Bay (for file backup unit)

A bay for installing an optional RDX drive.

#### (21) Optical Disk Drive Bay

A bay for installing an optical disk drive.

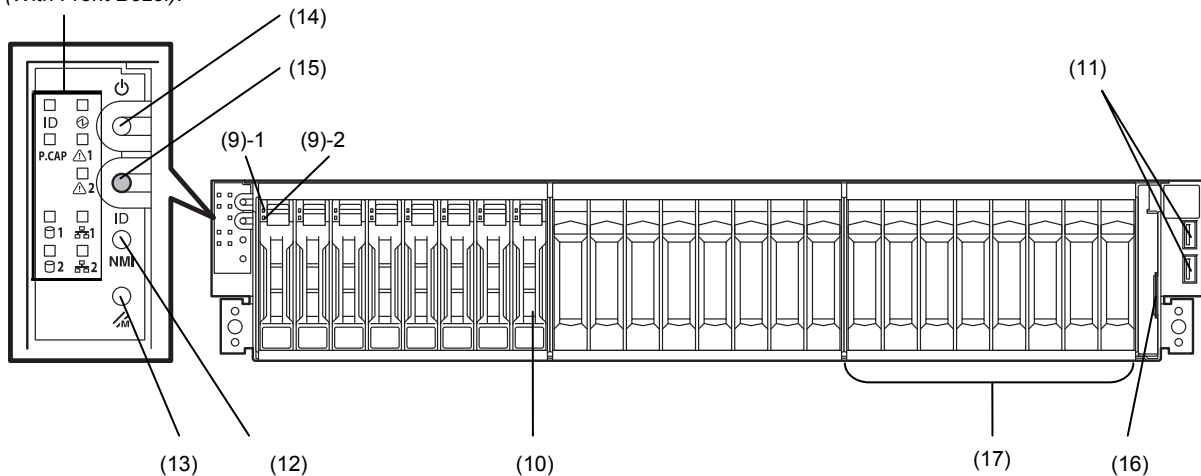
Either of the following drive can be installed.

- DVD-ROM drive
- DVD SuperMULTI drive

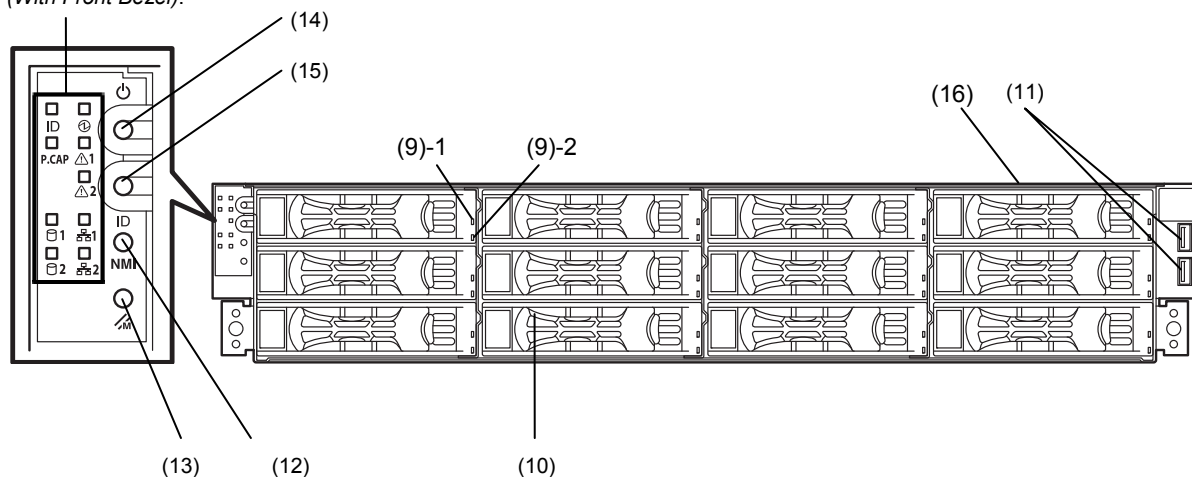
\*1 The tray of optical disk drive cannot open depending on the connector of display cable. In this case, disconnect the display cable and then open/close the tray.

**26x 2.5-inch Drive Model**

See 4.1 Front View  
(With Front Bezel).

**12x 3.5-inch Drive Model**

See 4.1 Front View  
(With Front Bezel).

**(9) DISK LED**

LEDs for showing the hard disk drive status.  
The LED provided for each HDD.  
(See page 36)

**(10) 2.5-inch / 3.5-inch Hard Disk Drive Bay**

Bays for installing HDDs.

**(11) USB Connectors (front)**

Connectors for connecting USB interface devices.

**(12) DUMP Switch (NMI)**

A switch for collecting the memory dump.

**(13) BMC RESET Switch**

A switch for resetting BMC of this server. Use the switch only when there is a problem with EXPRESSSCOPE Engine 3 (BMC).

To use this switch, press it at least five seconds.

**(14) POWER Switch**

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

**(15) Unit ID (UID) Switch**

A switch for turning on/off UID LED.  
Pressing the switch once turns on UID LED and pressing again turns off the LED.

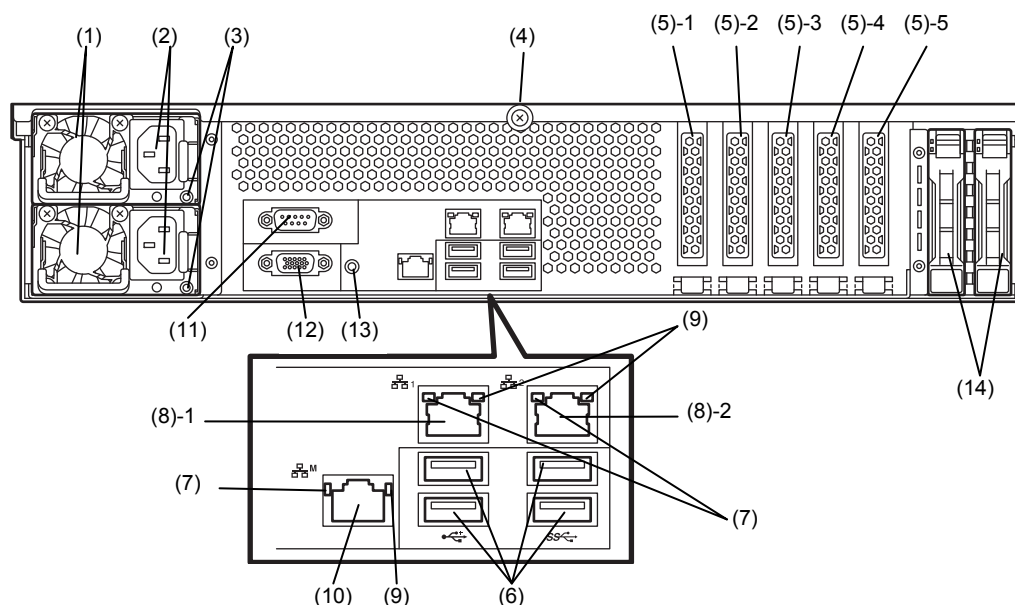
**(16) Pull-out Tab**

A tab for showing the part number and serial number of the server.

**(17) 2.5-inch Additional HDD Cage Bay**

A bay for installing 2.5-inch Additional HDD cage.

## 4.3 Rear View



### (1) Power Unit

A power supply for supplying the DC power to the server.

### (2) AC Inlet

A socket for connecting the power cord.

### (3) AC POWER LED

An LED for showing the power supply status.  
(See page 38)

### (4) Cap Screw

A screw for fixing the top cover.

### (5) Slot for PCI Card

Slots for installing PCI cards.  
"1", "2", "3", "4", and "5" indicate PCI slot number.

### (6) USB Connectors

Connectors for connecting USB interface devices.

### (7) LINK/ACT LED

LEDs for showing the access status of LAN.  
(See page 37)

### (8) LAN Connectors

LAN connectors which supports  
1000BASE-T/100BASE-TX/10BASE-T.

(10)-1: LAN1 port connector

(10)-2: LAN2 port connector

If Shared BMC LAN feature is enabled in ROM Utility, LAN connector 1 can also be used as the management LAN port. Sharing port is not recommended from the point of performance and security.

### (9) SPEED LED

LEDs for showing the transfer speed of LAN ports.  
(See page 37)

### (10) Management LAN Connector

A LAN connector which supports  
1000BASE-T/100BASE-TX/10BASE-T. This port  
cannot be used as a data transmission port.  
This port is used for connecting to EXPRESSSCOPE  
Engine 3.

### (11) Serial Port A (COM) Connector

A connector for connecting serial interface devices.  
This cannot connect to a network line directly.

### (12) Display Connector

A connector for connecting a display.  
This connector cannot be used with the display  
connector on front panel at the same time.

### (13) UID Switch/LED

A switch for turning on/off UID LED.  
Pressing the switch once turns on UID LED and  
pressing again turns off the LED.  
Commands from the software also cause it to turn on  
or flash.  
(See page 35)

### (14) 2.5-inch Additional HDD Cage Bay

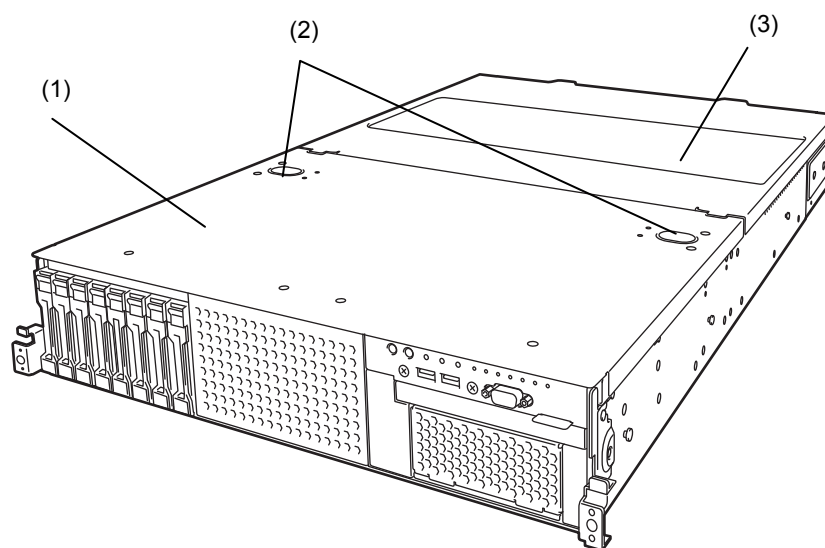
A bay for installing 2.5-inch Additional HDD cage  
(Rear). Not available in 16x 2.5-inch drive models.



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## 4.4 External View

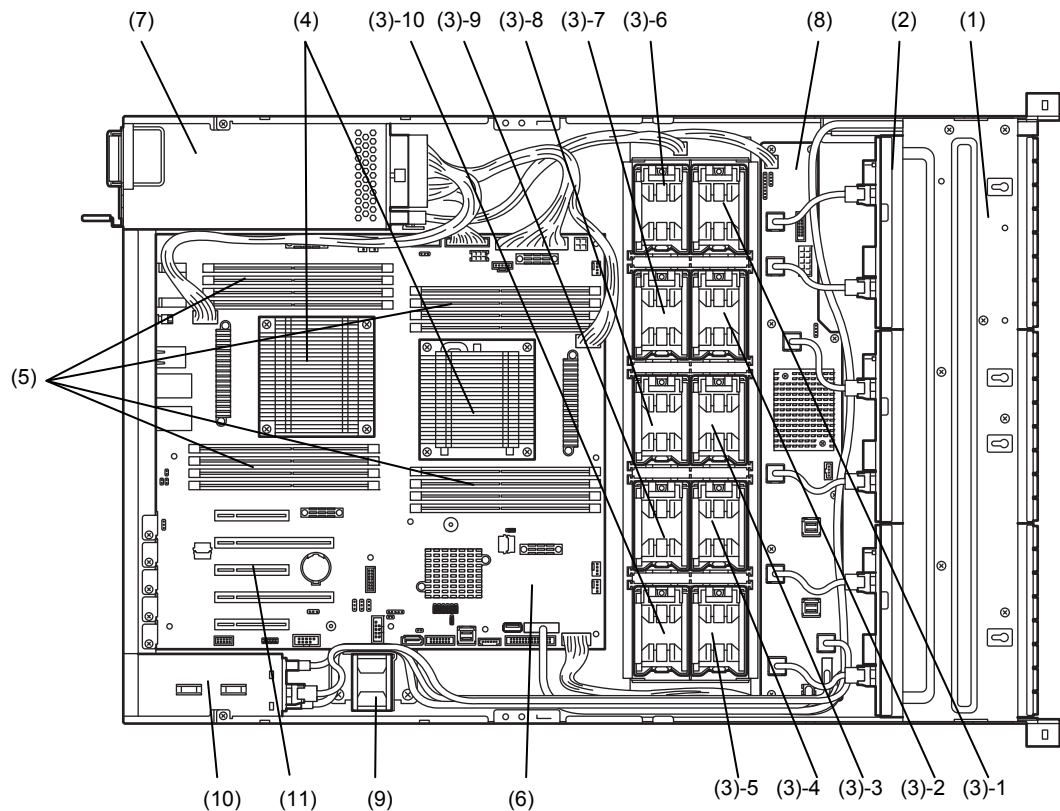
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- (1) Top Cover (front)
- (2) Release Button
- (3) Top Cover (rear)

4.5    Internal View

The duct and support bar are not shown in the figure below.



- (1)    **Protective Cover**

(2)    **Backplane**

(3)    **Cooling Fan**

-1    FAN5F (optional)

-2    FAN4F (optional)

-3    FAN3F (optional)

-4    FAN2F (optional)

-5    FAN1F (optional)

-6    FAN5R

-7    FAN4R

-8    FAN3R

-9    FAN2R

-10    FAN1R
- (4)    **Processor (CPU)**

Mounted beneath the heat sink.

(5)    **DIMM (optional)**

(6)    **Motherboard**

(7)    **Power Supply Unit**

(8)    **Expander Card**

(9)    **Rear Cooling Fan**

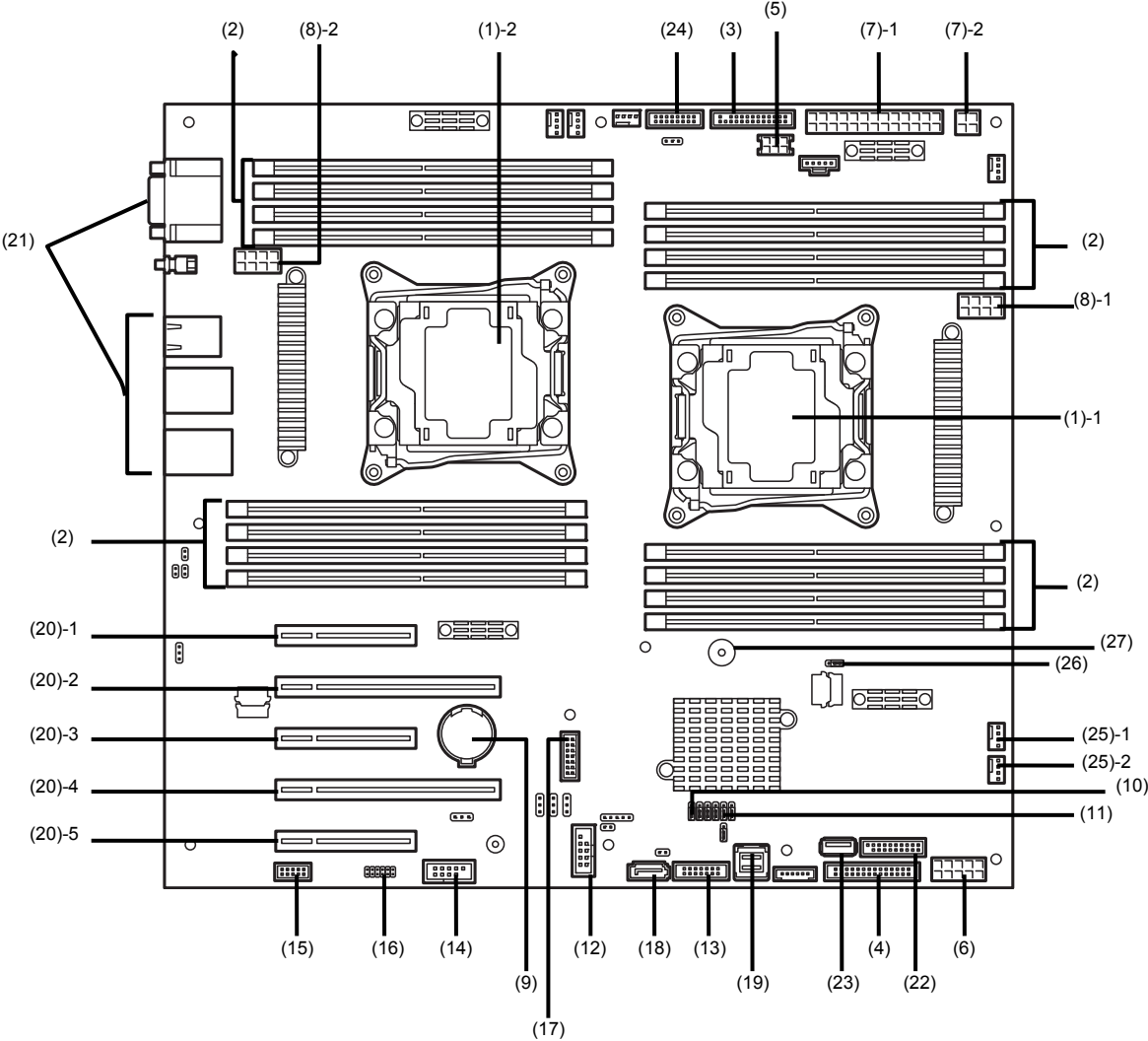
(10)    **2.5-inch Additional Rear HDD Cage**

(11)    **PCI Slots**

16x 2.5-inch drive models:  
FAN2R to FAN5R are factory installed. FAN2F to FAN5F\* are used when optional redundant fan unit is installed.

26x 2.5/3.5-inch drive models:  
FAN1R to FAN5R are factory installed. FAN1F to FAN5F\* are used when optional redundant fan unit is installed.

4.6 Motherboard



**(1) Processor (CPU) Socket**

- 1 Processor #1 (CPU#1)
- 2 Processor #2 (CPU#2)

**(2) DIMM Socket****(3) Front Panel Connector****(4) Fan Board Connector****(5) Connector for SATA Optical Disk/Backup Unit Power Supply****(6) Connector for HDD Cage Power Supply****(7) Connector for MB Power Supply****(8) Connector for CPU Power Supply****(9) Lithium Battery****(10) Clear CMOS Jumper****(11) Clear Password Jumper****(12) USB Memory Module Connector****(13) SGPIO Cable Connector****(14) Connector for Optional COM**

Connect an additional RS-232C connector kit N8117-01A to use this port as a serial port B.

**(15) SPI Flash Mezzanine Connector**

EXPRESSSCOPE Profile Key (SPI Flash memory) has been installed, where BIOS and BMC configuration data is stored. Relocate it when replacing motherboard to inherit configuration data.

**(16) Front Display Connector****(17) TPM kit Connector****(18) SATA Optical Disk Drive Connector****(19) SATA Connector****(20) PCI Connector**

The last digit number indicates PCI card slot number. For available card, see *Chapter 2 (1.15 PCI Card)*.

**(21) Connector for External Devices**

(See page 31.)

**(22) Front USB Connector****(23) Connector for USB Backup Unit****(24) Connector for Power Supply BP Signal****(25) Connector for Rear Cooling Fan**

-1 For FAN6R (lower fan)

-2 For FAN7R (upper fan)

**(26) RAID Configuration Jumper****(27) Buzzer**

## 4.7 Status Indicators

### 4.7.1 POWER LED ( )

POWER LED indicates power ON/OFF status of the server.

POWER LED pattern	Description
On (green)	The server is normally powered on.
Off	The server is off-powered. The server is in halt status.

### 4.7.2 STATUS LED 1, 2 ( )

While hardware is operating normally, STATUS LED 1 lights green. STATUS LED 2 is off.

STATUS LED 1 is off or STATUS LED 2 lights/flashes amber if there is a hardware failure.

#### Tips

If NEC ESMPRO is installed, you can view error logs to check the causes of failures.

STATUS LED 1, 2 pattern		Description	Solution
STATUS LED 1	STATUS LED 2		
On (green)	Off	The server is operating normally.	—
On (green)	On (amber)	Initialization of BMC is in progress.	Wait until initialization completes.
Flashing (green)	Off	Memory is in a degraded state	Identify the device in degraded state by using BIOS Setup Utility (SETUP), and replace it as soon as possible.
		Operating while CPU error is detected.	
		In redundant power configuration, power is not supplied to either of power unit.	
Off	Off	The power is off.	Turn on the server.
		POST is in progress.	Wait for a while. STATUS LED will turn green after POST completes.
		Watchdog timer expired.	Turn the power off and then turn it on. If POST screen displays any error message, take notes of the message, and contact your sales representative.
		Memory dump is being requested. Note: It remains green if the dump is caused by software.	Wait until the memory dump is completed.

STATUS LED 1, 2 pattern		Description	Solution
STATUS LED 1	STATUS LED 2		
Off	On (amber)	A temperature alarm was detected.	Check the internal fan for dusts. Also check if the fan unit is properly connected. If the LED indication does not change, contact your sales representative.
		A CPU error occurred.	Turn the power off and then turn it on.
		Abnormal CPU temperature is detected.	If POST displays any error message, take notes of the message, and contact your sales representative.
		A PCI system error occurred	
		A PCI parity error occurred	
		A PCI bus error occurred.	Contact your sales representative.
		A voltage alarm was detected.	
		Fan error was detected.	
		Sensor error was detected.	
		A CPU temperature alarm was detected.	
		An error occurred on Intel Node Manager (one of the features of EXPRESSSCOPE Engine 3).	
Off	Flashing (amber)	Power Supply Unit is failing (in power redundant configuration).	Contact your sales representative.
		A fan alarm was detected.	Check if the internal fan cable is properly connected. If the LED indication does not change, contact your sales representative.
		A temperature warning was detected.	Check the internal fan for dusts. Also check if the fan unit is properly connected. If the LED indication does not change, contact your sales representative.
		A voltage warning was detected	Contact your sales representative.
		One or more hard disk drives are failing (excluding RAID0 or non-RAID configuration).	
		A correctable memory error has often occurred.	Replace the failure DIMM.

### 4.7.3 LINK/ACT LED (□□1, □□2, □□M)

LINK/ACT LED on front panel indicates the status of LAN port.

LINK/ACT LED pattern	Description
On (green)	The server is connected with network normally.
Flashing (green)	The server is accessing network.
Off	The server is disconnected from network.

### 4.7.4 Optical Disk Drive Access LED (option)

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

### 4.7.5 UID LED (ID)

UID LED is provided one each at the front and rear of the server. If you press UID Switch provided at the front or rear of the server, the light turns on. If you press it again, the light turns off. It flashes when commands from software are received. This LED is used to identify the target server among multiple servers installed in a rack. Especially when performing maintenance from behind the server, lighting the LED will help you to identify which server to work with.

UID LED pattern	Description
On (blue)	The UID switch is pressed.
Off	The UID switch is not pressed.

### 4.7.6 Power Capping LED

Power Capping LED indicates the status of Power Capping feature as shown below.

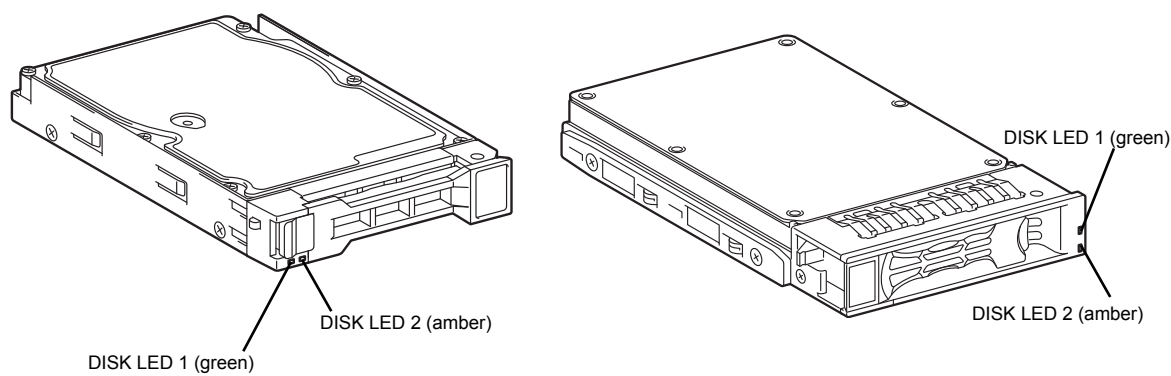
Power Capping LED pattern	Description
On (green)	Power Capping feature is enabled.
Flashing (green)	Power Capping is enabled and power control (capping) is working.
Off	Power Capping feature is disabled.

#### Note

The Power Capping LED seems to be lit or flashing amber when STATUS LED is lit or flashing amber. The amber STATUS LED indicates a hardware failure. Contact your sales representative.

4.7.7    LED on a hard disk drive

Each HDD is equipped with DISK LED.



DISK1, 2 LED pattern		Description	Solution
DISK LED 1	DISK LED 2		
Flashing (green)	Off	Hard disk drive is being accessed.	—
Off	On (amber) (only when RAID system is configured)	Hard disk drive is failing.	Contact your sales representative.
Flashing (green)	Flashing (amber) (only when RAID system is configured)	Rebuild is in progress. When the failed hard disk drive is replaced, rebuild process starts automatically (auto rebuild feature).	—
Off	Off	Hard disk drive is halted.	—

Important

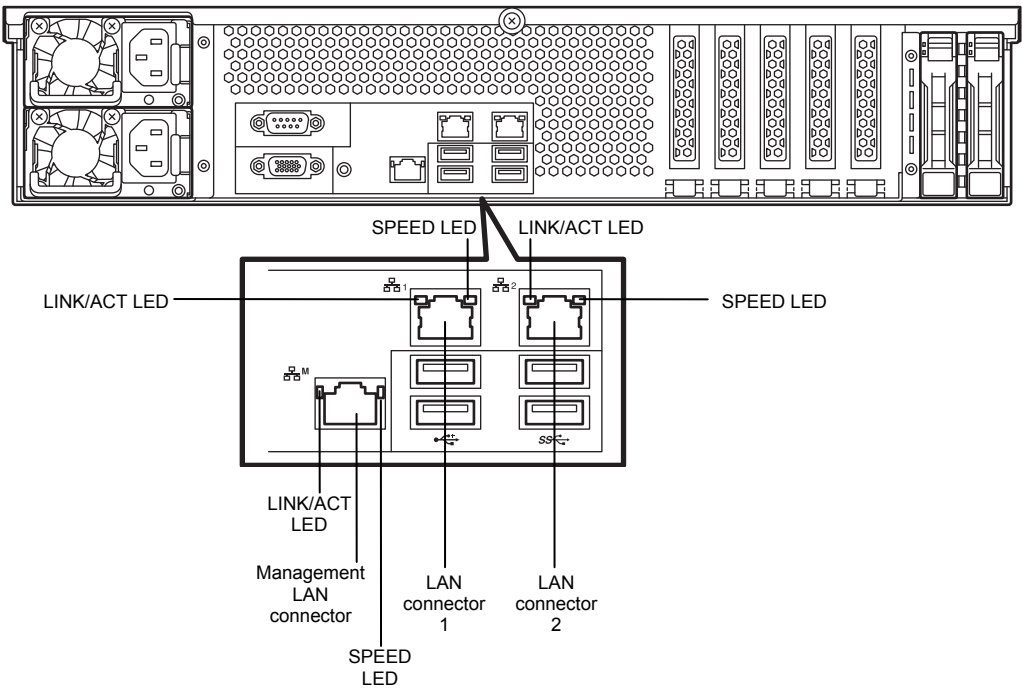
Observe the following precautions whenever you use the auto rebuild feature.

- Do not turn off or reboot the server while a HDD is being rebuilt.
- Wait at least 90 seconds before installing a HDD after removing one.
- Do not replace a HDD while another HDD is being rebuilt.



4.7.8    LEDs for LAN connectors

The LAN connectors on rear panel have LINK/ACT LED and SPEED LED.



• **LINK/ACT LED** (□□1, □□2, □□M)

This LED indicates the status of the LAN port.

LINK/ACT LED pattern	Description
On (green)	The server is connected with network normally.
Flashing (green)	The server is accessing network.
Off	The server is disconnected from network.

• **SPEED LED** (○□1, ○□2, ○□M)

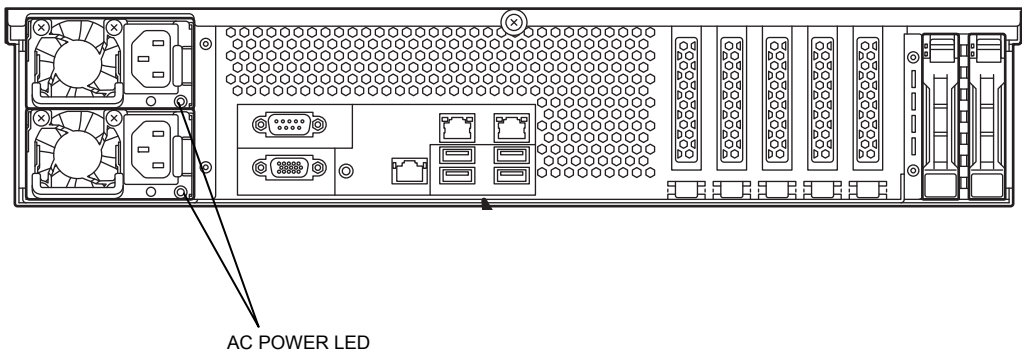
This LED indicates which network interface is used.

- The standard LAN ports (□□1 and □□2) support 1000BASE-T, 100BASE-TX, and 10BASE-T.
- The management LAN port (□□M) supports 1000BASE-T, 100BASE-TX, and 10BASE-T.

SPEED LED pattern	Description
On (amber)	The port is operating with 1000BASE-T interface.
On (green)	The port is operating with 100BASE-TX interface.
Off	The port is operating with 10BASE-T interface.

4.7.9    **AC POWER LED on Power Unit**

The power unit is equipped with AC POWER LED.



The following table lists LINK/ACT LED patterns.

AC POWER LED pattern	Description	Solution
On (green)	The server is powered on.	—
Flashing (green)	The power cable is connected and AC power is supplied.	—
	Cold Redundant feature is enabled.	—
On (amber)	The power cable is not connected in redundant power configuration.	Connect the power cable.
	Power unit is failing.	Contact your sales representative.
Flashing (amber)	Power unit is failing.	Contact your sales representative.
Off	The power is not supplied to the server.	Connect the power cable. If it is already connected, contact your sales representative.

#### 4.7.10 Global HDD LED1,2(1--2)

Global HDD LED indicates the status of internal hard disk drives.

Status of Global HDD LED 1 and 2		Description	Action
Global HDD LED1	Global HDD LED2		
Blinking (green)	Off	Hard disk drive is being accessed.	—
Off	On (amber) (only when RAID system is configured)	Hard disk drive is failing.	Contact your sales representative.
Blinking (green)	Blinking (amber) (only when RAID system is configured)	Rebuild is in progress. When the failed hard disk drive is replaced, rebuild process starts automatically (auto rebuild feature).	—
Off	Off	Hard disk drive is halted.	—

**Important** Observe the following precautions whenever you use the auto rebuild feature.

- Do not turn off or reboot the server while a HDD is being rebuilt.
- Wait at least 90 seconds before installing a HDD after removing one.
- Do not replace a HDD while another HDD is being rebuilt.

## NEC Express5800 Series Express5800/R120g-2E

# 2

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# Preparations

This chapter describes preparations for using this server.

### 1. Installing Internal Optional Devices

Describes how to install or remove optional devices.

You can skip this section if you do not add any optional devices.

### 2. Installation and Connection

Describes how to place the server and connect the cables.

# 1. Installing Internal Optional Devices


This section describes the instructions for installing supported optional devices and precautions. If you did not purchase any optional devices, you can skip this section.









## Important

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

## 1.1 Safety Precautions


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






 **WARNING**

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, 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

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## 1.2 Anti-static Measures

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The server contains static-sensitive components. Follow the measures below to avoid a failure caused by static electricity when installing or uninstalling any optional device.

- **Wearing Anti-static Wrist Strap or Anti-static Gloves**

Wear a wrist strap on your wrist and connect the wire to the chassis. If there is no wrist strap, touch an unpainted metal surface of the chassis connected to the ground to discharge static electricity from your body before touching the component. Touch the metal part occasionally to discharge the static electricity while working on the component.

- **Checking the Workplace**

- Work on an anti-static floor or concrete floor.
- If you work on a place where static electricity is likely to be generated (such as carpet), be sure to provide anti-static protection.

- **Using the Work Table**

Place the server on a mat with Electrostatic Discharge (ESD) protection.

- **Clothing**

- Do not wear wool or synthetic clothes.
- Wear anti-static shoes.
- Remove a ring, bracelet, wrist watch, and any kind of metal accessories.

- **Handling of Components**

- Keep the component in an anti-static bag until you install it to the server.
- Hold the component by the edges to avoid touching any terminals or mounting parts.
- Place the component in an anti-static bag when storing or moving them.

- **Handling of Cables**

When connecting a cable (a long LAN cable), static electricity may also be charged due to friction against the floor. Connecting the charged cable to the server will cause damage to the internal devices of the server. It is recommended to use a product such as electrostatic discharge kit to eliminate the static charge before connecting the cable.

- **Installing and Uninstalling the Optional Device**


- To avoid electric hazard and malfunction, be sure to turn off the power switch of the server and unplug the power cord from the outlet before installing or uninstalling any optional device.
- If the device is a hot-plug device, you do not need to turn off the power switch and unplug the power cord.
- The device contains static-sensitive electronic components. When installing or uninstalling the optional device, wear an anti-static wrist strap on your wrist to avoid a failure caused by the static electricity. To use the strap, connect the wire to the chassis.

## 1.3 Overview of Installation and Removal

Install/remove components by using the following procedure.

Installing/removing internal components except for hard disk drives, fan unit, and power supply unit should be done after dismounting the server from the rack.

**⚠ 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. If the server is mounted on a rack, use the UID switch to identify the target server.  
See *Chapter 2 (1.4 Confirming Servers (UID Switch))*.
2. Remove Front Bezel.  
See *Chapter 2 (1.5 Removing Front Bezel)*.
3. If the server is ON, turn it off.  
See *Chapter 3 (6. Turning Off the Server)*.
4. 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 continuing to work because the components such as cooling fan on the motherboard might still be operating for about 30 seconds even after the power cord was disconnected.
- Make sure the AC POWER LED on power supply unit is unlit.

5. If you want to install hard disk drives only, go to step 14. If not, pull out the server from the rack and put it on a flat rigid desk. See *Chapter 2 (2.1 Installation)* for details.

**Important**

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

6. Remove Top Cover.  
See *Chapter 2 (1.6 Removing Top Cover)*.
7. Remove Support Bar.  
See *Chapter 2 (1.7 Removing Support Bar)*.
8. Remove Air Duct.  
See *Chapter 2 (1.8 Removing Support Bar/Air Duct)*.

9. Depending on the components to be installed or removed, follow the procedure in order.  
See *Chapter 2 (1.9 TPM Kit to 1.20 Use of Internal Hard Disk Drives in the RAID System)*.
10. Mount Air Duct.  
See *Chapter 2 (1.22 Air Duct)*.
11. Mount Support Bar.  
See *Chapter 2 (1.22 Installing Support Bar)*.
12. Attach Top Cover.  
See *Chapter 2 (1.23 Installing Top Cover)*.
13. Mount the server onto the rack.  
See *Chapter 2 (2.1.2 (1) Installation)*.
14. Install hard disk drives.  
See *Chapter 2 (1.24 2.5-inch Hard Disk Drive or 1.25 3.5-inch Hard Disk Drive)*.
15. Install power supply units.  
See *Chapter 2 (1.26 Power Supply Unit)*.
16. Attach Front Bezel.  
See *Chapter 2 (1.27 Installing Front Bezel)*.

This is the end of the installation or removal procedures for internal optional devices.

Continue the setup with reference to *Chapter 2 (2.2 Connection)*.



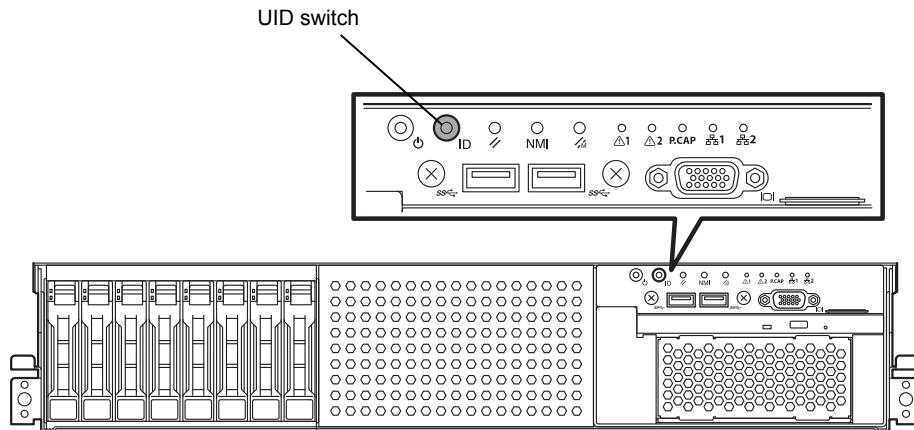
## 1.4 Confirming Servers (UID Switch)

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

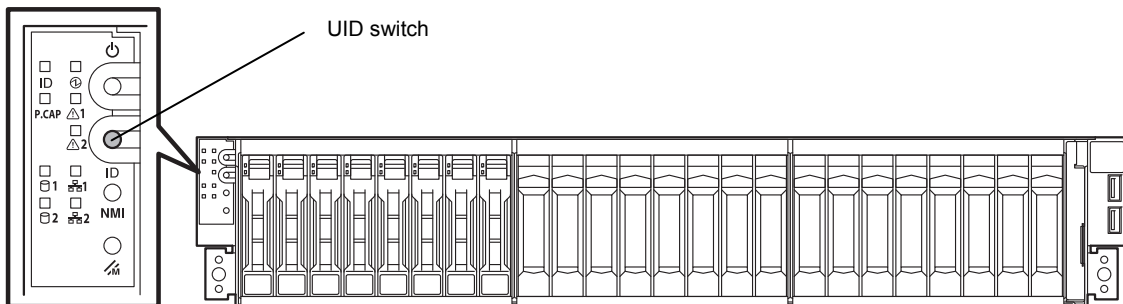
When the server is working, before you turn the server off or disconnect a cable from the server, **be sure to identify the target server by using UID Switch/LED first.**

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

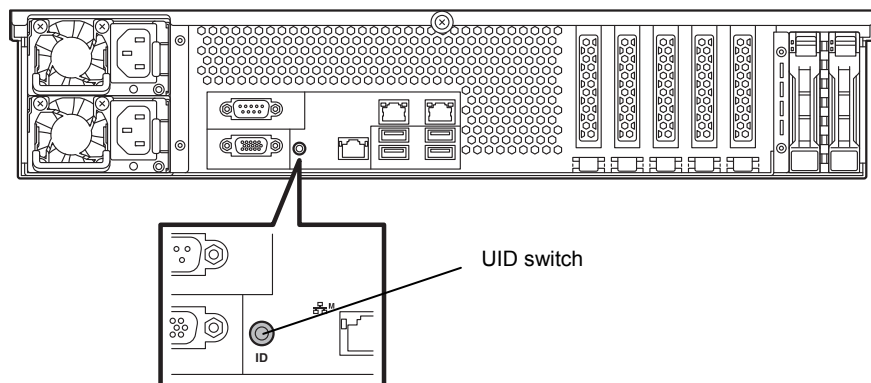
### <Front View> 16x 2.5-inch Drive Model



### <Front View> 26x 2.5-inch Drive Model / 3.5-inch Drive Model



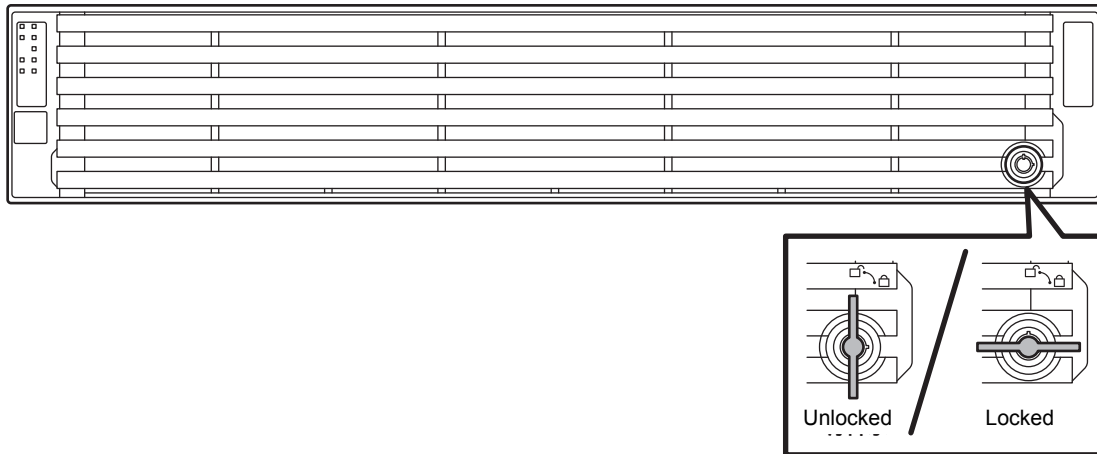
### <Rear View>



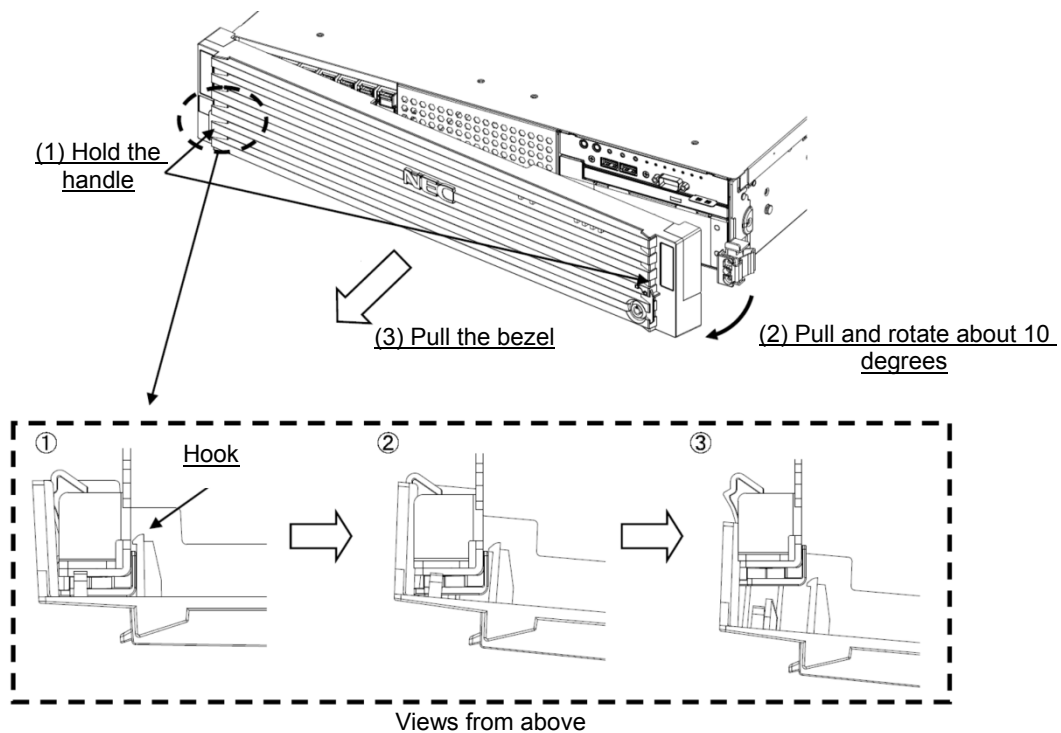
## 1.5 Removing Front Bezel

Remove Front Bezel when pressing POWER Switch or removing Top Cover.

1. Insert the attached Bezel Lock Key into the key slot and turn the key to the front bezel side while pressing it lightly to release the lock.



2. Hold the left end of front bezel and pull the right end toward you about 10 cm. Check that the hook in left is removed as illustrated in the figure below and remove the left end from the chassis.
3. Confirm that the left side of front bezel is unlocked, then hold the left end and pull it toward you to remove the front bezel from chassis.



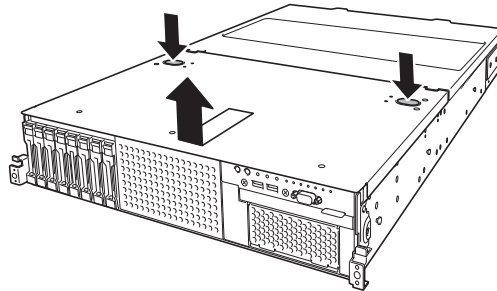
**Note** Be careful not to press POWER Switch.

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

## 1.6 Removing Top Cover

Remove Top Cover when installing or removing the optional component or change internal cable connection.

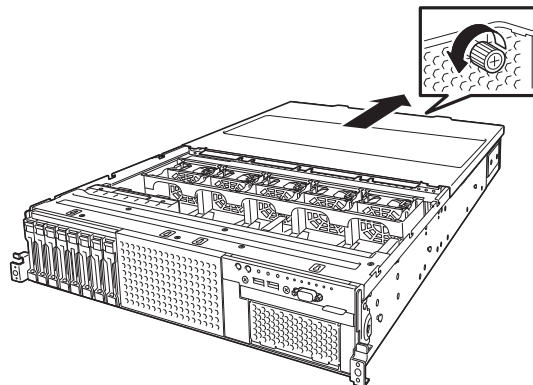
1. See steps 1 to 5 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Slide Top Cover (front) toward the front of the server while pressing Release Button on the cover.
3. Lift Top Cover (front), and remove it from the server.



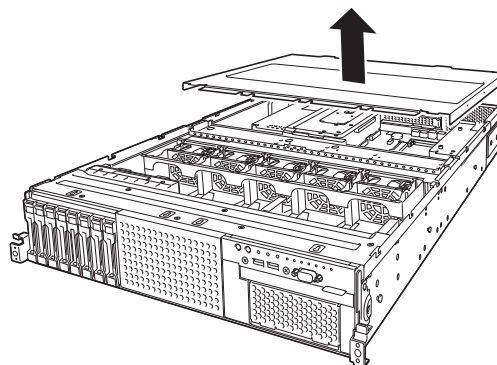
### Tips

The screw hole on the place where front and rear top covers overlap each other, is not used.

4. Loosen Cap Screw of Top Cover (rear), and slide the top cover (rear) toward the rear of the server.



5. Lift Top Cover (rear) and remove it from the server.



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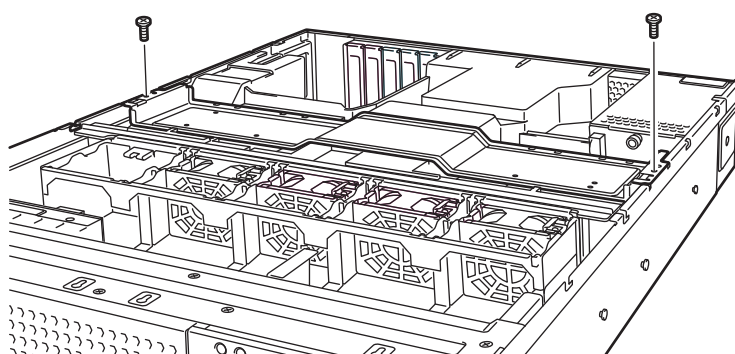
## 1.7 Removing Support Bar

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Remove Support Bar when installing or removing the following component:

TPM Kit	Processor (CPU)
DIMM (memory module)	Flash backup unit for RAID controller
Backup device	PCI card
Additional 2.5-inch HDD Cage	Additional 2.5-inch HDD Cage (Rear)
2.5-inch PCIe SSD installation kit	

1. See steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the two screws from Support Bar.



3. Lift Support Bar, and remove it from the server.

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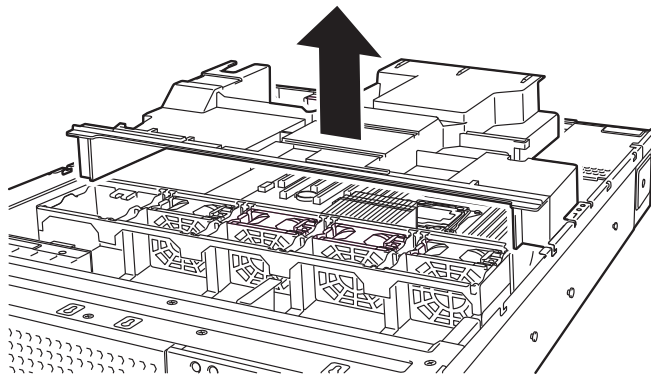
## 1.8 Removing Air Duct

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Remove the air duct when installing or removing the following component or changing internal cable connection:

TPM Kit	Processor (CPU)
DIMM (memory module)	Flash backup unit for RAID controller
Backup device	PCI card
Additional 2.5-inch HDD Cage	Additional 2.5-inch HDD Cage (Rear)
2.5-inch PCIe SSD installation kit	

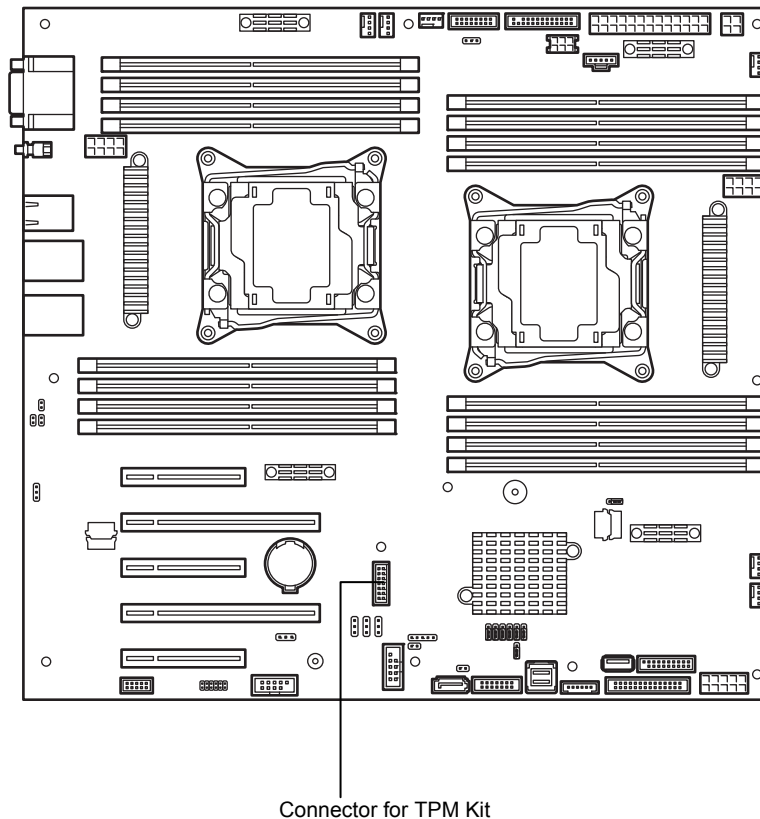
1. See steps 1 to 8 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Lift the air duct, and remove it from the server.



**Important** Before removing the air duct, put cables aside. Otherwise, cables may be damaged if they are pulled together with air duct.

## 1.9 TPM Kit

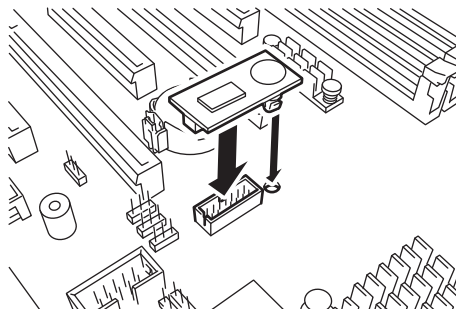
This section describes the procedure for installing optional TPM Kit.



### 1.9.1 Installation

Install TPM Kit in the following procedure.

1. See steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Install TPM Kit and secure it by pushing the nylon rivet attached to TPM Kit.



#### Important

**The TPM kit once installed cannot be removed.**

**Ask your sales representative for removal of TPM Kit.**

## 1.10 Processor (CPU)

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

### Important

- You must avoid static electricity to work with the procedure below. For details, see *Chapter 2 (1.2 Anti-static Measures)*.
- 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.

### Tips

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

### 1.10.1 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 2008 R2 Standard (x64) Microsoft Windows Server 2008 R2 Enterprise (x64)	256 *1	56
Microsoft Windows Server 2012 Standard Microsoft Windows Server 2012 Datacenter Microsoft Windows Server 2012 R2 Standard Microsoft Windows Server 2012 R2 Datacenter	640 *1	56
VMware ESXi 5.5 VMware ESXi 6.0	320	56

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

Windows Server 2008 R2: 64

Windows Server 2012, Windows Server 2012 R2: 320



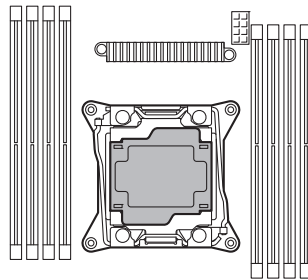
### 1.10.2 Installation

Follow the steps below to install the CPU.

**Note**

CPU#1 heat sink and CPU#2 heat sink differ.  
When adding the CPU, use optional heat sink.

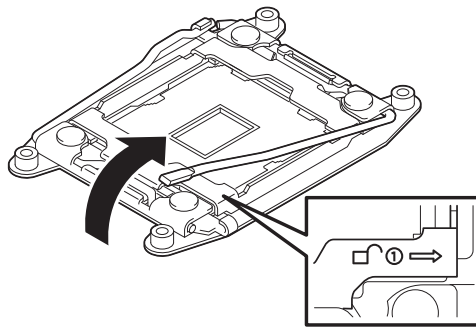
1. See steps 1 to 8 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Locate the CPU socket to which you are going to install a CPU.
3. Remove the protective cover from the CPU socket.



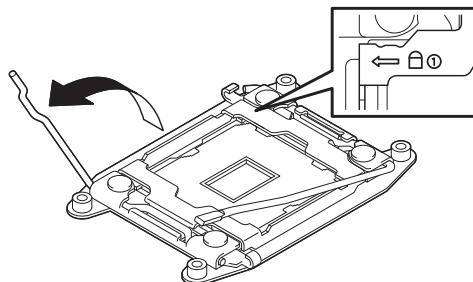
**Note**

Keep the removed protective cover for future use.

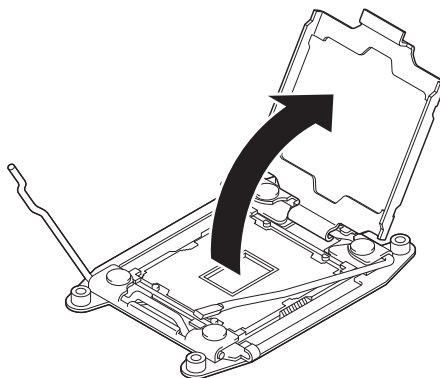
4. Push down the socket lever marked with "→ ①" to unlatch it from the hook, and then slowly open the lever until it stops.



5. Push down the socket lever marked with "← ①" to unlatch it from the hook, and then slowly open the lever until it stops.



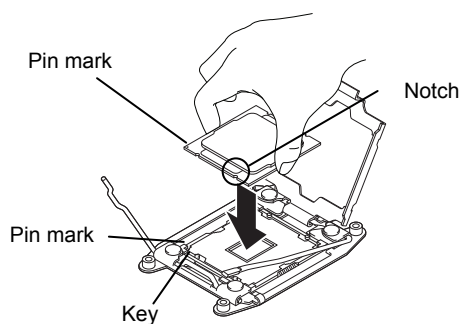
6. Lift the plate.



**Important** Do not touch the socket contacts.

7. Put the additional CPU on the CPU socket slowly and gently.

For easy installation, hold edges of the CPU with your thumb and index fingers so that the notch is aligned with the key on the CPU socket.

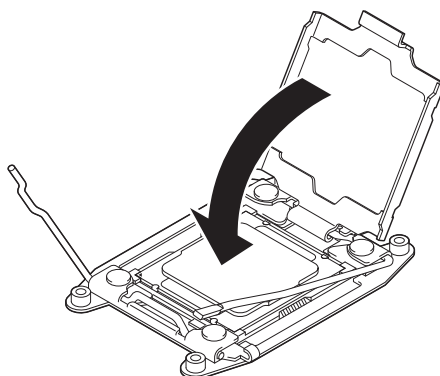


**Important** Be sure to hold the CPU only at the edges. **Pay attention not to touch the bottom of the CPU (pin section).**

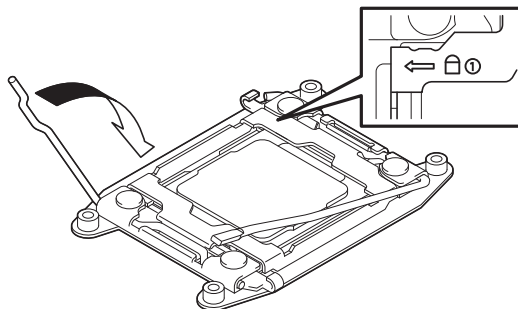
**Note**

- Insert the CPU while aligning the notch on the CPU with the key on the CPU socket.
- Bring down the CPU straight without tilting or sliding it in the socket.

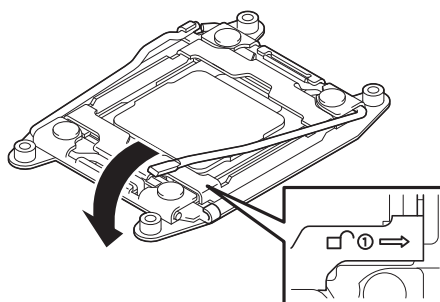
8. Press the processor lightly onto the CPU socket, and then pull down the CPU socket holder.



9. Push down and lock the lever on the side marked "← ①".



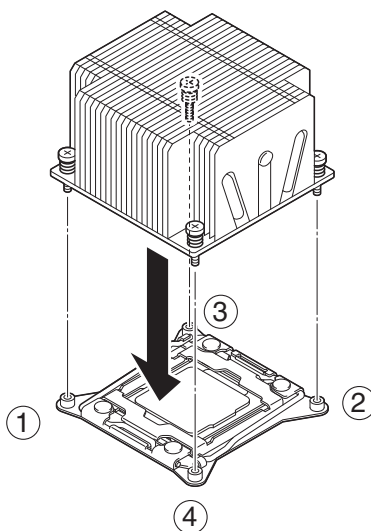
10. Push down and lock the lever on the side marked "↵ ① →".



11. Put the heat sink on the CPU and secure it by using four screws.

When securing the screws, temporarily tighten the four screws in a crosswise pattern, and then tighten them securely. Make sure to align each screw and screw hole; otherwise, the screws may damage the motherboard.

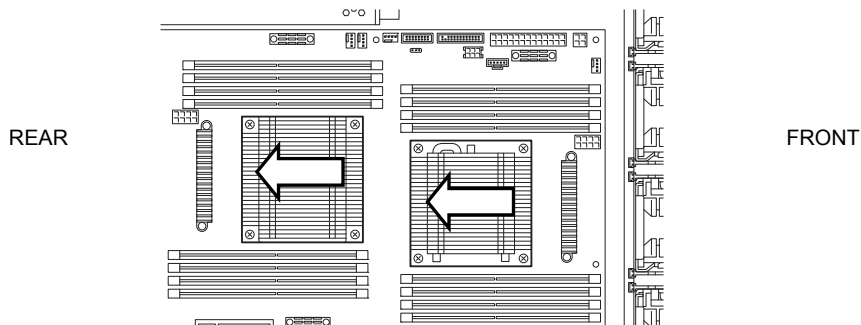
When putting the heat sink on the CPU, also pay attention not to touch the components around the CPU socket.



**Note**

The heat sink must be mounted in the predefined direction. Make sure the direction of heat sink before mounting it.

The label indicating the mounting orientation of the CPU#2 heat sink is affixed to the side surface of the heat sink.



12. 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.
  - Some screws are not completely tightened.
- Do not move the secured heat sink.

13. Continue to install or remove internal optional devices, mount and connect the server, and then turn it on.
14. Run BIOS Setup Utility (SETUP) to confirm the following settings. See *Chapter 3 (2. BIOS Setup Utility (SETUP))*.

**Advanced → Processor Configuration → Processor Information**

[CPU ID]  
[L2 Cache RAM]  
[L3 Cache RAM]

### 1.10.3 Replacement / Removal

---

To remove CPU, reverse the installation procedure.

When you removed the CPU, be sure to mount the protective cover on the CPU socket.

**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.

Perform the following steps after replacing or removing the CPU.

1. Run BIOS Setup Utility (SETUP) to confirm the following settings. See *Chapter 2 (1. System BIOS)* in "Maintenance Guide".

**Advanced → Processor Configuration → Processor Information**

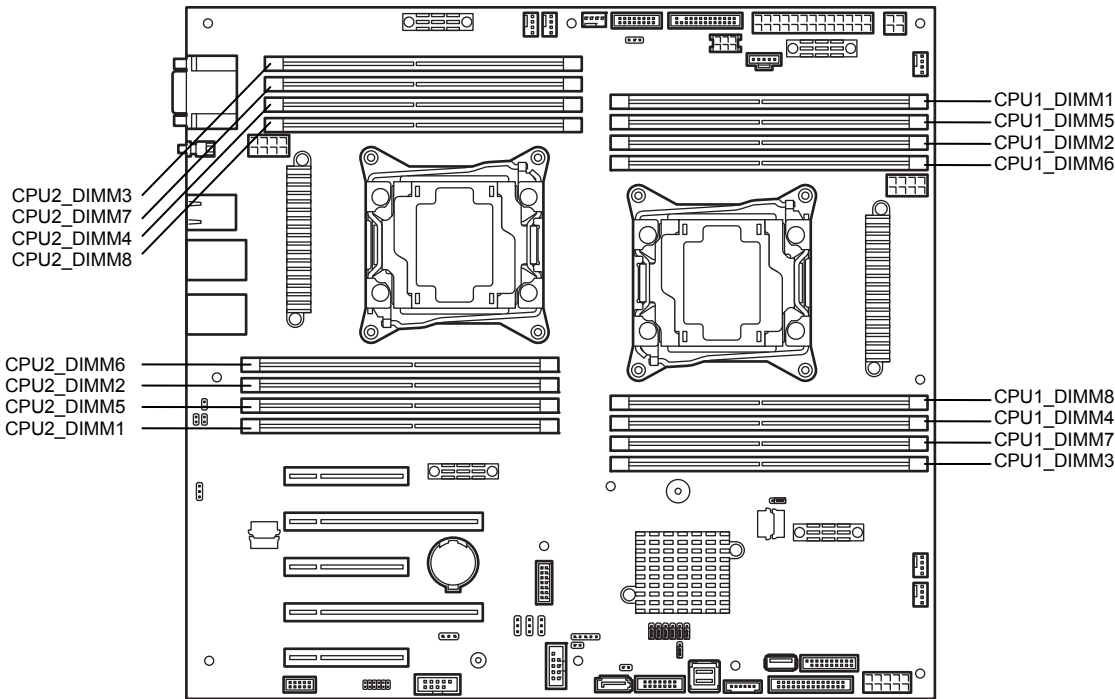
[CPU ID]

[L2 Cache RAM]

[L3 Cache RAM]

1.11 DIMM

Install a Dual Inline Memory Module (DIMM) to a DIMM socket on the motherboard in the server. The motherboard provides 16 sockets to install DIMMs.



Important

- You must avoid static electricity to work with the procedure below. For details, see *Chapter 2 (1.2 Anti-static Measures)*.
- 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 512 GB (32 GB x 16) can be installed in 2-CPU configuration. Up to 256 GB (32 GB x 8) can be installed in 1-CPU configuration. No DIMM is factory installed in standard configuration.

### 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 2008 R2 Standard *1	32 GB	32 GB
Microsoft Windows Server 2008 R2 Enterprise *1	2 TB	512 GB
Microsoft Windows Server 2012 Standard *1 Microsoft Windows Server 2012 Datacenter *1 Microsoft Windows Server 2012 R2 Standard *1 Microsoft Windows Server 2012 R2 Datacenter *1	4 TB	512 GB
VMware ESXi 5.5 *2 VMware ESXi 6.0 *2	4 TB	512 GB

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

- Windows Server 2008 R2 Standard: 32 GB
- Windows Server 2008 R2 Enterprise: 1 TB
- Windows Server 2012, Windows Server 2012 R2: 4TB

\*2: Up to 1 TB on virtual machine.

### 1.11.2 Memory clock

The server supports the memory clock speed of DDRL4-1600/1866/2133/2400MHz but the actual memory clock speed depends on CPU and memory configuration. The all of DIMMs operate at the same clock speed.

Model Number (CPU)	DIMM type	Number of DIMMs (per 1 CPU)	Clock speed
N8101-1068F (E5-2603v4) N8101-1069F (E5-2609v4)	N8102-686F 4GB DDR4-2400 REG Memory Kit (1x4GB) N8102-687F 8GB DDR4-2400 REG Memory Kit (1x8GB) N8102-688F 16GB DDR4-2400 REG Memory Kit (1x16GB) N8102-689F 32GB DDR4-2400 REG Memory Kit (1x32GB)	Up to 8 sets (8 DIMMs)	1866 MHz
	N8102-691 16GB DDR4-2400 REG Memory Kit (2x8GB) N8102-692 32GB DDR4-2400 REG Memory Kit (2x16GB)	Up to 4 sets (8 DIMMs)	
	N8102-693 16GB DDR4-2400 REG Memory Kit (2x8GB) N8102-694 32GB DDR4-2400 REG Memory Kit (2x16GB)	Up to 4 sets (8 DIMMs)	
N8101-1070F (E5-2620v4) N8101-1071F (E5-2623v4) N8101-1072F (E5-2630v4)	N8102-686F 4GB DDR4-2400 REG Memory Kit (1x4GB) N8102-687F 8GB DDR4-2400 REG Memory Kit (1x8GB) N8102-688F 16GB DDR4-2400 REG Memory Kit (1x16GB) N8102-689F 32GB DDR4-2400 REG Memory Kit (1x32GB)	Up to 8 sets (8 DIMMs)	2133 MHz
	N8102-691 16GB DDR4-2400 REG Memory Kit (2x8GB) N8102-692 32GB DDR4-2400 REG Memory Kit (2x16GB)	Up to 4 sets (8 DIMMs)	
	N8102-693 16GB DDR4-2400 REG Memory Kit (2x8GB) N8102-694 32GB DDR4-2400 REG Memory Kit (2x16GB)	Up to 4 sets (8 DIMMs)	
N8101-1073F (E5-2650v4) N8101-1074F (E5-2660v4) N8101-1075F (E5-2690v4)	N8102-686F 4GB DDR4-2400 REG Memory Kit (1x4GB) N8102-687F 8GB DDR4-2400 REG Memory Kit (1x8GB) N8102-688F 16GB DDR4-2400 REG Memory Kit (1x16GB) N8102-689F 32GB DDR4-2400 REG Memory Kit (1x32GB)	Up to 8 sets (8 DIMMs)	2400 MHz
	N8102-691 16GB DDR4-2400 REG Memory Kit (2x8GB) N8102-692 32GB DDR4-2400 REG Memory Kit (2x16GB)	Up to 4 sets (8 DIMMs)	
	N8102-693 16GB DDR4-2400 REG Memory Kit (2x8GB) N8102-694 32GB DDR4-2400 REG Memory Kit (2x16GB)	Up to 4 sets (8 DIMMs)	



### 1.11.3 Memory RAS feature

The server supports the following RAS features. Some restrictions (such as DIMM installation location) are imposed on using the Memory Mirroring or Memory LockStep Memory Sparing feature. See *Chapter 2 (1.11.7 Using Memory RAS feature)* for conditions appropriate to your requirements.

- Standard memory feature (x4 SDDC ECC memory)
- Memory Mirroring feature (restrictions imposed on DIMM configuration)
- Memory LockStep feature (x8 SDDC ECC memory) (restrictions imposed on DIMM configuration)
- Memory Sparing feature (restrictions imposed on DIMM configuration)

Supported RAS features depend on additional memory card.

See the table below for RAS features supported by additional memory card.

**List of features supported by additional memory card**

Model Number and Product Name	Standard feature (x4 SDDC)	Memory Mirroring feature	Memory LockStep feature (x8 SDDC)	Memory Sparing feature
N8102-686F 4GB DDR4-2400 REG Memory Kit (1x4GB)	N/A	N/A	N/A	N/A
N8102-687F 8GB DDR4-2400 REG Memory Kit (1x8GB)	N/A	N/A	N/A	N/A
N8102-688F 16GB DDR4-2400 REG Memory Kit (1x16GB)	○	N/A	N/A	N/A
N8102-689F 32GB DDR4-2400 REG Memory Kit (1x32GB)	○	N/A	N/A	N/A
N8102-691 16GB DDR4-2400 REG Memory Kit (2x8GB)	N/A	○	○	N/A
N8102-692 32GB DDR4-2400 REG Memory Kit (2x16GB)	N/A	○	○	N/A
N8102-693 16GB DDR4-2400 REG Memory Kit (2x8GB)	N/A	N/A	N/A	○
N8102-694 32GB DDR4-2400 REG Memory Kit (2x16GB)	N/A	N/A	N/A	○

○: Supported

### 1.11.4 DIMM installation order

**Note**

- DIMM installation order in 1-CPU configuration differs from that in 2-CPU configuration.
- If CPU2 is not installed, CPU2\_DIMM1 to CPU2\_DIMM8 are disabled.
- See *List of features supported by additional memory card* in 1.11.3 *Memory RAS feature* before using memory RAS feature.

In 1-CPU configuration, install DIMMs starting from the smallest slot number.

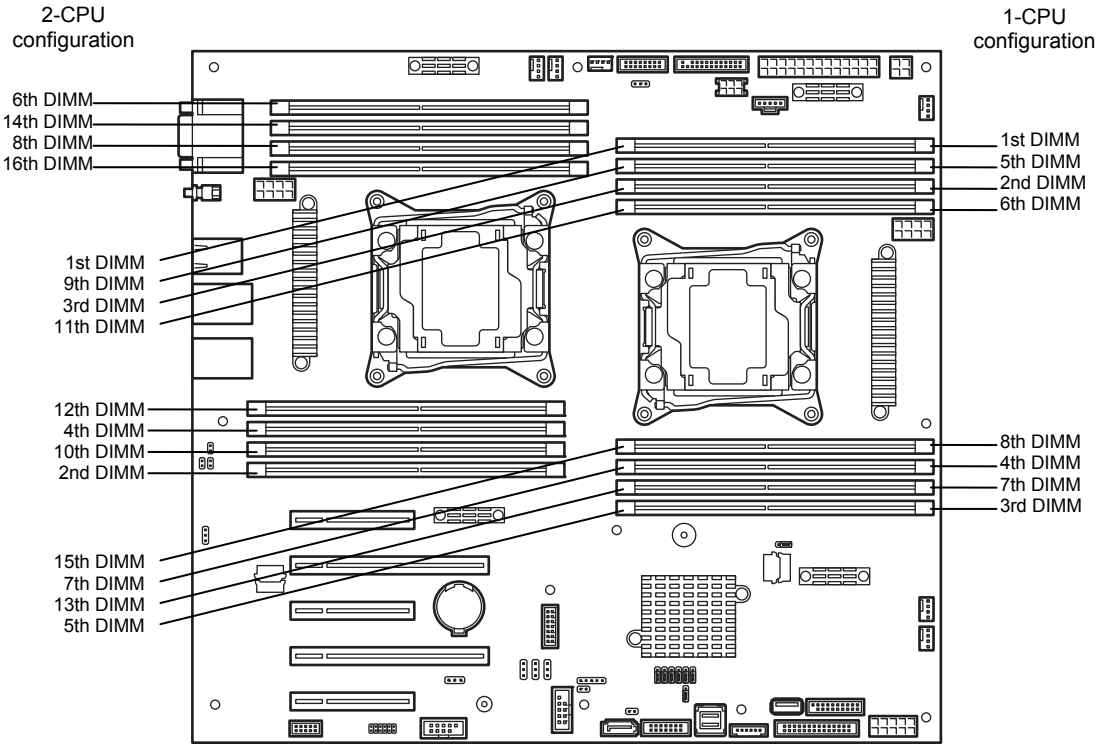
In 2-CPU configuration, alternately install DIMMs starting from the smallest slot number of each CPU.

Installation order depends on combination of DIMMs to be installed.

See the table below to find allowable combination of DIMMs, and install DIMMs starting from the largest capacity and from the smallest slot number.

Model Number	N8102-							
	686F	687F	688F	689F	691	692	693	694
N8102-686F	○	○	○	○	N/A	N/A	N/A	N/A
N8102-687F	○	○	○	○	N/A	N/A	N/A	N/A
N8102-688F	○	○	○	○	N/A	N/A	N/A	N/A
N8102-689F	○	○	○	○	N/A	N/A	N/A	N/A
N8102-691	N/A	N/A	N/A	N/A	○	○	N/A	N/A
N8102-692	N/A	N/A	N/A	N/A	○	○	N/A	N/A
N8102-693	N/A	N/A	N/A	N/A	N/A	N/A	○	○
N8102-694	N/A	N/A	N/A	N/A	N/A	N/A	○	○

○: Allowed to be install together

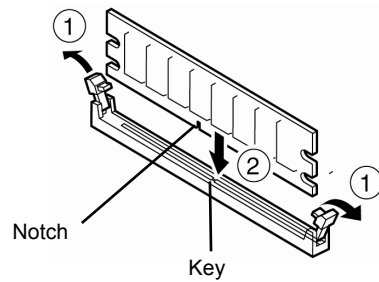


Slot	DIMM Installation Order	
	1-CPU configuration	2-CPU configuration
CPU1_DIMM1	1	1
CPU1_DIMM2	2	3
CPU1_DIMM3	3	5
CPU1_DIMM4	4	7
CPU1_DIMM5	5	9
CPU1_DIMM6	6	11
CPU1_DIMM7	7	13
CPU1_DIMM8	8	15
CPU2_DIMM1	—	2
CPU2_DIMM2	—	4
CPU2_DIMM3	—	6
CPU2_DIMM4	—	8
CPU2_DIMM5	—	10
CPU2_DIMM6	—	12
CPU2_DIMM7	—	14
CPU2_DIMM8	—	16

### 1.11.5 Installation

Install a DIMM by using the following procedure.

1. See steps 1 to 8 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Open levers at both ends of the target DIMM slot.
3. Push the DIMM straight into the socket.  
When a DIMM is inserted into the socket, 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 socket. Doing so can damage the socket or terminal part.

4. Continue to install or remove internal optional devices, mount and connect the server, and turn it on.
5. Confirm that no error messages are displayed in POST screen.  
If any error messages are displayed, see *Chapter 3 (1. POST Error Message)* in "Maintenance Guide".
6. Run BIOS Setup Utility, and select **Memory Configuration** and then **Memory Information** from the **Advanced** menu. Make sure the capacity of added DIMM is displayed properly.  
See *Chapter 3 (2. BIOS Setup Utility (SETUP))*.
7. Select **Memory Configuration** from the **Advanced** menu, and then specify **Yes** for **Memory Retest**.  
After that, select **Save Changes and Exit** to reboot.
8. If using a Windows OS, see *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "Installation Guide (Windows)".  
For other OS, follow the manual of the OS.

#### Tips

We recommend that the size of paging file be set to the recommended size (total memory size x 1.5) or more.

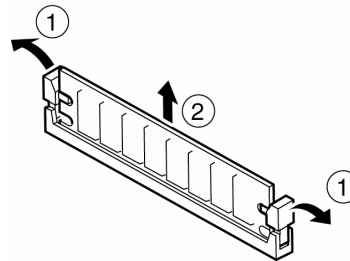
### 1.11.6 Removal / Replacement

Remove a DIMM in the following procedure.

**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.
- At least one DIMM needs to be installed for the server to operate.

1. See steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Open levers of the DIMM socket outward.  
The socket is unlocked and DIMM can be removed.
3. Pull out the DIMM straight.



4. Confirm that no error messages are displayed on POST. If any error message is displayed, see *Chapter 3 (1. POST Error Message)* in "*Maintenance Guide*".
5. Run BIOS Setup Utility, select **Memory Configuration** from the **Advanced** menu, and then specify **Yes** for **Memory Retest**. After that, select **Save Changes and Exit** to reboot.
6. If using a Windows OS, see *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "*Installation Guide (Windows)*".  
For other OS, follow the manual of the OS.

**Tips**

We recommend that the size of paging file be set to the recommended size (total memory size x 1.5) or more.

### 1.11.7 Cluster On Die and Early Snoop features

To set the Cluster On Die option to Enabled on Advanced -> Memory Configuration submenu in system BIOS setup utility (SETUP), note the number of DIMMs to be installed.

- For 1-CPU configuration  
Install DIMM on at least all of CPU1\_DIMM1 to DIMM3 slots.
- For 2-CPU configuration  
Install DIMM on at least all of CPU1\_DIMM1 to DIMM3 and CPU2\_DIMM1 to DIMM3 slots.

For effective use of the Cluster On Die feature, the recommended number of DIMMs to be installed is as follows:

- For 1-CPU configuration  
Install DIMM on CPU1\_DIMM1 to DIMM4 slots.  
Otherwise, install DIMM on CPU1\_DIMM1 to DIMM8 slots.
- For 2-CPU configuration  
Install DIMM to CPU1\_DIMM1 on DIMM4 and CPU2\_DIMM1 to DIMM4 slots.  
Otherwise, install DIMM on CPU1\_DIMM1 to DIMM8 and CPU2\_DIMM1 to DIMM8 slots.

- For 1-CPU configuration (Memory RAS Mode: Independent)

No. of installing DIMMs	Cluster On Die feature	Target DIMM slot
1	Not available	CPU1_DIMM1
2	Not available	CPU1_DIMM1 to CPU1_DIMM2
3	Available	CPU1_DIMM1 to CPU1_DIMM3
4	Available (recommended)	CPU1_DIMM1 to CPU1_DIMM4
5	Available	CPU1_DIMM1 to CPU1_DIMM5
6	Available	CPU1_DIMM1 to CPU1_DIMM6
7	Available	CPU1_DIMM1 to CPU1_DIMM7
8	Available (recommended)	CPU1_DIMM1 to CPU1_DIMM8

- For 1-CPU configuration (Memory RAS Mode: Independent/ Mirroring/ Lockstep)

No. of installing DIMMs	Cluster On Die feature	Target DIMM slot
2	Not available	CPU1_DIMM1 to CPU1_DIMM2
4	Available (recommended)	CPU1_DIMM1 to CPU1_DIMM4
6	Available	CPU1_DIMM1 to CPU1_DIMM6
8	Available (recommended)	CPU1_DIMM1 to CPU1_DIMM8

- For 1-CPU configuration (Memory RAS Mode: Sparing)

No. of installing DIMMs	Cluster On Die feature	Target DIMM slot
2	Not available	CPU1_DIMM1 & CPU1_DIMM5
4	Not available	CPU1_DIMM1 to CPU1_DIMM2 CPU1_DIMM5 to CPU1_DIMM6
6	Available	CPU1_DIMM1 to CPU1_DIMM3 CPU1_DIMM5 to CPU1_DIMM7
8	Available (recommended)	CPU1_DIMM1 to CPU1_DIMM8

- For 2-CPU configuration (Memory RAS Mode: Independent)

No. of installing DIMMs	Cluster On Die feature	Target DIMM slot
1	Not available	CPU1_DIMM1
2	Not available	CPU1_DIMM1 & CPU2_DIMM1
3	Not available	CPU1_DIMM1 to CPU1_DIMM2 CPU2_DIMM1
4	Not available	CPU1_DIMM1 to CPU1_DIMM2 CPU2_DIMM1 to CPU2_DIMM2
5	Not available	CPU1_DIMM1 to CPU1_DIMM3 CPU2_DIMM1 to CPU2_DIMM2
6	Available	CPU1_DIMM1 to CPU1_DIMM3 CPU2_DIMM1 to CPU2_DIMM3
7	Available	CPU1_DIMM1 to CPU1_DIMM4 CPU2_DIMM1 to CPU2_DIMM3
8	Available (recommended)	CPU1_DIMM1 to CPU1_DIMM4 CPU2_DIMM1 to CPU2_DIMM4
9	Available	CPU1_DIMM1 to CPU1_DIMM5 CPU2_DIMM1 to CPU2_DIMM4
10	Available	CPU1_DIMM1 to CPU1_DIMM5 CPU2_DIMM1 to CPU2_DIMM5
11	Available	CPU1_DIMM1 to CPU1_DIMM6 CPU2_DIMM1 to CPU2_DIMM5
12	Available	CPU1_DIMM1 to CPU1_DIMM6 CPU2_DIMM1 to CPU2_DIMM6
13	Available	CPU1_DIMM1 to CPU1_DIMM7 CPU2_DIMM1 to CPU2_DIMM6
14	Available	CPU1_DIMM1 to CPU1_DIMM7 CPU2_DIMM1 to CPU2_DIMM7
15	Available	CPU1_DIMM1 to CPU1_DIMM8 CPU2_DIMM1 to CPU2_DIMM7
16	Available (recommended)	CPU1_DIMM1 to CPU1_DIMM8 CPU2_DIMM1 to CPU2_DIMM8

- For 2-CPU configuration (Memory RAS Mode: Mirroring/ Lockstep)

No. of installing DIMMs	Cluster On Die feature	Target DIMM slot
4	Not available	CPU1_DIMM1 to CPU1_DIMM2 CPU2_DIMM1 to CPU2_DIMM2
6	Not available	CPU1_DIMM1 to CPU1_DIMM4 CPU2_DIMM1 to CPU2_DIMM2
8	Available (recommended)	CPU1_DIMM1 to CPU1_DIMM4 CPU2_DIMM1 to CPU2_DIMM4
10	Available	CPU1_DIMM1 to CPU1_DIMM6 CPU2_DIMM1 to CPU2_DIMM4
12	Available	CPU1_DIMM1 to CPU1_DIMM6 CPU2_DIMM1 to CPU2_DIMM6
14	Available	CPU1_DIMM1 to CPU1_DIMM8 CPU2_DIMM1 to CPU2_DIMM6
16	Available (recommended)	CPU1_DIMM1 to CPU1_DIMM8 CPU2_DIMM1 to CPU2_DIMM8

- For 2-CPU configuration (Memory RAS Mode: Sparing)

No. of installing DIMMs	Cluster On Die feature	Target DIMM slot
4	Not available	CPU1_DIMM1 & CPU1_DIMM5 CPU2_DIMM1 & CPU2_DIMM5
6	Not available	CPU1_DIMM1 to CPU1_DIMM2 CPU1_DIMM5 to CPU1_DIMM6 CPU2_DIMM1 & CPU2_DIMM5
8	Not available	CPU1_DIMM1 to CPU1_DIMM2 CPU1_DIMM5 to CPU1_DIMM6 CPU2_DIMM1 to CPU2_DIMM2 CPU2_DIMM5 to CPU2_DIMM6
10	Not available	CPU1_DIMM1 to CPU1_DIMM3 CPU1_DIMM5 to CPU1_DIMM7 CPU2_DIMM1 to CPU2_DIMM2 CPU2_DIMM5 to CPU2_DIMM6
12	Available	CPU1_DIMM1 to CPU1_DIMM3 CPU1_DIMM5 to CPU1_DIMM7 CPU2_DIMM1 to CPU2_DIMM3 CPU2_DIMM5 to CPU2_DIMM7
14	Available	CPU1_DIMM1 to CPU1_DIMM8 CPU2_DIMM1 to CPU2_DIMM3 CPU2_DIMM5 to CPU2_DIMM7
16	Available (recommended)	CPU1_DIMM1 to CPU1_DIMM8 CPU2_DIMM1 to CPU2_DIMM8



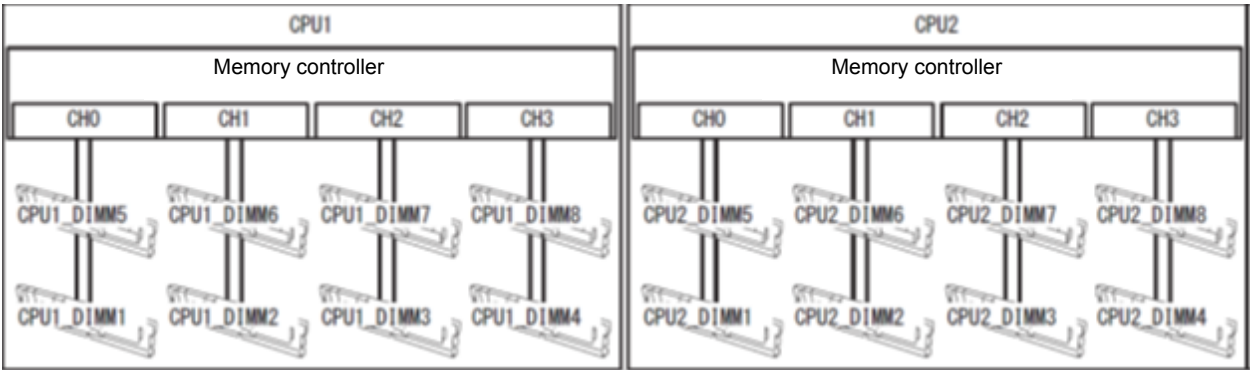
1.11.8 Using Memory RAS feature

This server has RAS feature including Standard Memory feature (x4 SDDC ECC memory), Memory Mirroring feature, Memory Sparing feature, and Memory Lock Step (x8 SDDC ECC memory) feature. Single Device Data Correction (SDDC) allows automatic correction of memory error (multi-bit error).

Note

- See *List of features supported by additional memory card* in 1.11.3 *Memory RAS feature* before using memory RAS feature.
- Only the features that additional memory card supports can be used.
- N8102-686F/687F/691/693 is not supported to x4 SDDC

The memory area on the motherboard of the server is divided into four memory channels.



Memory Mirroring and Memory Lock Step (x8 SDDC) features keep memory redundancy between memory channels by monitoring or altering memory active/inactive status, respectively.

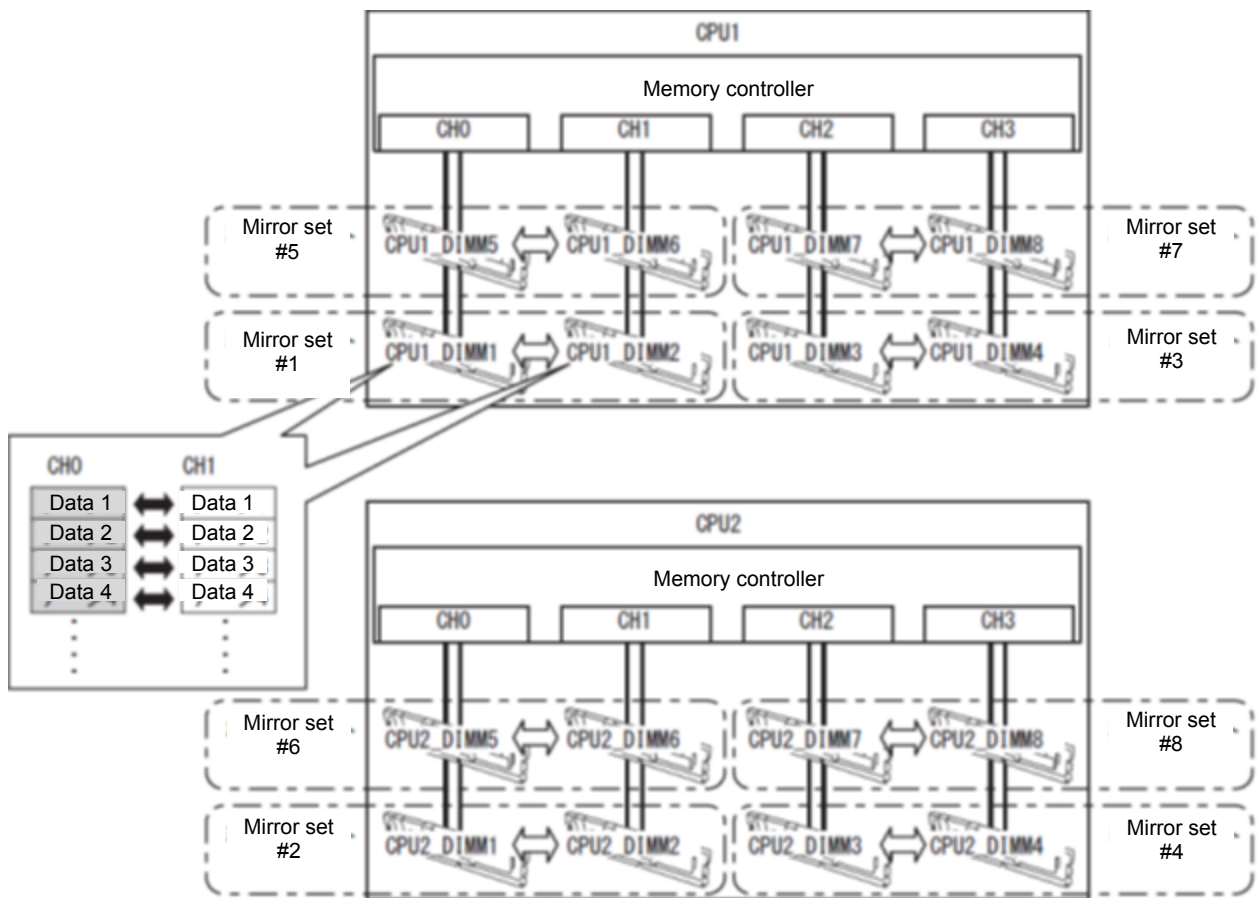
## (1) Memory mirroring feature

Memory Mirroring feature writes the same data into two groups of DIMMs (mirror set) corresponding with each other between memory channels (channels 0 and 1 or channel 2 and 3) to provide data redundancy.

### Note

- Memory Mirroring feature uses channels 0 and 1 or channels 2 and 3.
- To use Memory Mirroring feature, install N8102-691/692 additional memory card (two DIMMs of same model).
- DIMMs used in mirror set must be of the same model number.

Example: 2-CPU configuration

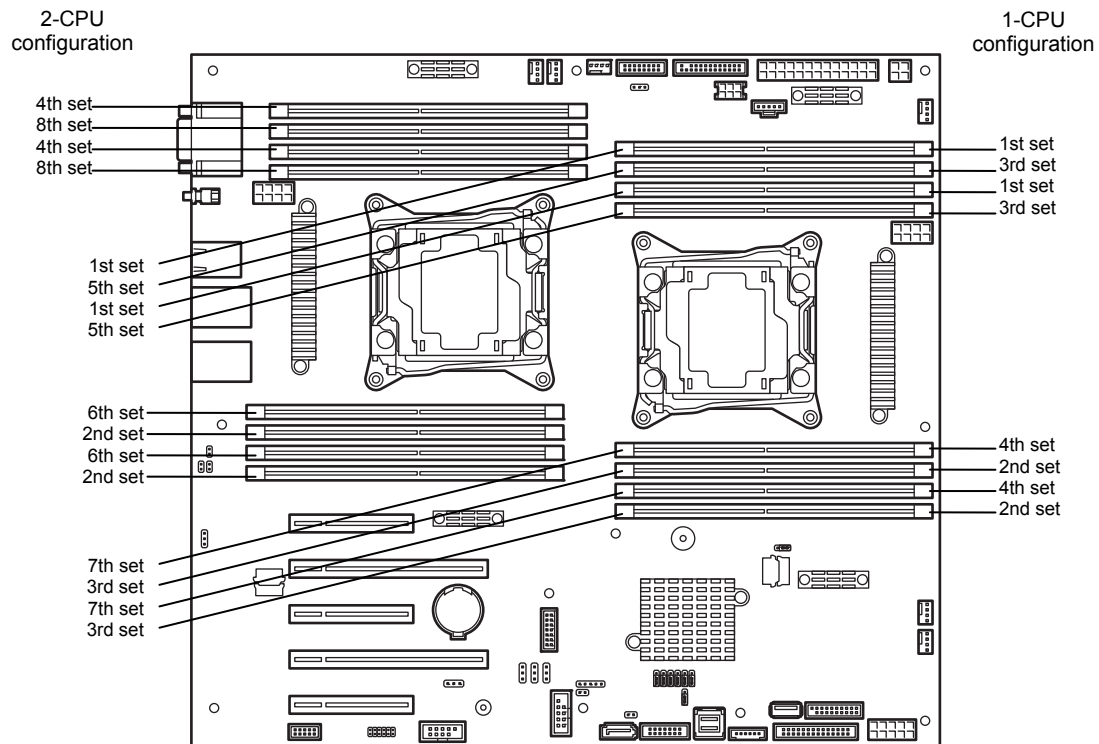


### Tips

The operating system can use a half of the total physical memory capacity.

The memory mirroring feature can be used under the following conditions:

- Install DIMMs in DIMM sockets to configure a mirror set.
- Use DIMMs having the same model number as DIMMs to be installed on a mirror set.
- See *Chapter 2 (1. System BIOS) in "Maintenance Guide"* to change parameters as shown below, save the settings, and exit from SETUP.  
**Advanced** → **Memory Configuration** → **Memory RAS Mode** → Change to **Mirroring**.
- After restarting, run SETUP again, and check if "**Mirrored**" is displayed for the following parameter.  
**Advanced** → **Memory Configuration** → **Memory Information** → **CPUX\_DIMMx Status**
- Memory Mirroring feature cannot be used together with Memory LockStep feature.
- Installation order depends on CPU configuration. See the figure below.



Slot	DIMM installation order	
	1-CPU configuration	2-CPU configuration
CPU1_DIMM1	1	1
CPU1_DIMM2	1	1
CPU1_DIMM3	2	3
CPU1_DIMM4	2	3
CPU1_DIMM5	3	5
CPU1_DIMM6	3	5
CPU1_DIMM7	4	7
CPU1_DIMM8	4	7
CPU2_DIMM1	–	2
CPU2_DIMM2	–	2
CPU2_DIMM3	–	4
CPU2_DIMM4	–	4
CPU2_DIMM5	–	6
CPU2_DIMM6	–	6
CPU2_DIMM7	–	8
CPU2_DIMM8	–	8

Memory mirroring cannot be configured in the following case:

- Memory mirroring within a specific memory channel

#### Notes on configuring memory mirroring

If you additionally install or remove DIMMs that unable to configure Memory Mirroring configuration, Memory RAS Mode is changed to "Independent".

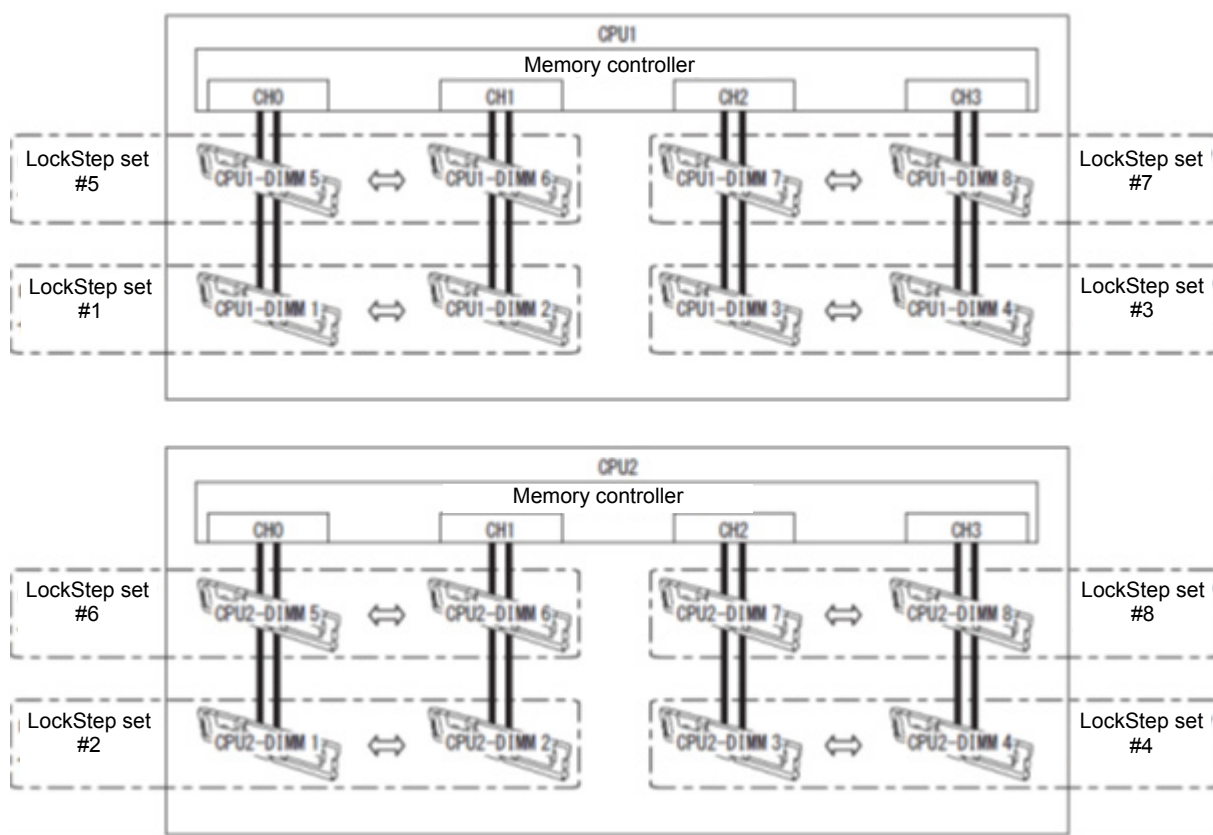
"Mirrored" is removed from **Advanced** → **Memory Configuration** → **Memory Information** → **CPUx\_DIMMx Status xxxx MB (Mirrored)** in BIOS SETUP.

## (2) Memory LockStep feature (x8 SDDC)

With the Memory LockStep feature, the DIMMs in two groups corresponding to two memory channels (channels 0 and 1, or channels 2 and 3) is multiplexed and operated in parallel to enable x8 SDDC. With this feature, a single device can detect and correct one to eight-bit error.

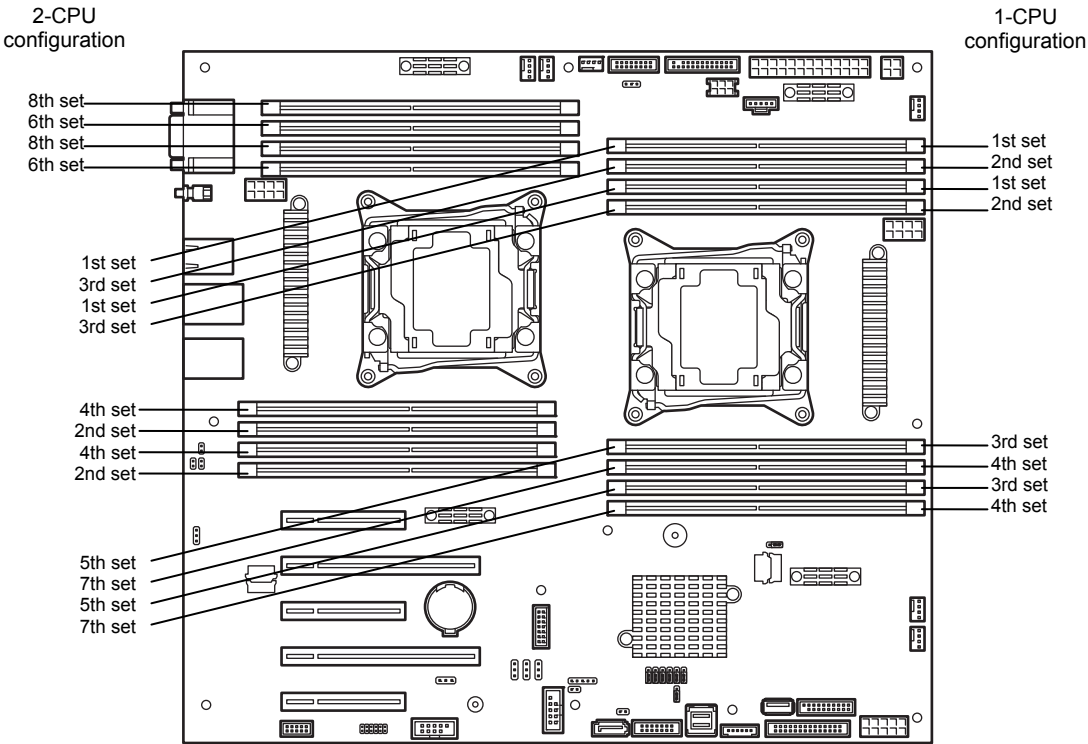
### Note

- Memory LockStep feature uses channels 0 and 1 or channels 2 and 3.
- To use Memory LockStep feature, install N8102-691/692 additional memory card (two DIMMs of same model).
- DIMMs used in LockStep set must be of the same model number.
- Any memory card other than N8102-691/692 additional memory card cannot be installed together.



The Memory LockStep feature can be used under the following conditions:

- Install DIMMs in DIMM socket to configure a LockStep set.
- All the installed DIMMs must be the same capacity.
- See *Chapter 2 (1. System BIOS) in "Maintenance Guide"* to change parameters as shown below.  
**Advanced** → **Memory Configuration** → **Memory RAS Mode** → Change to **LockStep**.
- After restarting, run SETUP again, and check if "**Lock Step**" is displayed for the following parameter.  
**Advanced** → **Memory Configuration** → **Memory Information** → **CPUX\_DIMMx Status**
- Installation order depends on CPU configuration. See the figure below.



Slot	DIMM installation order	
	1-CPU configuration	2-CPU configuration
CPU1_DIMM1	1	1
CPU1_DIMM2	1	1
CPU1_DIMM3	2	3
CPU1_DIMM4	2	3
CPU1_DIMM5	3	5
CPU1_DIMM6	3	5
CPU1_DIMM7	4	7
CPU1_DIMM8	4	7
CPU2_DIMM1	—	2
CPU2_DIMM2	—	2
CPU2_DIMM3	—	4
CPU2_DIMM4	—	4
CPU2_DIMM5	—	6
CPU2_DIMM6	—	6
CPU2_DIMM7	—	8
CPU2_DIMM8	—	8

Memory LockStep cannot be configured in the following cases:

- Memory LockStep between memory channels of different memory controllers (CPU)
- Memory LockStep within the same memory channel

#### Notes on configuring LockStep

If you additionally install or remove DIMMs that unable to configure Memory LockStep configuration, Memory RAS Mode is changed to "Independent".

"LockStep" is removed from **Advanced** → **Memory Configuration** → **Memory Information** → **CPUx\_DIMMx Status xxxx MB (LockStep)** in BIOS SETUP.

### (3) Memory sparing feature

The memory sparing feature puts a memory channel 2 of a memory controller in each CPU into standby status as spare devices. If a correctable error occurs in a DIMM in the active memory controller, the feature automatically changes the active DIMM from the failed one to a DIMM in the standby state to continue the processing.

**Note**

To use the Memory Sparing feature, install N8102-693/694 additional memory card (two DIMMs of same model).

DIMMs installed in the system must be of the same model number.

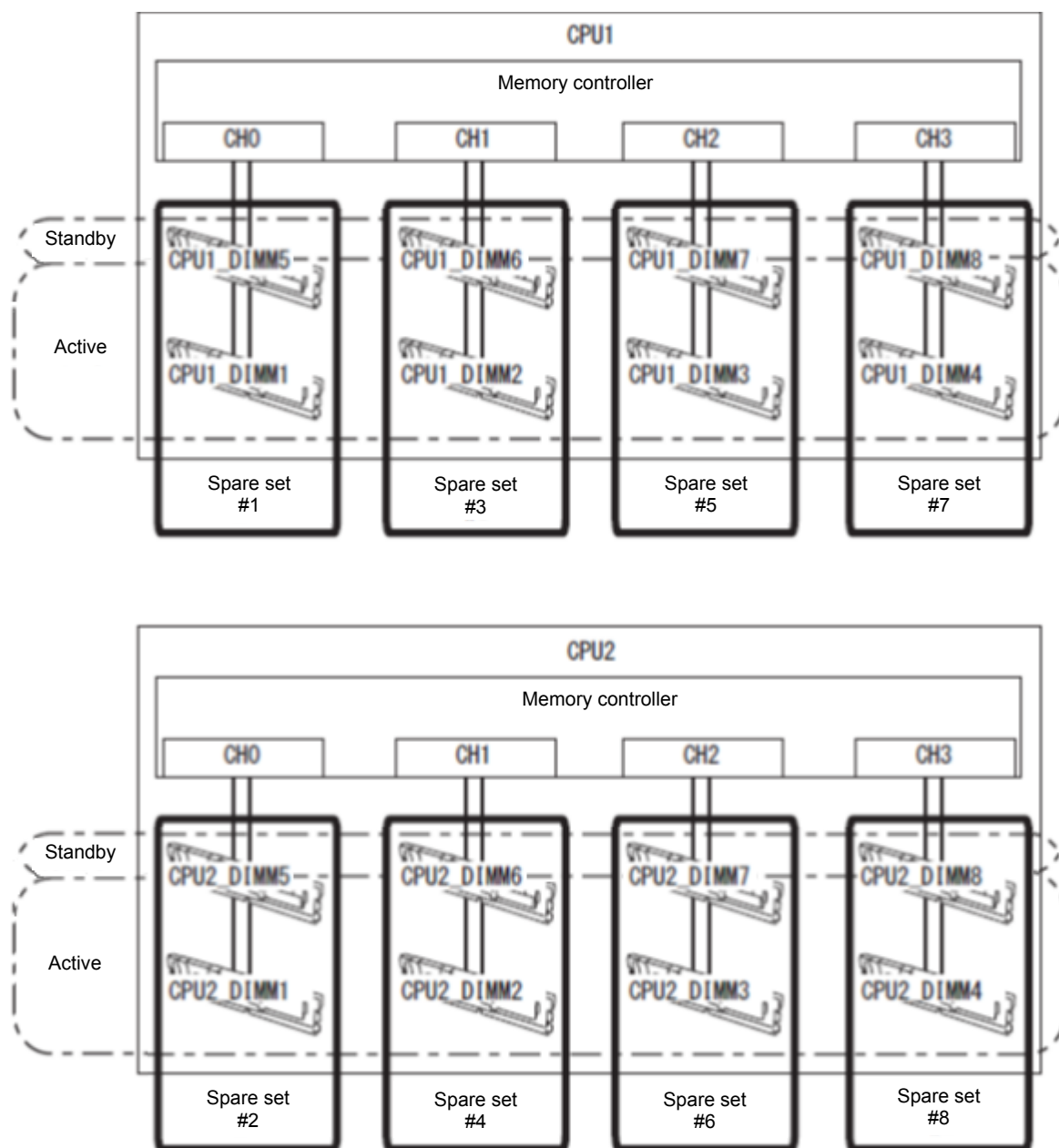
**Tips**

The operating system can use the DIMMs as those with capacities less than the actual physical capacities. The capacities vary depending on the number of DIMMs and the physical capacity per DIMM.

The following table shows configuration allowable for memory sparing and system logical memory capacity.

Number of CPUs	Number of DIMMs	Capacity of DIMM installed	
		N8102-693 (16 GB x2)	N8102-694 (32 GB x2)
1	2	24 GB	48 GB
	4	48 GB	96 GB
	6	72 GB	144 GB
	8	96 GB	192 GB
2	4	48 GB	96 GB
	6	72 GB	144 GB
	8	96 GB	192 GB
	10	120 GB	240 GB
	12	144 GB	288 GB
	14	168 GB	336 GB
	16	192 GB	384 GB

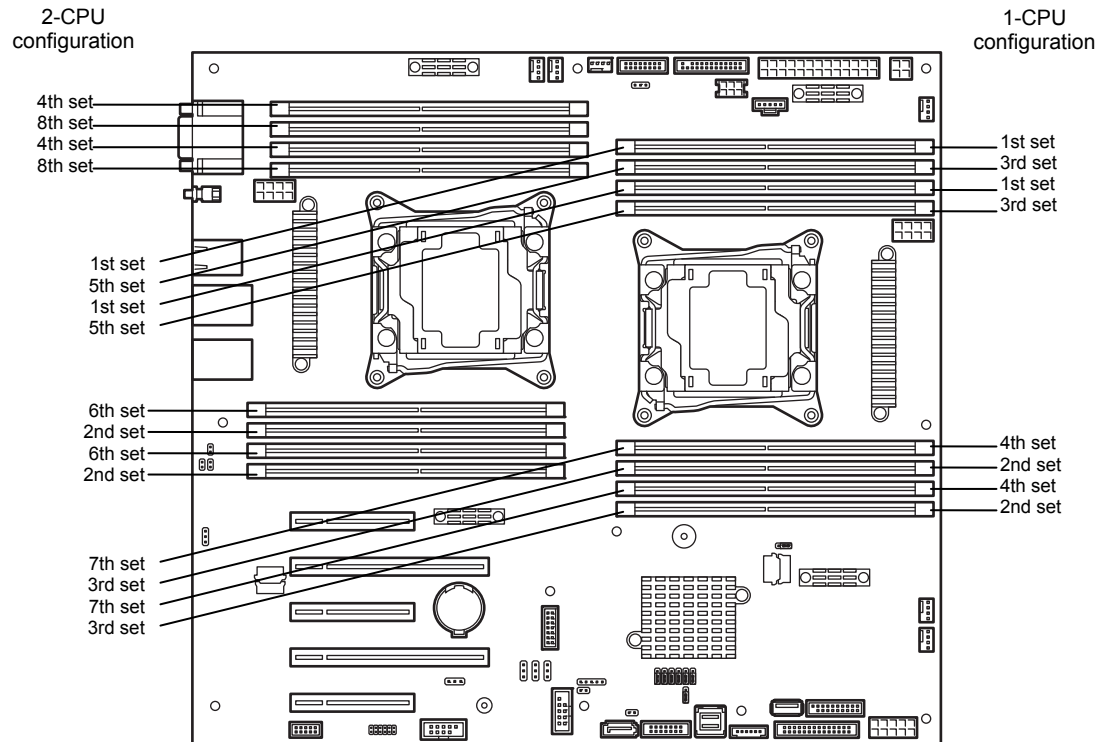




The Memory Sparing feature can be used under the following conditions:

- Install DIMMs in DIMM socket to configure a spare set.
- DIMMs to be installed must have the same capacity.
- See *Chapter 2 (1. System BIOS) in "Maintenance Guide"* to change parameters as shown below, save the settings, and exit from SETUP  
**Advanced** → **Memory Configuration** → **Memory RAS Mode** → Change to **Sparing**.
- After restarting, run SETUP again, and check if "**Spared**" is displayed for the following parameter.  
**Advanced** → **Memory Configuration** → **Memory Information** → **CPUx\_DIMMx Status**

- Installation order depends on CPU configuration. See the figure below.



The following Memory Sparing features cannot be configured.

- A DIMM of different capacity is installed.
- Sparing with DIMMs in different memory channel

#### Notes on configuring memory sparing

In memory sparing configuration, **Memory RAS Mode** menu is changed to "**Independent**" in the following cases:

- When you additionally install DIMMs that unable to configure memory sparing
- When you remove DIMMs that takes down memory sparing

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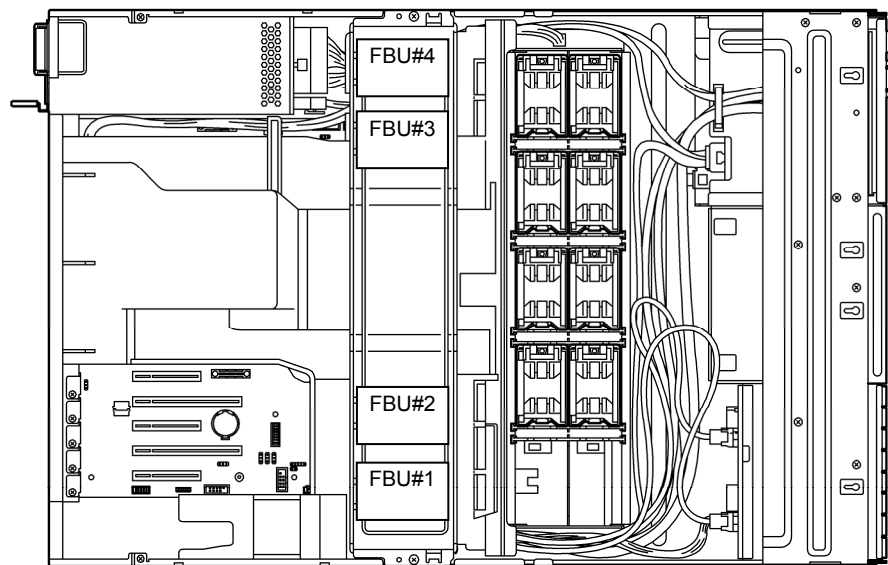
## 1.12 Flash Backup Unit for RAID Controller

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If a RAID controller (N8103-176/177/178/179) is installed, use the flash backup unit (FBU) to avoid data loss caused by accidents including temporary blackout during a Write Back operation. The model of the flash backup unit to be used depends on RAID controller.

- For N8103-176/177/178, use N8103-181 Flash Backup Unit
- For N8103-179, use FBU provided with N8103-179.

FBU is installed on the support bar of this server. The installation location and order of FBU are as shown in the following figure.



rear side

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### 1.12.1 Handling precautions

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Observe the followings when using FBU. Ignoring these precautions may cause damage to your data or other devices.

- Use the FBU appropriate to the RAID controller to be used.
- The FBU is an electronic device sensitive to static electricity. Before installation, touch the metal frame part of the server to discharge the static electricity from your body.
- Do not drop or bump the FBU.
- For recycling and disposing of the FBU, refer to the User's Guide that comes with the RAID controller or Flash Backup Unit.

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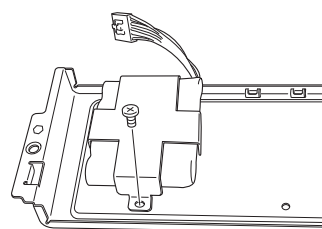
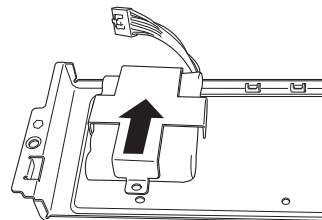
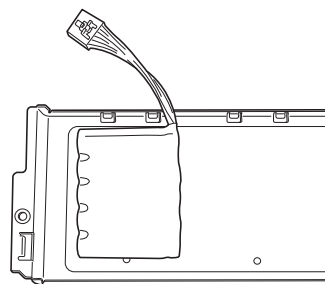
### 1.12.2 Installation

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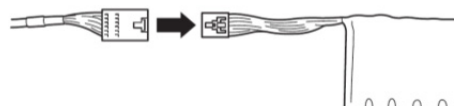
This section describes the procedure of installing a Flash Backup Unit (FBU) for RAID controller.

1. See steps 1 to 8 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.

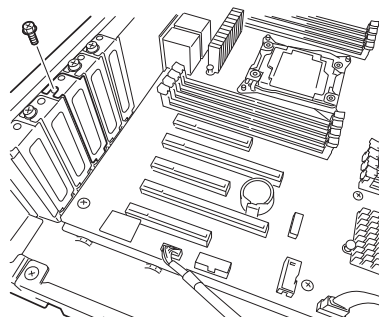
2. Put the FBU on Support Bar.  
Secure the FBU bracket that comes with FBU with FBU with one screw.



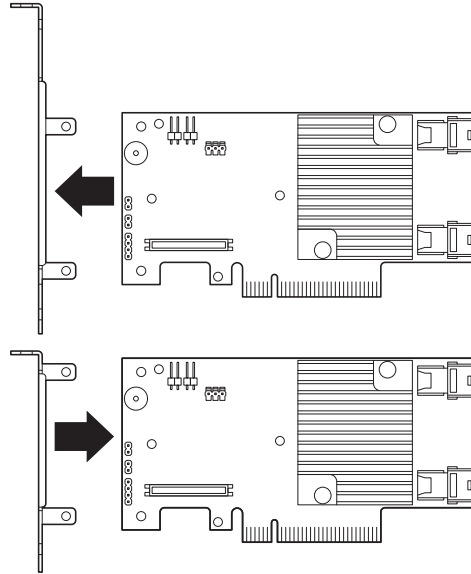
3. Connect the FBU control cable (650 mm) that comes with FBU.



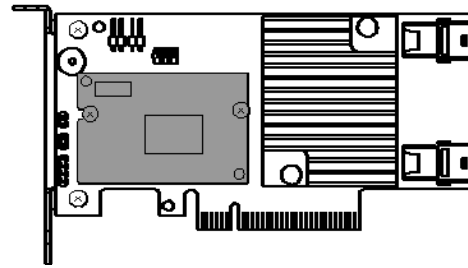
4. Remove one screw from the blank cover on the slot in which you are going to mount the RAID Controller, then remove the blank cover.



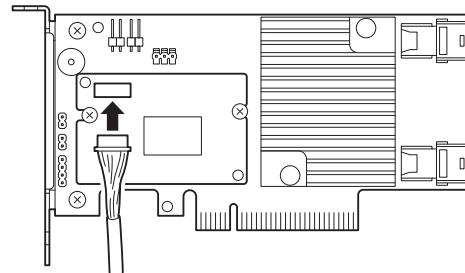
5. Remove the two screws from RAID Controller. Replace the PCI bracket with the one for low-profile card.



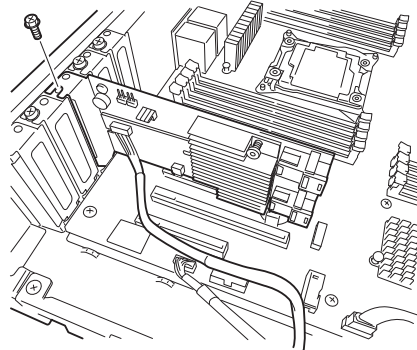
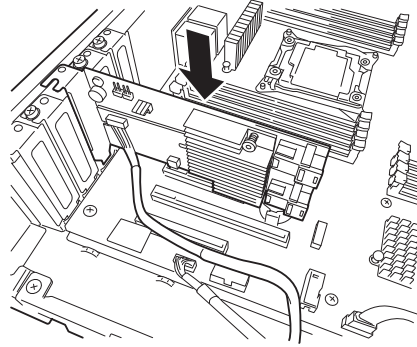
6. Mount the adapter to RAID controller.



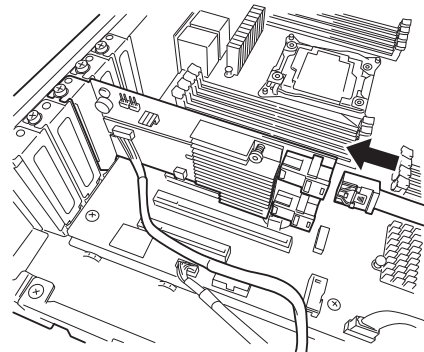
7. Connect the control cable of FBU to RAID controller.



8. Install the RAID Controller in PCI slot, and secure it with a screw you have removed in Step 4.



9. Connect Mini SAS HD cable to RAID controller.



### 1.12.3 Removal

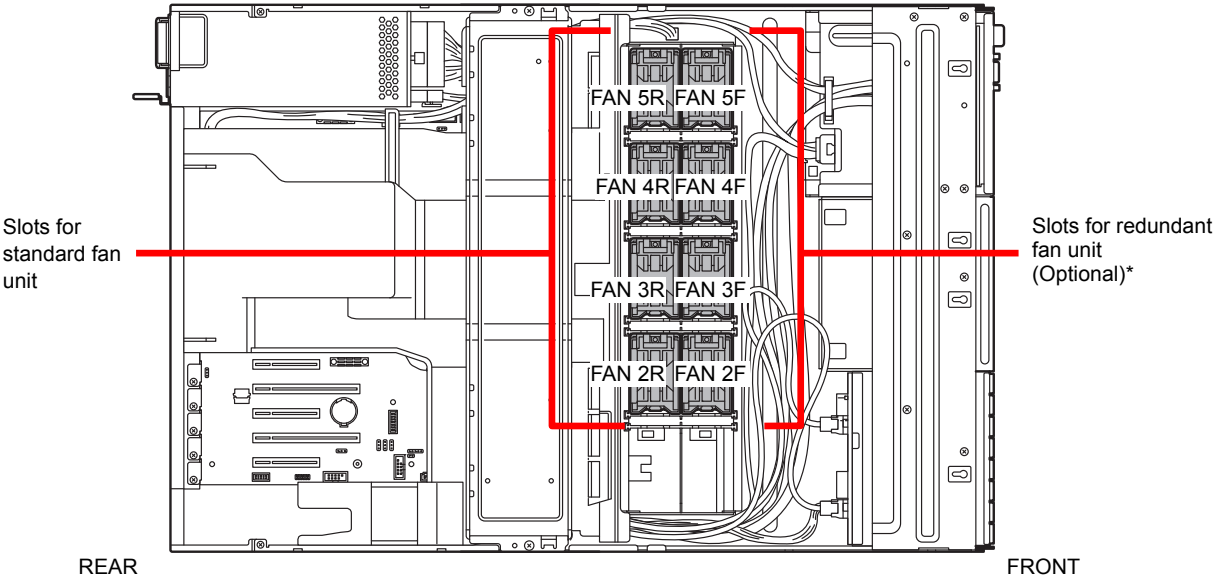
For removing the FBU for RAID controller, reverse the installation procedure.

# 1.13 Additional / Redundant Fan Unit

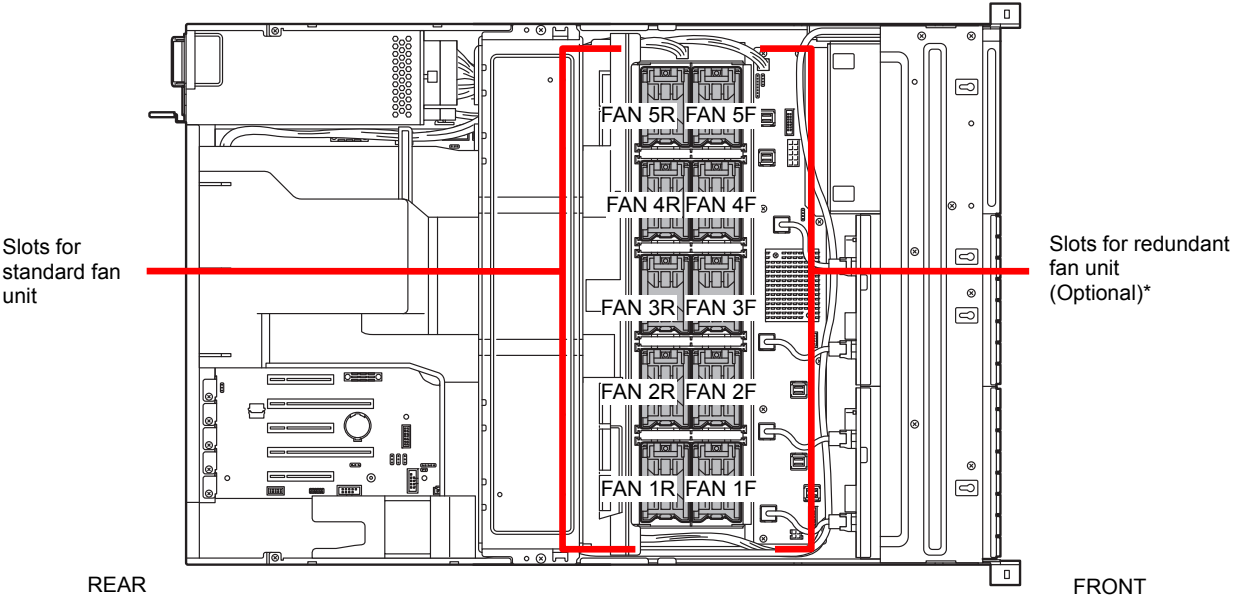
This server supports redundant cooling fan system with an additional cooling fan unit. The fan units are hot-swappable even while the system is powered-on and running.

The figure below shows the slot numbers assigned to the slots of standard and optional cooling fan units.

16x 2.5-inch Drive Model



26x 2.5-inch Drive Model / 3.5-inch Drive Model

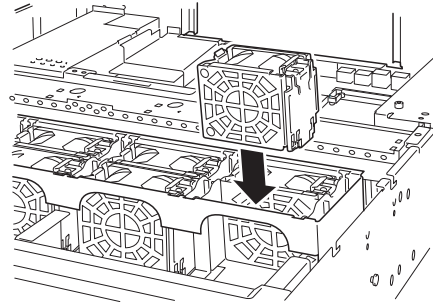


\* Slots to install redundant fan unit

### 1.13.1 Installation

Follow the steps below to install the fan unit.

1. See steps 1 to 7 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Locate the slots to install an additional (redundant) fan unit.  
16x 2.5-inch Drive Model: Install redundant fan units to slots FAN 2F to 5F.  
26x 2.5-inch Drive Model / 3.5-inch Drive Model: Install redundant fan units to slots FAN 1F to 5F.
3. Insert fan unit straight into the slot for additional fan unit.  
When the fan unit is inserted to the end, it is locked with clicking sound.



### 1.13.2 Replacement / Removal

To remove redundant fan unit, reverse the installation procedure.

The fan units are hot-swappable even while the system is powered-on and running.

You can identify the failing fan unit by using the management tool such as EXPRESSSCOPE Engine 3.

While the system is powered-on or running, the LED of failed fan unit is lit.

#### 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*.

- Pay attention to electric hazard.



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## 1.14 Backup Device

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16x 2.5-inch Drive Model supports a magnetic tape drive and other backup devices.

**Important**

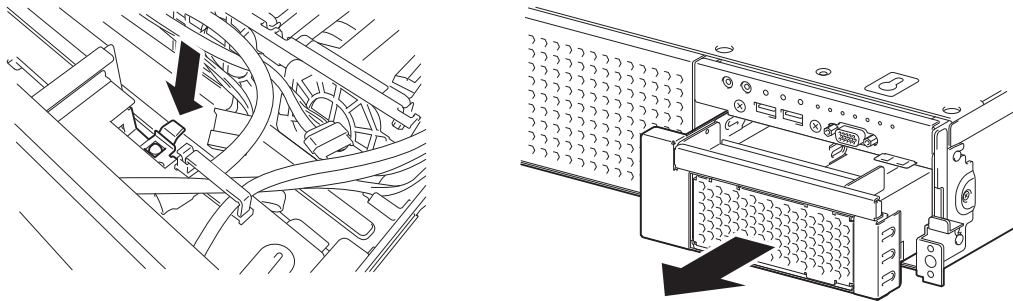
- Use only the backup device specified by NEC.
- Available unit size is 3.5 inch (about 9 cm) in width, 1.6 inch (about 4 cm) in height.

### 1.14.1 Installation

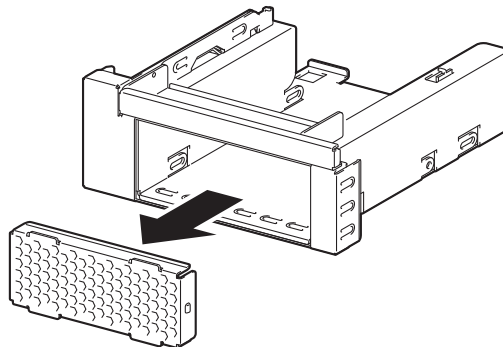
---

Follow the steps below to install the backup device.

1. See steps 1 to 8 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Push the lever to unlatch the expansion bay, and remove the bracket toward the front of chassis.

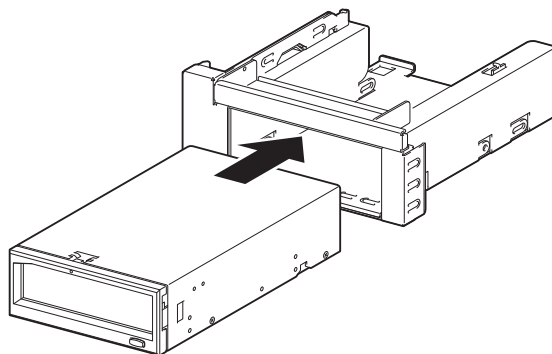


3. Push the blank cover to remove it.

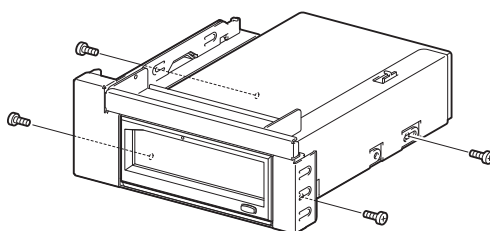
**Important**

Keep the removed blank cover for future use.

4. Insert the backup device into the bracket.



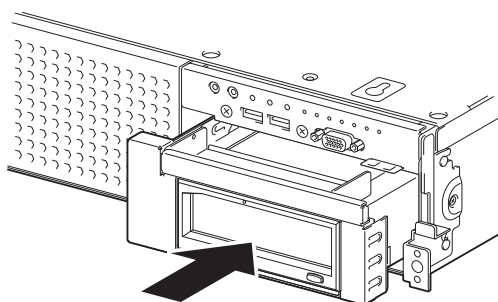
5. Secure the backup device with the four screws that come with the server.



**Important**

- Be sure to use the screws that come with your server.
- Adjust the mounting position of backup file unit so that their screw holes are aligned with those on the bracket.
- If you feel difficult to connect a cable because the depth of backup device is too long, move the device toward front, then connect the cable.

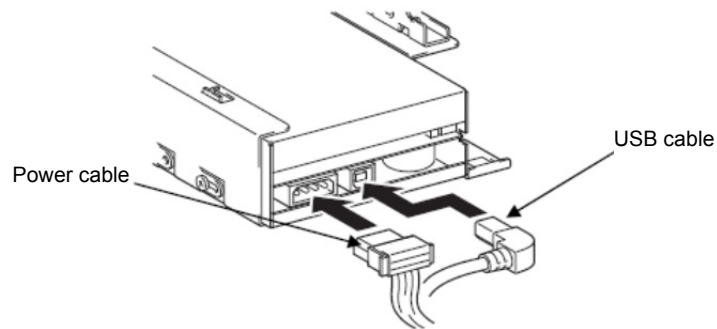
6. Insert the device with bracket into expansion bay.  
When the device is completely inserted, it is locked with clicking sound.



**Note**

Pay attention not to pinch the cable when inserting the device.

7. Connect an interface cable and power cable.

**Note**

Use the power cable that extends to the expansion bay of the server.  
If it is too short to connect, use the extension cable that comes with the backup device.  
Use K410-353(00) Internal USB Cable for the USB cable.  
If the USB cable comes in contact with the cooling fan unit, fix the cable using the cable clamp on the expansion bay side.

8. Continue to install or remove internal optional devices, mount and connect the server, and power on the server.

**Important**

When N8151-125 Internal RDX (USB) is connected, the boot device priority may be changed. On the Boot menu of BIOS Setup Utility, specify the boot priority of removable device lower than that of boot device.

9. Make sure that no error messages are displayed on POST screen.

For details on POST error messages, see *Chapter 3 (1. POST Error Message)* in "Maintenance Guide".

10. Install the driver for backup device as needed.

### 1.14.2 Removal

Remove the backup device in reverse order of installation steps.

## 1.15 PCI Card

This server provides five PCI slots that can contain PCI card.

**Important** You must avoid static electricity to work with the procedure below. For details, see *Chapter 2 (1.2 Anti-static Measures)*.

### 1.15.1 Notes

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

- Do not touch the terminals 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.
- The type of the connectable PCI card depends on the location of the PCI slot. Check the card type before connecting it to the PCI slot.
- The server provides no connector to connect an LED connector of RAID controller.
- Assigned PCI slot numbers are #1, #2, #3, #4, and #5 from left to right when viewed from the rear . If only one processor is installed, PCI slot #1 is unavailable.
- The search order for PCI bus slot on boot is as follows.  
PCI#3 → PCI#2 → PCI#4 → PCI#5 → PCI#1
- Bus number, device number and function number of PCI devices are as follows:

PCI device	Bus number	Device number	Function number
Slot 1	82h	0	X
Slot 2	20h	0	X
Slot 3	01h	0	X
Slot 4	40h	0	X
Slot 5	68h	0	X

- If an additional LAN card is installed, it is hard to push the catch of the connector with your finger that is connected to the LAN card. Disconnect the connector pushing the catch with a standard screwdriver. At this time, be very careful for the screwdriver not to damage the LAN card or any other card.
- If a bootable device such as a PCI card or USB device is added, the boot order is changed. In BIOS Setup Utility, select **HDD Priorities** from **Boot** menu and confirm the boot order.  
If an HDD under an optional RAID controller is connected, the boot device is (Bus xx Dev 00) PCI RAID Adapter. Note that the value for xx changes depending on the PCI slot where the RAID controller is installed.
- Enable the option ROM scan of BIOS settings when starting the OS on a RAID controller, LAN card (network booting), or Fibre Channel controller. See *Chapter 2 (1. System BIOS)* in "Maintenance Guide" for how to specify it.

### 1.15.2 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

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

Priority	Product number							Remarks	
		Slot number	PCI #1 (2 CPUs required)	PCI #2	PCI #3	PCI #4	PCI #5		
		PCI standard	PCIe 3.0				PCIe 2.0		
		PCI slot performance	x8 lane	x16 lane	x8 lane	x16 lane	x4 lane		
		Socket type	x8 socket	x16 socket	x8 socket	x16 socket	x8 socket		
		Transfer bandwidth (per lane)	8Gb/s				5Gb/s		
		Slot size	Low Profile						
		Available card size	168mm max.	200mm max.			168mm max.		
Product name									
High ↑	N8103-176	RAID Controller (1GB, RAID 0/1) (PCI Express 3.0(x8))	(4)	(2)	(1)	(3)	—	Dedicated to connecting with internal hard disk drives. Choose one card (N8103-176, N8103-177, or N8103-178).	Flash Backup Unit (N8103-181) can be mounted.
	N8103-177	RAID Controller (1GB, RAID 0/1/5/6) (PCI Express 3.0(x8))	(4)	(2)	(1)	(3)	—		
	N8103-178	RAID Controller (2GB, RAID 0/1/5/6) (PCI Express 3.0(x8))	(4)	(2)	(1)	(3)	—		
	N8103-179	RAID Controller (2GB, RAID 0/1/5/6) (PCI Express 3.0(x8))	(4)	(2)	(1)	(3)	—	For connecting with external devices; Up to 2 cards can be mounted.	Flash Backup Unit is factory installed.
	N8118-303	2.5-inch PCIe SSD installation kit	—	—	—	(1)	—	For connecting with 2.5-inch internal PCIe SSD (16x2.5-inch drive model)	
	N8118-304	2.5-inch PCIe SSD installation kit	—	—	—	(1)	—	For connecting with 2.5-inch internal PCIe SSD (26x2.5-inch drive model)	
	N8190-158A	Fibre Channel Controller (2ch) (16Gbps/Optical) (PCI Express 3.0(x8))	(4)	(2)	(1)	(3)	—	For connecting with external Fibre Channel devices	When the server installing Xeon E5-2603v4 is used in 1-CPU configuration, up to two port can be used.
	N8190-157A	Fibre Channel Controller (1ch) (16Gbps/Optical) (PCI Express 3.0(x8))	(4)	(2)	(1)	(3)	—	For connecting with external Fibre Channel devices	When the server installing Xeon E5-2603v4 is used in 2-CPU configuration, up to six port can be used.
	N8104-147	InfiniBand Adapter (2ch) (FDR/Optical) (PCI Express 3.0(x8))	(4)	(2)	(1)	(3)	—	For Infiniband connection Up to two cards can be mounted.	Cannot be mounted mixedly.
	N8104-146	InfiniBand Adapter (1ch) (FDR/Optical) (PCI Express 3.0(x8))	(4)	(2)	(1)	(3)	—	For Infiniband connection Up to two cards can be mounted.	
	N8104-157	10GBASE-T Adapter(2ch) (PCI Express 3.0(x4))	(4)	(2)	(1)	(3)	—	For additional LAN port.	
	N8103-184	SAS Controller (PCI Express 3.0(x8))	(4)	(2)	(1)	(3)	—	For connecting with external devices	Up to three cards including N8103-184 and N8103-142 can be mounted
N8190-160	Fibre Channel Controller (2ch) (8Gbps/Optical) (PCI Express 2.0(x8))	(4)	(2)	(1)	(3)	—	For connecting with external Fibre Channel devices		
N8190-159	Fibre Channel Controller (8Gbps/Optical) (PCI Express 2.0(x8))	(4)	(2)	(1)	(3)	—	For connecting with external Fibre Channel devices		
Low									

Priority	Product number							Remarks	
		Slot number	PCI #1 (2 CPUs required)	PCI #2	PCI #3	PCI #4	PCI #5		
		PCI standard	PCIe 3.0				PCIe 2.0		
		PCI slot performance	x8 lane	x16 lane	x8 lane	x16 lane	x4 lane		
		Socket type	x8 socket	x16 socket	x8 socket	x16 socket	x8 socket		
		Transfer bandwidth (per lane)	8Gb/s				5Gb/s		
		Slot size	Low Profile						
	Available card size	168mm max.	200mm max.			168mm max.			
Product name									
High ↑         Low	N8104-153	10GBASE-T Adapter (2ch) (PCI Express 2.0(x8))	(4)	(2)	(1)	(3)	(5)	For additional LAN port.	Up to three N8104-149, N8104-153 and N8104-157 cards can be mounted in total in 1-CPU configuration.*1 Up to five N8104-149, N8104-153 and N8104-157 cards can be mounted in total in 2-CPU configuration.*1
	N8104-149	10GBASE Adapter (SFP+/2ch) (PCI Express 2.0(x8))	(4)	(2)	(1)	(3)	(5)	For additional LAN port. Prepare SFP+module N8104-129 if needed.	
	N8103-142	SAS Controller (PCI Express 2.0(x8))	(4)	(2)	(1)	(3)	(5)	For connecting with external devices	N8103-184 and N8103-142 can be mounted up to three cards in total
	N8104-152	1000BASE-T Adapter (4ch) (PCI Express 2.0(x4))	(4)	(2)	(1)	(3)	(5)	For additional LAN port. LAN cable with boots cannot be used.	
	N8104-145	1000BASE-T Adapter (2ch) (PCI Express 2.0(x4))	(4)	(2)	(1)	(3)	(5)	For additional LAN port.	
	N8104-151	1000BASE-T Adapter (2ch) (PCI Express 2.0(x1))	(4)	(2)	(1)	(3)	(5)	For additional LAN port. Card type: PCI Express 2.0 (x4)	
	N8104-150	1000BASE-T Adapter (1ch) (PCI Express 2.0(x1))	(4)	(2)	(1)	(3)	(5)	For additional LAN port. Card type: PCI Express 2.0 (x4)	
	N8117-01A	Additional RS-232C connector	—	—	(1)	(2)	(3)	For additional serial port B (RS-232C). Only one card can be mounted.	

**Note**

PCI cards are listed in order of priority for mounting in slots. Numbers in parentheses indicate the priority of each slot for each card. If "—" is displayed, the card cannot be mounted.

Example: Suppose you want to mount a N8103-176 RAID Controller (1GB, RAID 0/1), N8190-158A Fibre Channel Controller (2ch) (16Gbps/Optical), and N8103-142 SAS Controller. Select the controller to be mounted first based on the card priority, and then select the slot to mount the card based on the slot priority. In this case, the controllers should be mounted in the following order: RAID Controller to #3 (the highest priority), Fiber Channel Controller-#2 (#3 is already used), SAS Controller - #4 (#3 and #2 are already used)

\*1 Performance of LAN depends on the application and memory capacity. If you want to mount three or more 10G LAN cards, a sufficient verification under your system environment is needed.

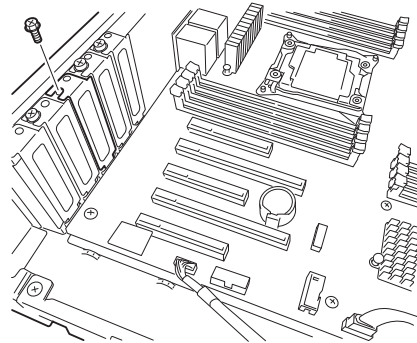
### 1.15.3 Installation

Install a PCI card to a PCI slot in the following procedure.

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

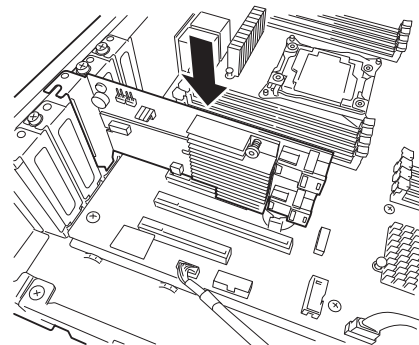
**Note** To install an FBU, see Chapter 2 (1.12 Flash Backup Unit for RAID Controller).

1. See steps 1 to 6 in Chapter 2 (1.3 Overview of Installation and Removal) for preparations.
2. Confirm the slot to install the PCI card according to the table in Chapter 2 (1.15.2 Supported PCI cards and available slots).
3. Remove one screw from the blank cover on the slot in which you are going to mount the PCI card, then remove the blank cover.



**Note** Keep the removed blank cover for future use.

4. Position the terminal part of the PCI card to the PCI slot and insert it.

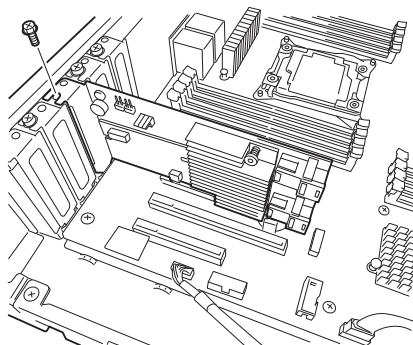


**Important** Do not touch the connector of PCI slot or the terminal part of PCI cards and the signal pins of electric parts installed on the board. Installing boards with dirt or oil can cause malfunction.

**Note**

- 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 board, remove the board once and try again. If you apply excessive pressure on the board, a PCI card or PCI connector might break.

5. Secure the PCI card with the screw removed in Step 4.



6. Continue to install or remove internal optional devices, mount and connect the server, and turn it on.
7. Make sure that no error messages are displayed on POST screen.  
For details on POST error messages, see *Chapter 3 (1. POST Error Message)* in "Maintenance Guide".
8. Run the configuration utility of the card to set up the board as needed.  
For details, see the manual that comes with the card. **If a PCI card including RAID controller, SAS controller, and LAN adapter which connects to any bootable device is added, the boot priority might be changed to the default setting.** In that case, configure the boot priority in **Boot** menu of BIOS Setup Utility. For details, see *Chapter 3 (2. BIOS Setup Utility (SETUP))*.

#### 1.15.4 Removal

To remove a PCI card, reverse the installation procedure.

Run SETUP and change boot order in **Boot** menu as needed. See *Chapter 3 (2. BIOS Setup Utility (SETUP))* for how to specify it.

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

#### 1.15.5 Installing RAID Controller

This section describes how to install an optional RAID Controller to the slot dedicated to RAID Controller.

##### Using the optional RAID controller (N8103-176/177/178/179)

For details, see the manual that comes with optional RAID controller (N8103-176/177/178/179).

##### Important

- You must avoid static electricity to work with the procedure below. For details, see *Chapter 2 (1.2 Anti-static Measures)*.
- Do not change the mode to hibernate while building a RAID system.

##### Note

- Enable **PCI Slot xx ROM** (xx is PCI slot number) of **PCI Configuration** in **Advanced** menu of BIOS Setup Utility.
- Set the boot priority to 8th or higher in the **Boot** menu of the BIOS Setup utility. If the setting is 9th or lower, the configuration menu for RAID controllers cannot be launched.



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## 1.16 Additional 2.5-inch HDD Cage

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This server can have additional 2.5-inch HDD cage for installing additional hard disk drives.

### 1.16.1 Installation

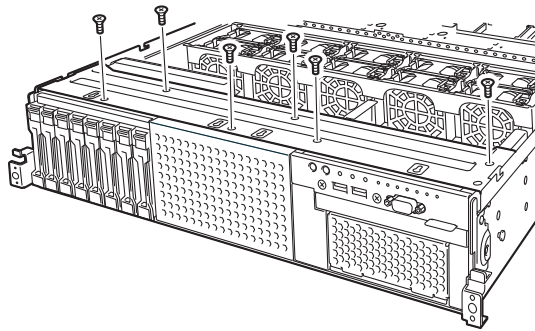
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#### (1) 16x 2.5-inch Drive Model

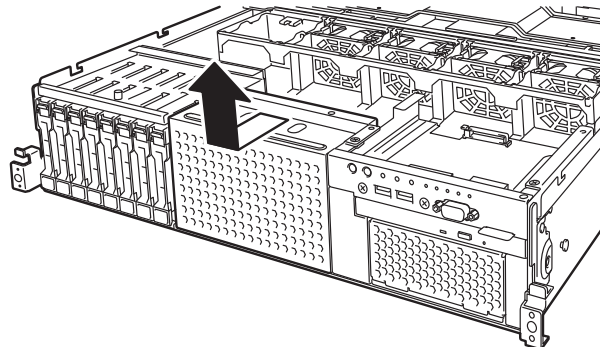
Follow the steps below to install an additional HDD cage.

1. See steps 1 to 8 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.

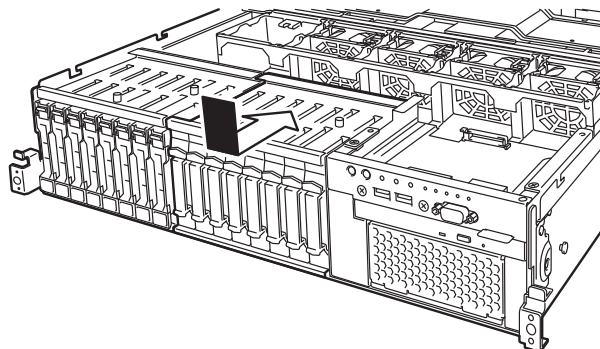
Remove the six screws from protective cover, and remove the protective cover.



2. Remove the blank cover of 2.5-inch HDD cage by pulling it.

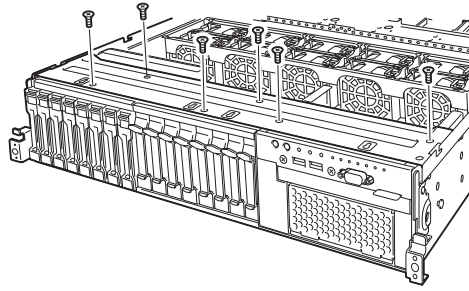


3. Align the projections (4 places) on the chassis with the holes on bottom of 2.5-inch additional HDD cage, and slide the cage toward the rear of the chassis while pushing the cage lightly from top.

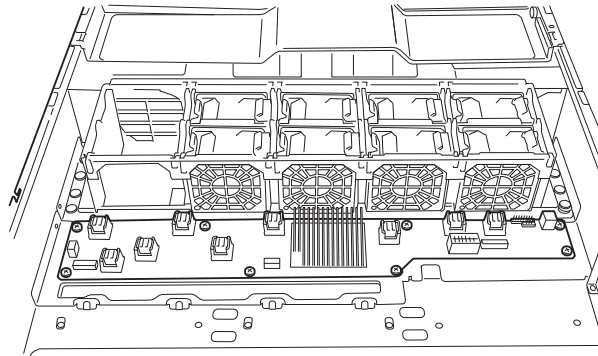
**Note**

Make sure that the turn-up portion of lower part of 2.5-inch additional HDD cage does not get on the metal plate of bottom of the chassis.

4. Secure the protective cover with six screws removed in Step 2.



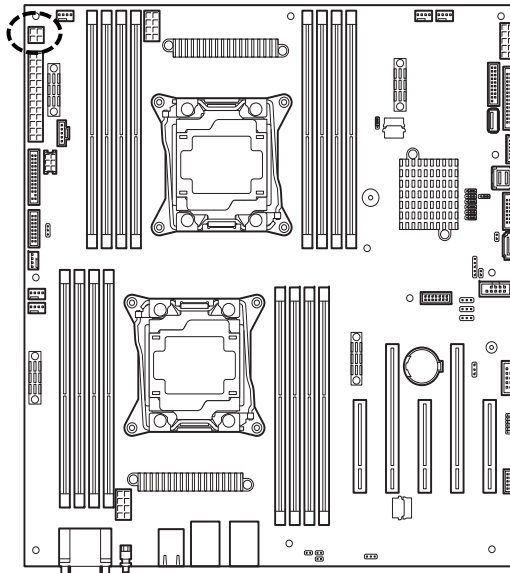
5. Install Expander Card to Expansion Bay and secure it with eight screws provided with 2.5-inch HDD cage.

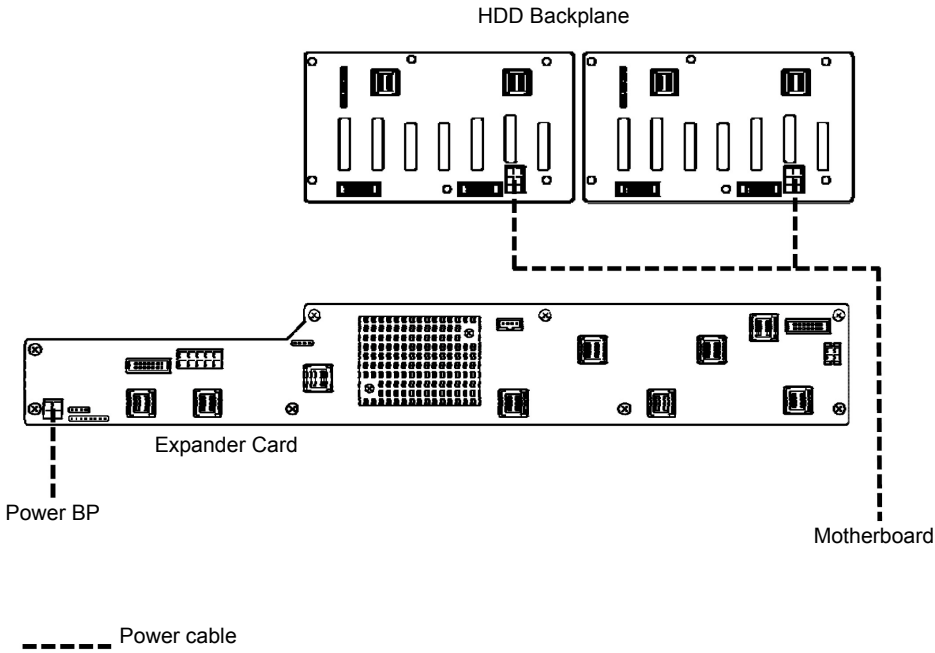


6. Connect the power cable to the HDD cage and the Expander Card. See the figure below.

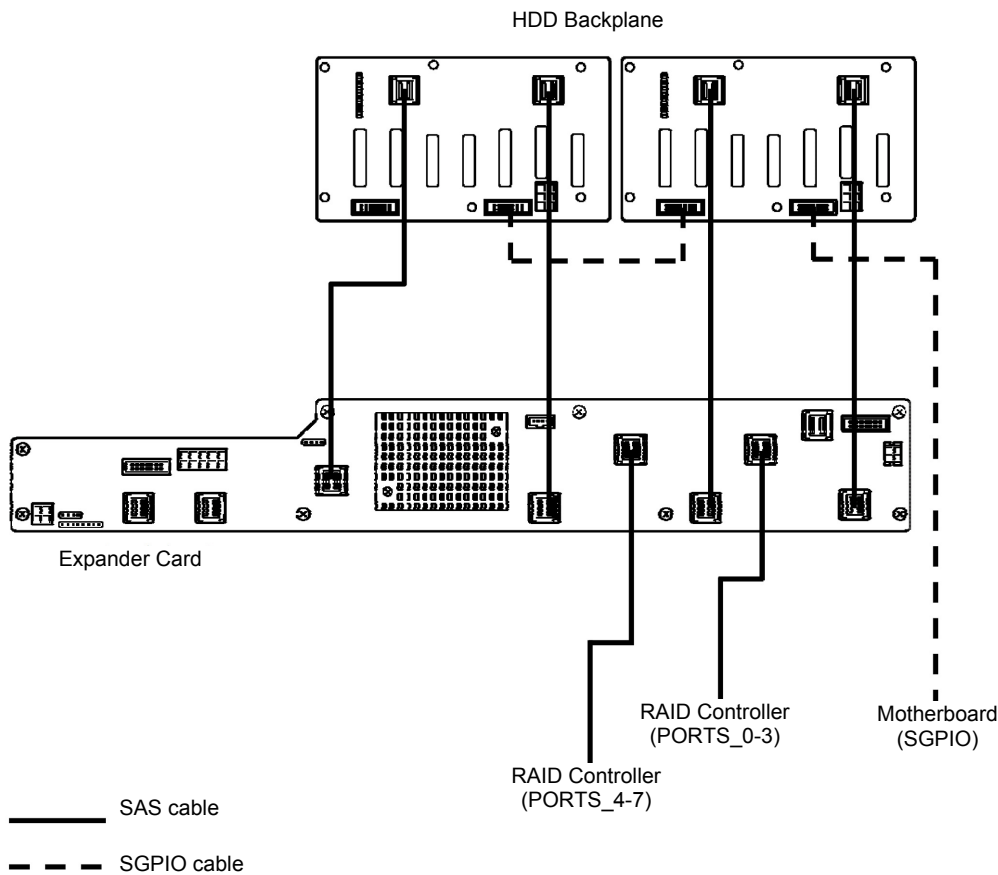
**Tips**

The connector of the power cable connected to the Expander Card is connected to the motherboard at the position shown below. Remove the power cable connector from the motherboard, and then connect it to the Expander Card.

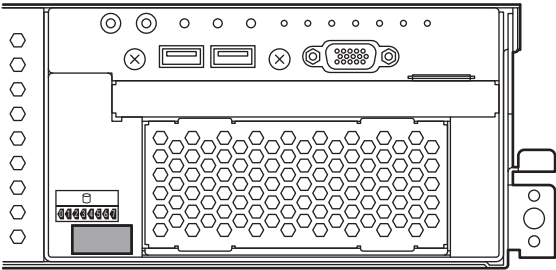




7. Connect the SAS cable and SGPIO cable to the HDD cage and the Expander Card. See the figure below.



8. Install Air Duct, Support Bar, and then install Top Cover.
9. Attach the ID label to the front face of chassis.

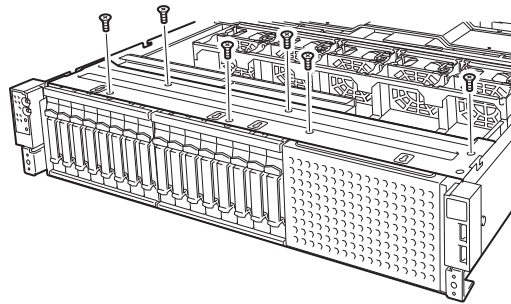


**Note** Keep the removed blank cover for future use.

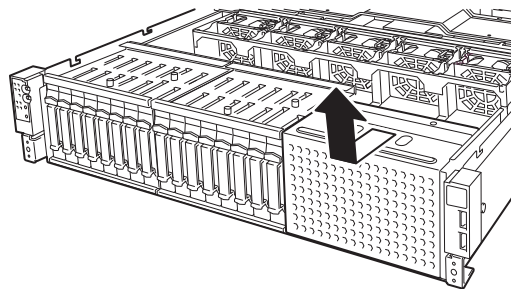
## (2) 26x 2.5-inch Drive Model

Follow the steps below to install an additional HDD cage.

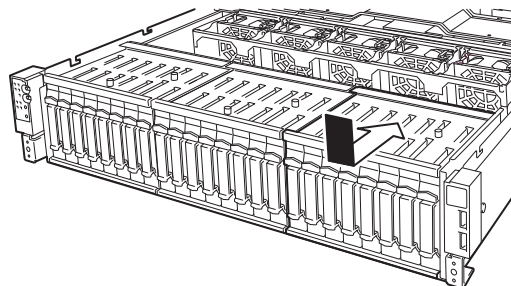
1. See steps 1 to 6 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the six screws from protective cover, and remove the protective cover.



3. Remove the blank cover of 2.5-inch HDD cage by pulling it.



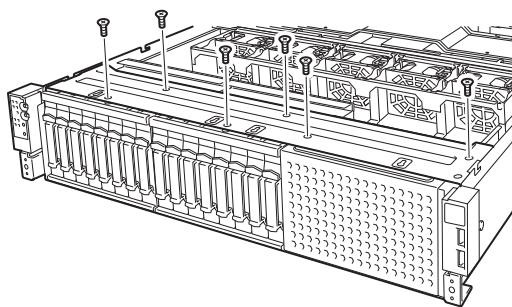
4. Align the projections (4 places) on the chassis with the holes on bottom of 2.5-inch additional HDD cage, and slide the cage toward the rear of the chassis while pushing the cage lightly from top.



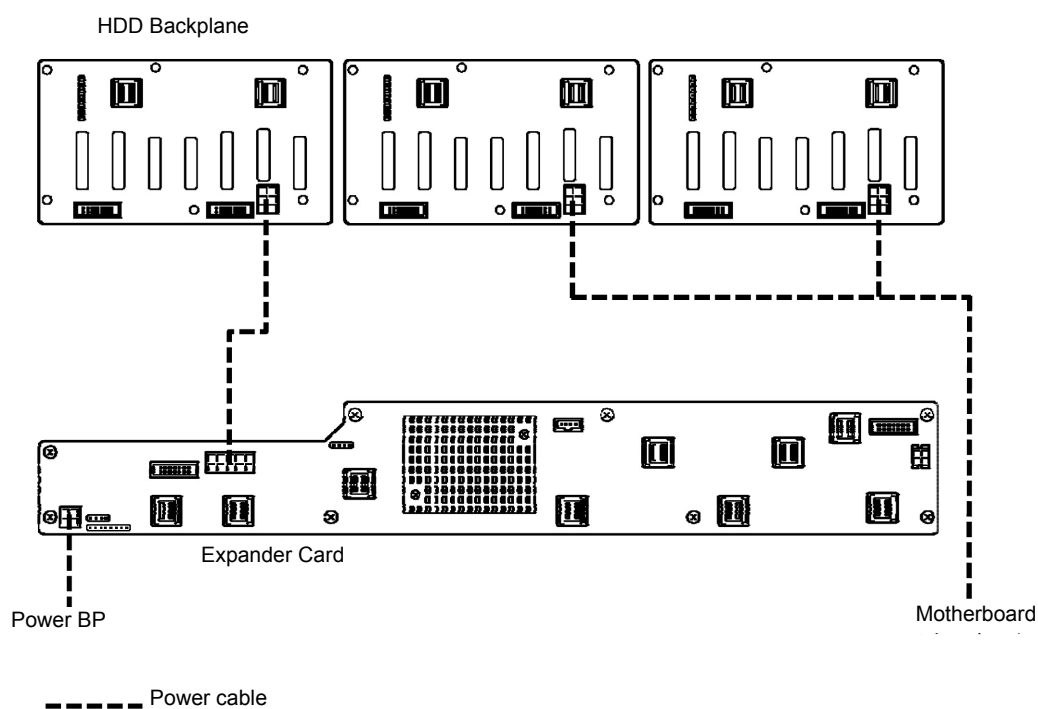
### Note

Make sure that the turn-up portion of lower part of 2.5-inch additional HDD cage does not get on the metal plate of bottom of the chassis.

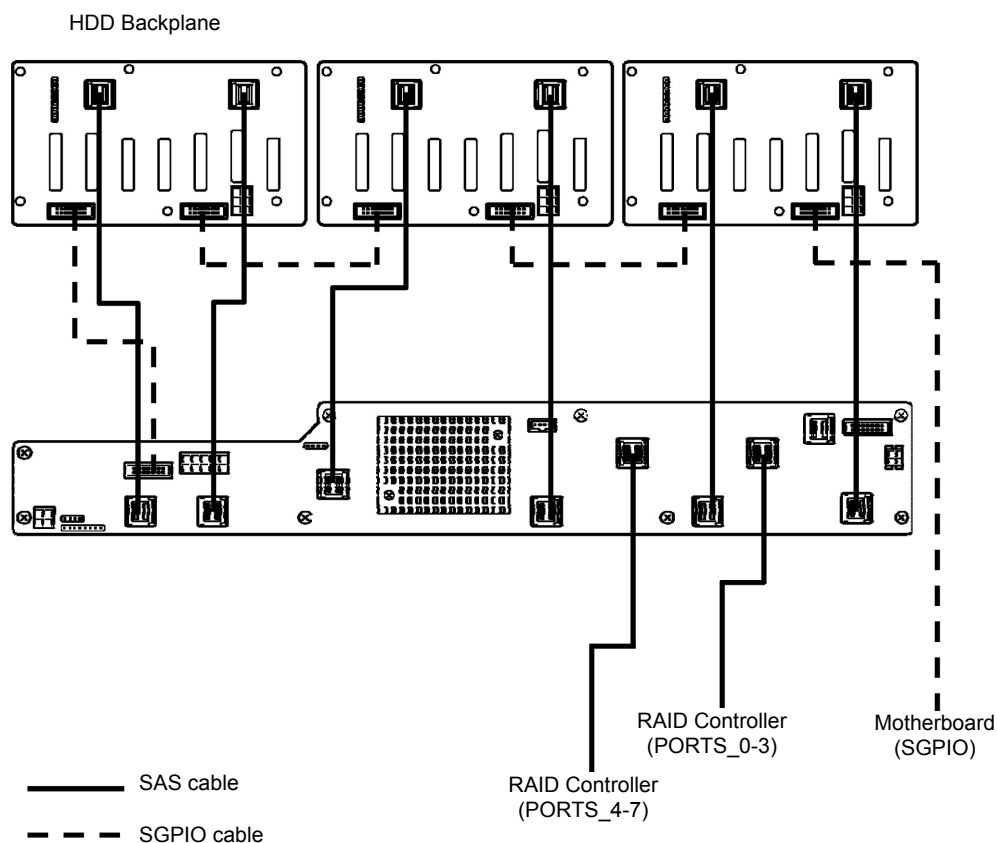
5. Secure the protective cover with six screws removed in Step 2.



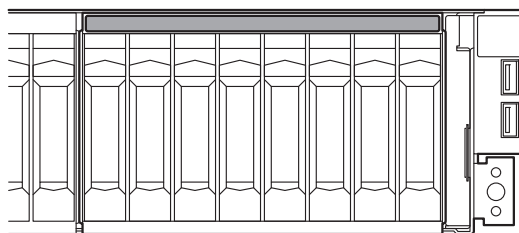
6. Connect the power cable to the HDD cage as shown in the figure below.



7. Connect the SAS cable and SGPIO cable to the HDD cage and the Expander Card. See the figure below.



8. Install Air Duct, Support Bar, and then install Top Cover.
9. Attach the ID label to the 2.5-inch HDD cage.



**Note**

Keep the removed blank cover for future use.

### 1.16.2 Removal

To remove an additional HDD cage, reverse the installation procedure above.

**Important**

To keep the cooling effect in the server, install the blank cover in the vacant slot.

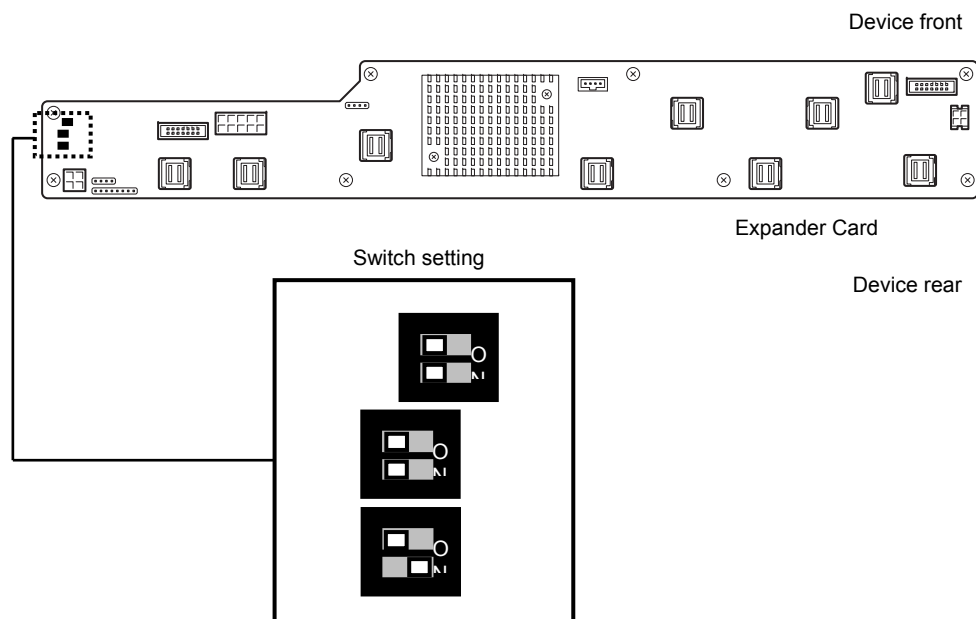
## 1.17 Additional 2.5-inch HDD Cage (Rear)

The server of 26x 2.5-inch Drive Model and 3.5-inch Drive Model can have additional HDD cage (rear) for installing additional hard disk drives.

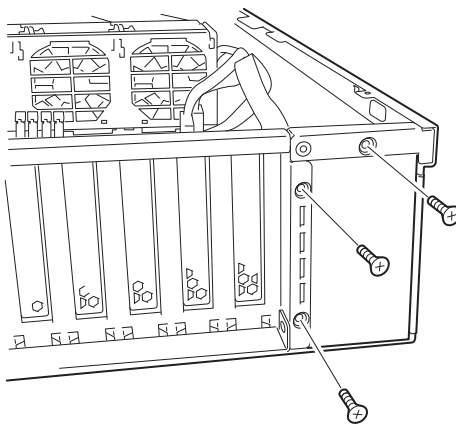
### 1.17.1 Installation

Follow the steps below to install an additional HDD cage.

1. See steps 1 to 6 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. For 26x 2.5-inch Drive Model, see the following figure to confirm the switch settings of the Expander Card. Change the setting if it differs from the setting shown in the following figure.

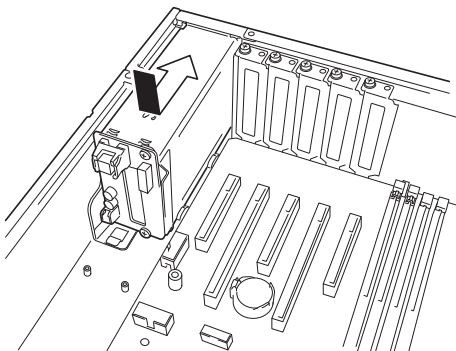


3. Remove the three screws from 2.5-inch additional HDD cage, and remove the blank cover.

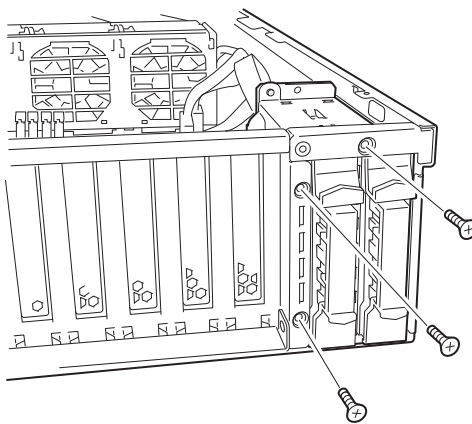




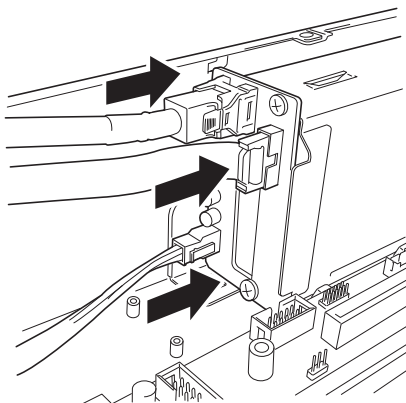
4. Mount the 2.5-inch additional HDD cage by aligning the projection on metal plate, move the cage toward rear of the chassis, and fix it.



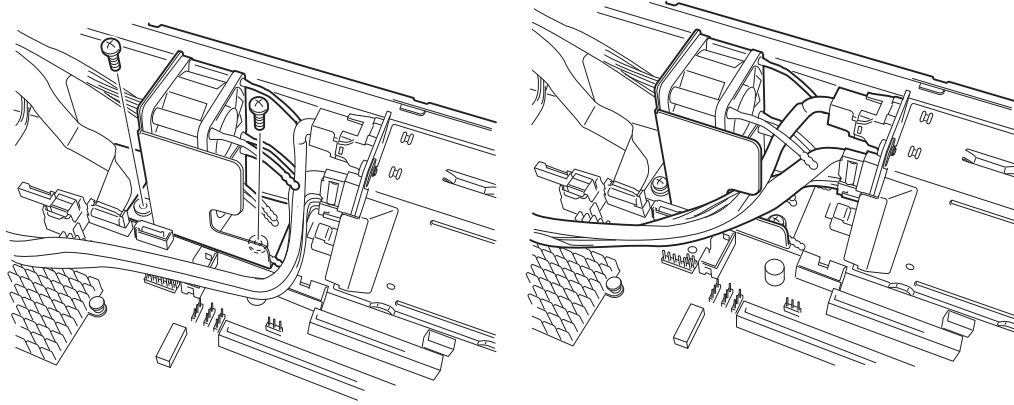
5. Secure the 2.5-inch additional HDD cage with three screws you have removed in Step 2.



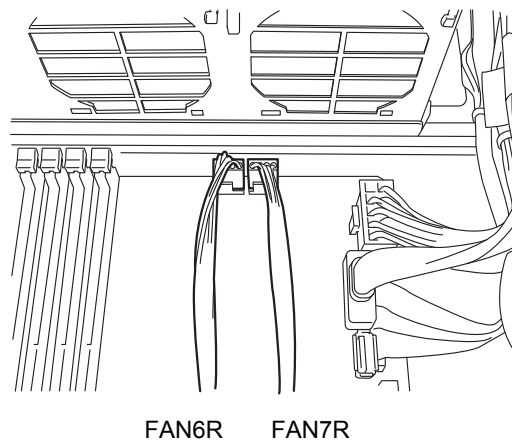
6. Connect the power cable, SAS cable, and LED cable to the 2.5-inch additional HDD cage.



7. Mount the fan cage, and secure it with four screws provided with the fan cage.

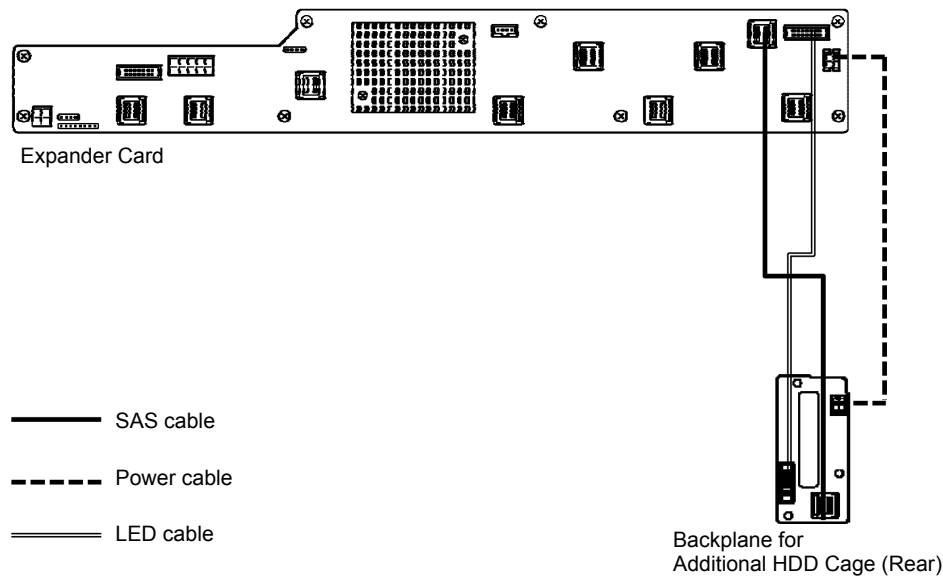


8. Connect the fan unit cable to connectors on motherboard. Connect the lower fan to the connector FAN6R (inscription on MB is FAN2), the upper fan to FAN7R (inscription on MB is FAN1).

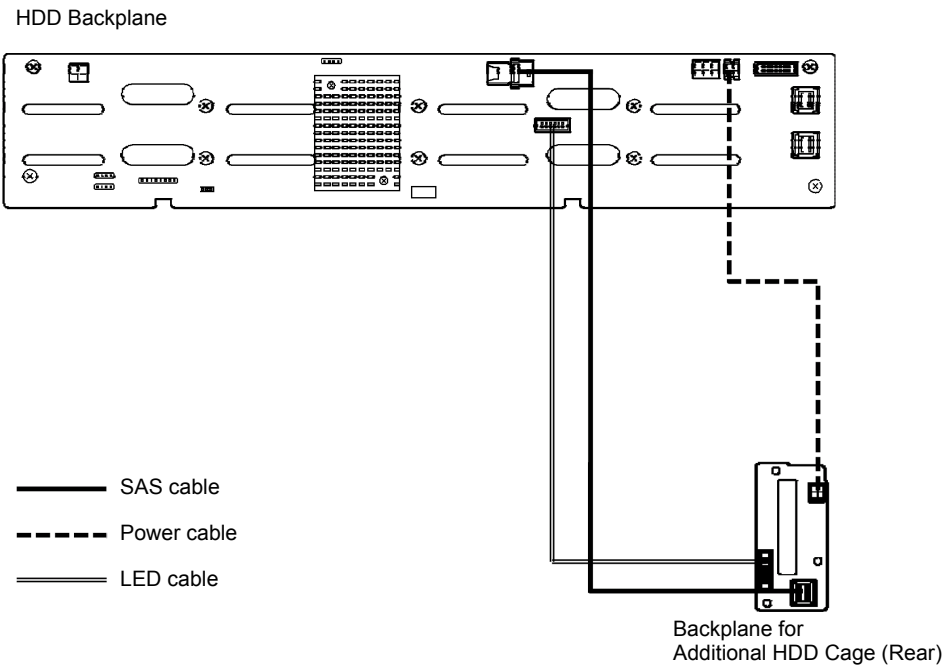


9. Connect the power cable, SAS cable, and LED cable as shown in the figure below.

26x 2.5-inch Drive Model



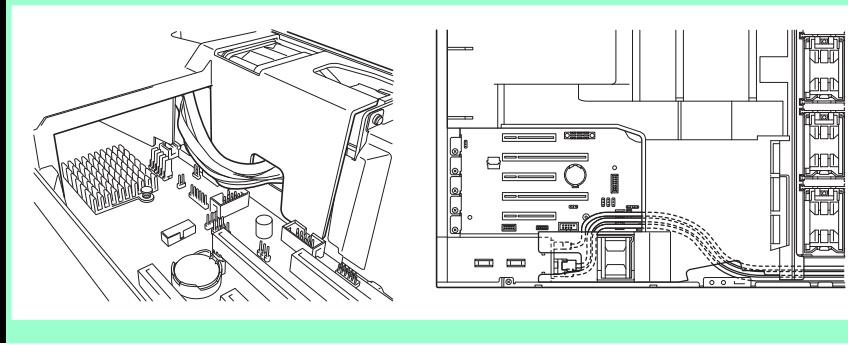
3.5-inch Drive Model



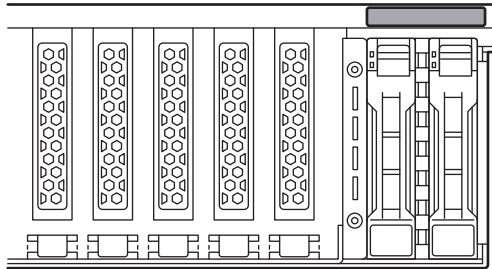
10. Install Air Duct, Support Bar, and then install Top Cover.

**Note**

Route the cable as shown in the figure below to install the Air Duct.



11. Attach the ID label to the Top Cover.

**Note**

Keep the removed blank cover for future use.

### 1.17.2 Removal

To remove an additional HDD cage (Rear), reverse the installation procedure above.

**Important**

To keep the cooling effect in the server, install the blank cover in the vacant slot.

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## 1.18 2.5-inch PCIe SSD Installation Kit

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This server supports 2.5-inch PCIe SSD installation kit that allows installation of additional PCIe SSD.

### 1.18.1 Installation

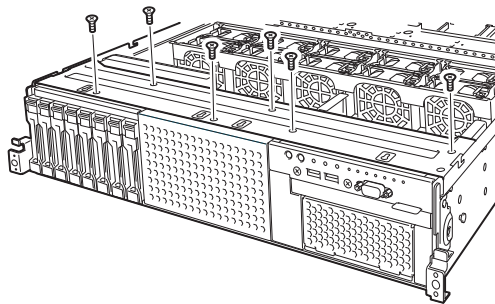
---

#### (1) 16x 2.5-inch Drive Model

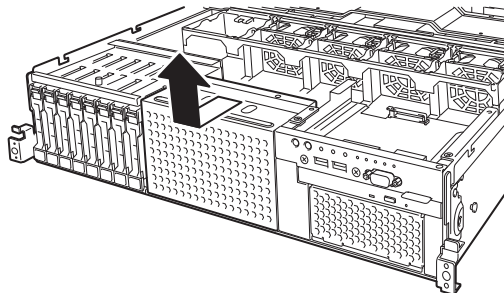
Follow the steps below to install a 2.5-inch PCIe SSD installation kit.

##### (a) Installing 2.5-inch PCIe SSD cage

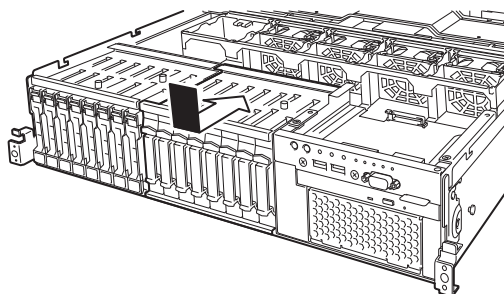
1. See steps 1 to 6 in Chapter 2 (1.3 Overview of Installation and Removal) for preparations. Remove the six screws from protective cover, and remove the protective cover.



2. Remove the blank cover of 2.5-inch additional HDD cage bay by pulling it.



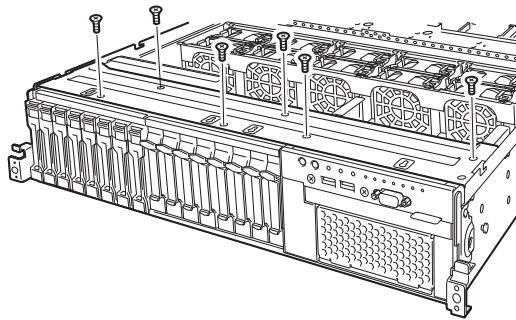
3. Align the projections (4 places) on the chassis with the holes on bottom of 2.5-inch PCIe SSD cage, and slide the cage toward the rear of the chassis while pushing the cage lightly from top.



**Note**

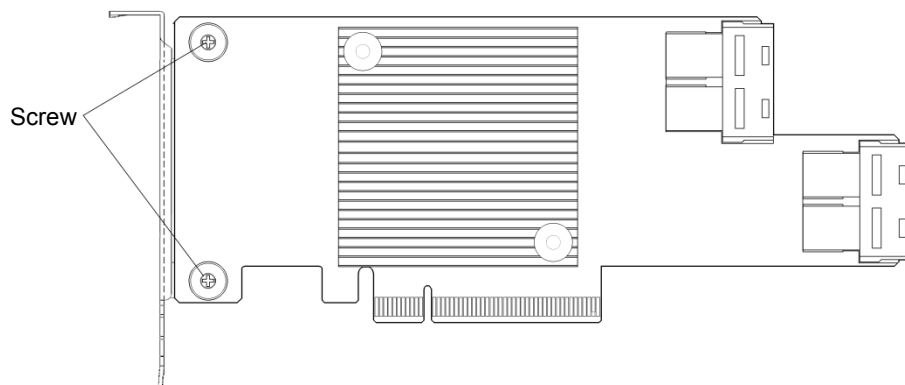
Make sure that the turn-up portion of lower part of 2.5-inch PCIe SSD cage does not get on the metal plate of bottom of the chassis.

4. Secure the protective cover with six screws removed in Step 1.

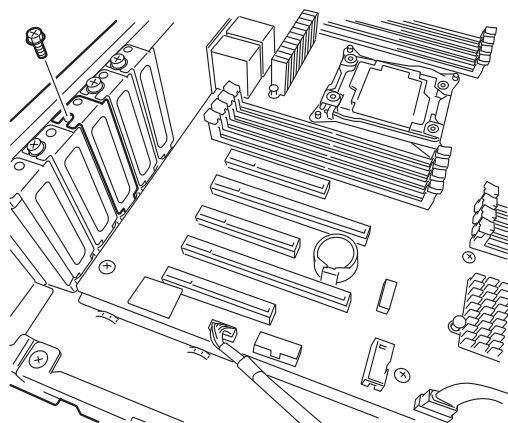


(b) Installing switch card

5. Secure the PCI bracket to the switch card with two screws.

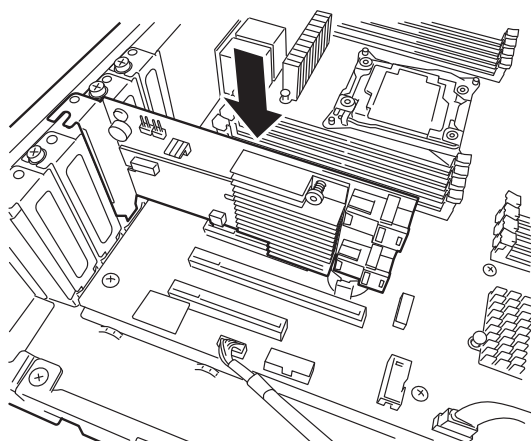


6. Remove the screw that secures the blank cover of PCI slot #4 and remove the blank cover. (The figure shows how to install the PCI card on PCI slot #3. Use the same method to install it on PCI slot #4.)



**Note** Keep the removed blank cover for future use.

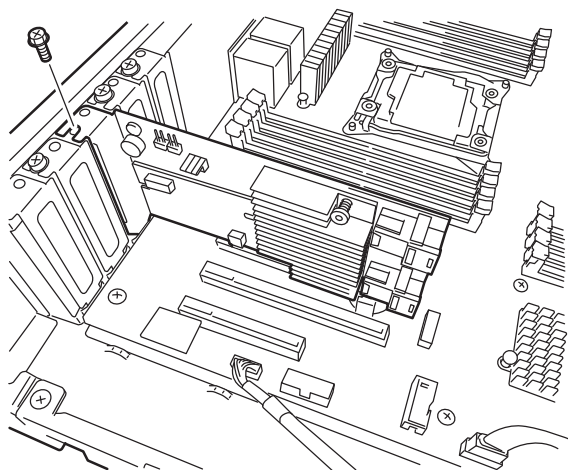
7. Install the switch card on the PCI slot. Align the PCI slot portion and the switch card terminal portion, and then insert the switch card into the slot securely.



**Important** Do not touch the PCI slot connector, switch card terminal portion or signal pins of the electronic parts mounted on the card. Installing a dirty or oily card causes malfunction.

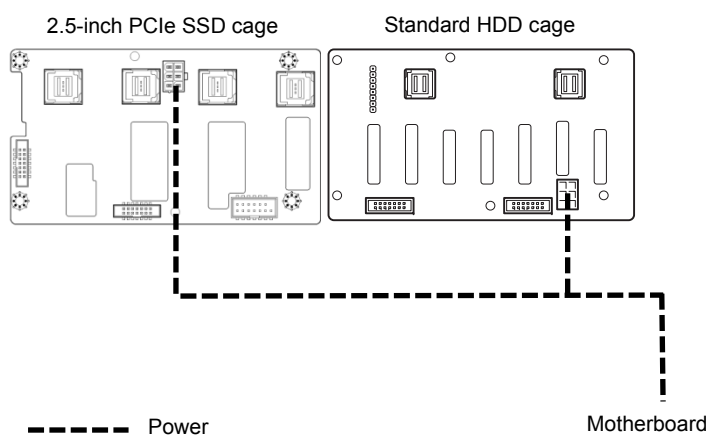
**Note** Make sure that the tip of the switch card bracket is inserted into the securing slot of PCI slot. If the switch card fails to be installed, remove the switch card, and then install it. Applying excess force can damage the switch card and PCI connector.

8. Secure the switch card with the screw removed in Step 6.



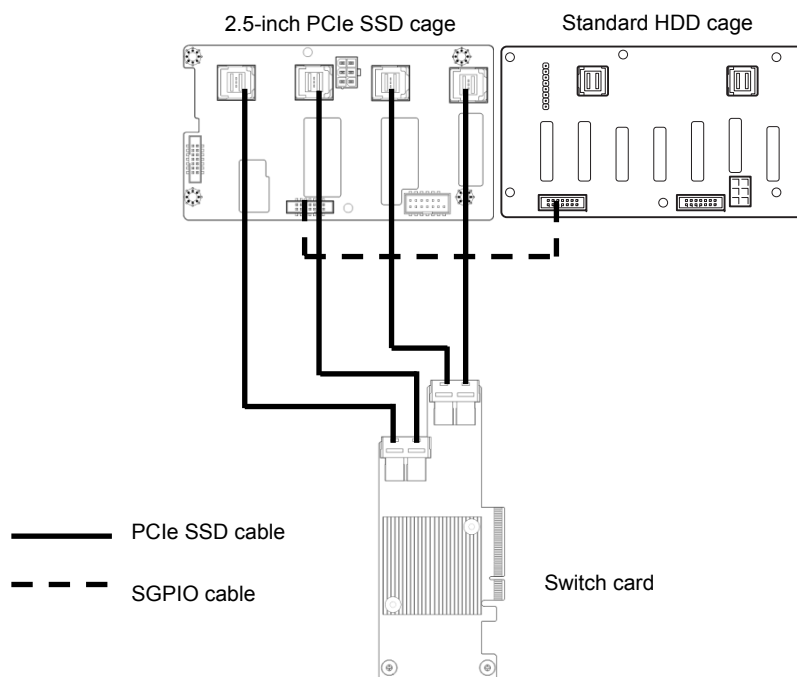
(c) Connecting cables

9. See the figure below to connect the power cable to the 2.5-inch PCIe SSD cage. Replace the power cable connected to the standard HDD cage.

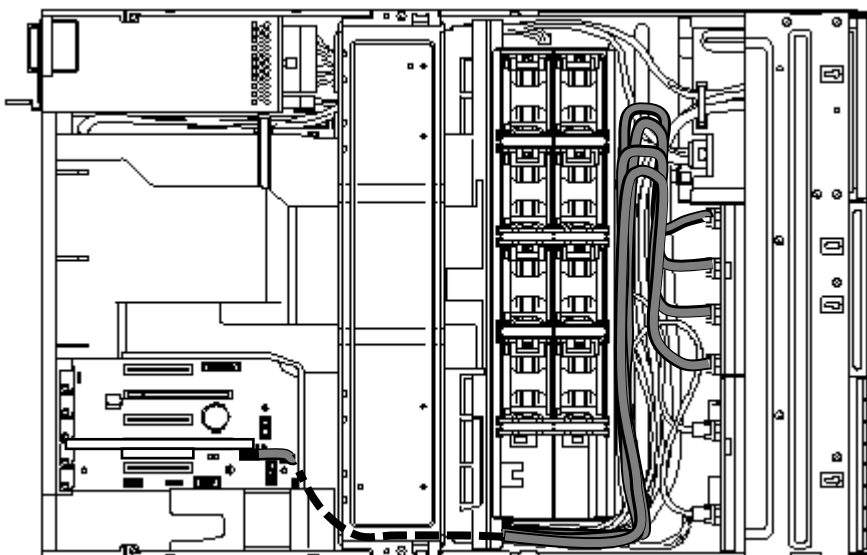




10. See the figure below to connect the PCIe SSD cable and SGPIO cable to the 2.5-inch PCIe SSD cage and PCIe switch card.

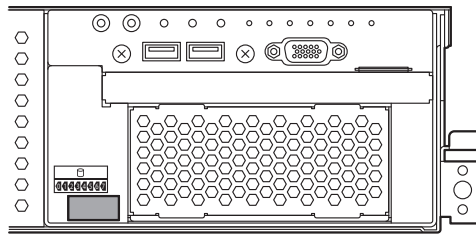


11. Process the excess length of the PCIe SSD cable before the FAN as shown in the figure below.



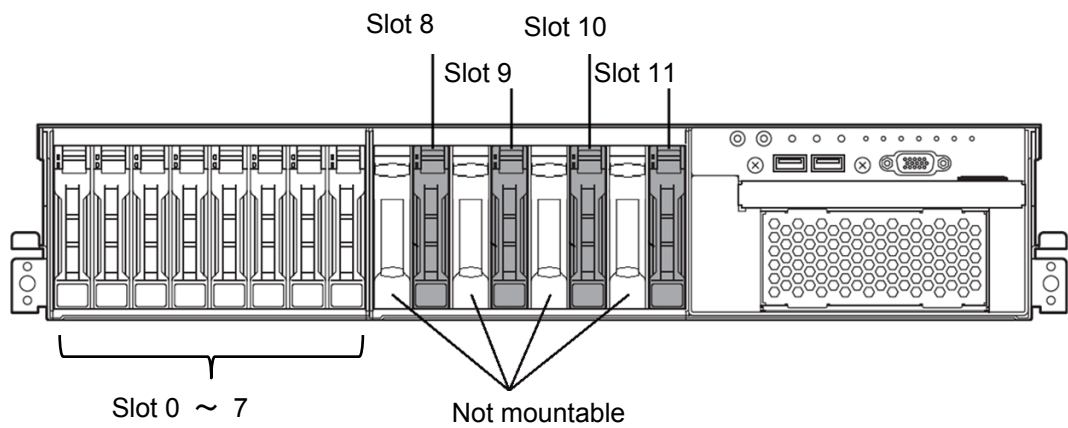
12. Install the air duct and support bar, and then install the top cover.

13. Attach the ID label to the front of the rack.

**Note**

Keep the removed blank cover for future use.

For slot ID and mounting position, see the figure below.

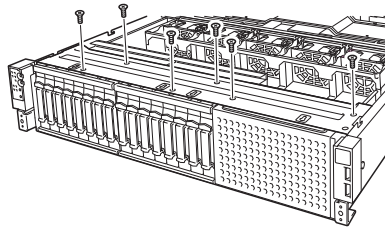


## (2) 26x 2.5-inch Drive Model

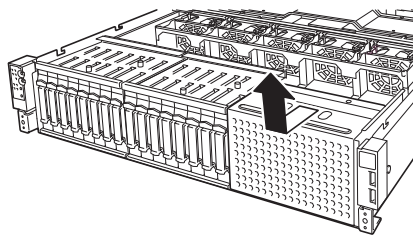
Follow the steps below to install a 2.5-inch PCIe SSD installation kit.

### (a) Installing 2.5-inch PCIe SSD cage

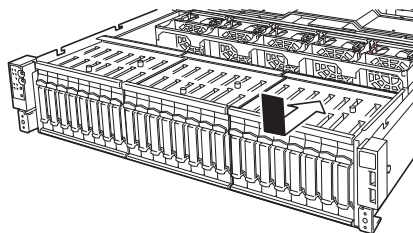
1. See steps 1 to 6 in Chapter 2 (1.3 Overview of Installation and Removal) for preparations. Remove the six screws from protective cover, and remove the protective cover.



2. Remove the blank cover of 2.5-inch additional HDD cage by pulling it.



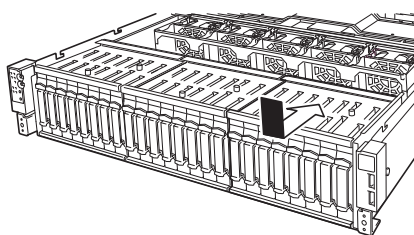
3. Align the projections (4 places) on the chassis with the holes on bottom of 2.5-inch PCIe SSD cage, and slide the cage toward the rear of the chassis while pushing the cage lightly from top.



#### Note

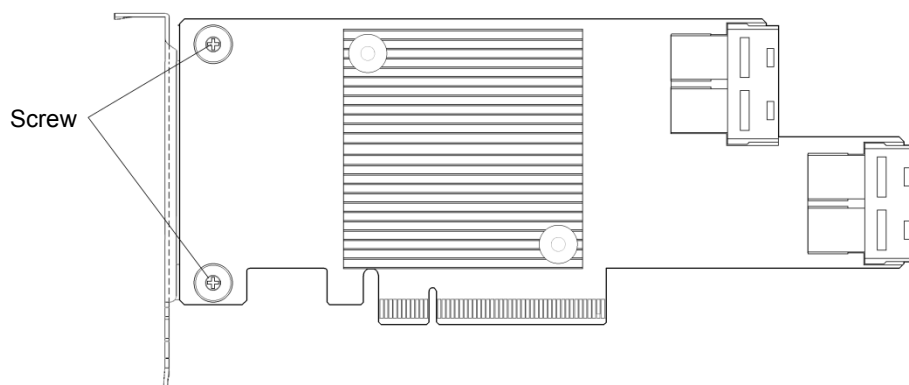
Make sure that the turn-up portion of lower part of 2.5-inch PCIe SSD cage does not get on the metal plate of bottom of the chassis.

4. Secure the protective cover with six screws removed in Step 2.

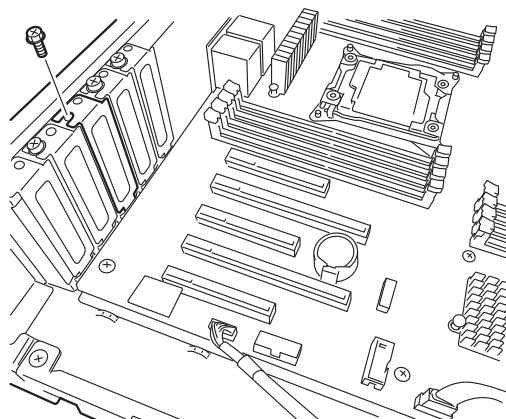


(b) Installing switch card

5. Secure the PCI bracket to the switch card with two screws.



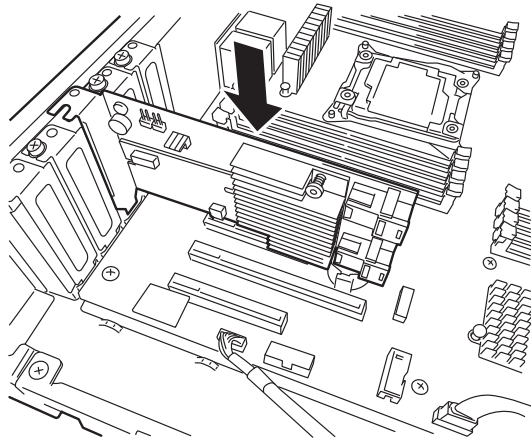
6. Remove the screw that secures the blank cover of PCI slot #4 and remove the blank cover. **(The figure shows how to install the PCI card on PCI slot #3. Use the same method to install it on PCI slot #4.)**



**Note**

Keep the removed blank cover for future use.

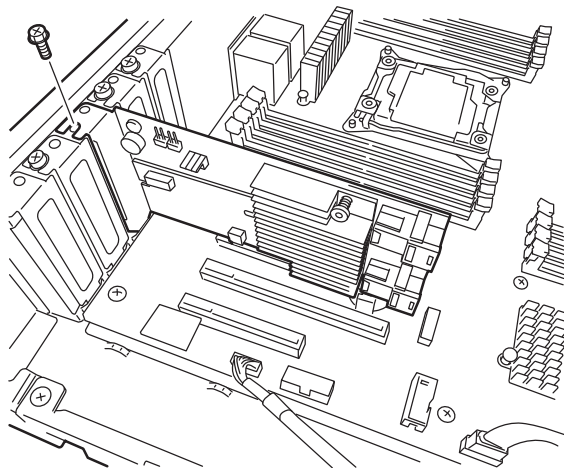
7. Install the switch card on the PCI slot. Align the PCI slot portion and the switch card terminal portion, and then insert the switch card into the slot securely.



**Important** Do not touch the PCI slot connector, switch card terminal portion or signal pins of the electronic parts mounted on the card. Installing a dirty or oily card causes malfunction.

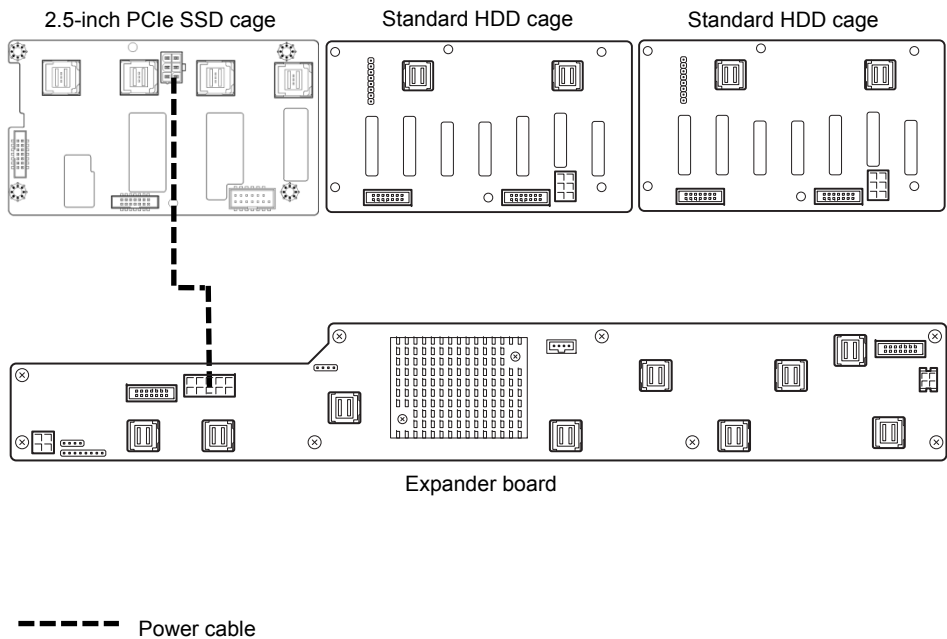
**Note** Make sure that the tip of the switch card bracket is inserted into the securing slot of PCI slot. If the switch card fails to be installed, remove the switch card, and then install it. Applying excess force can damage the switch card and PCI connector.

Secure the switch card with the screw removed in Step 6.

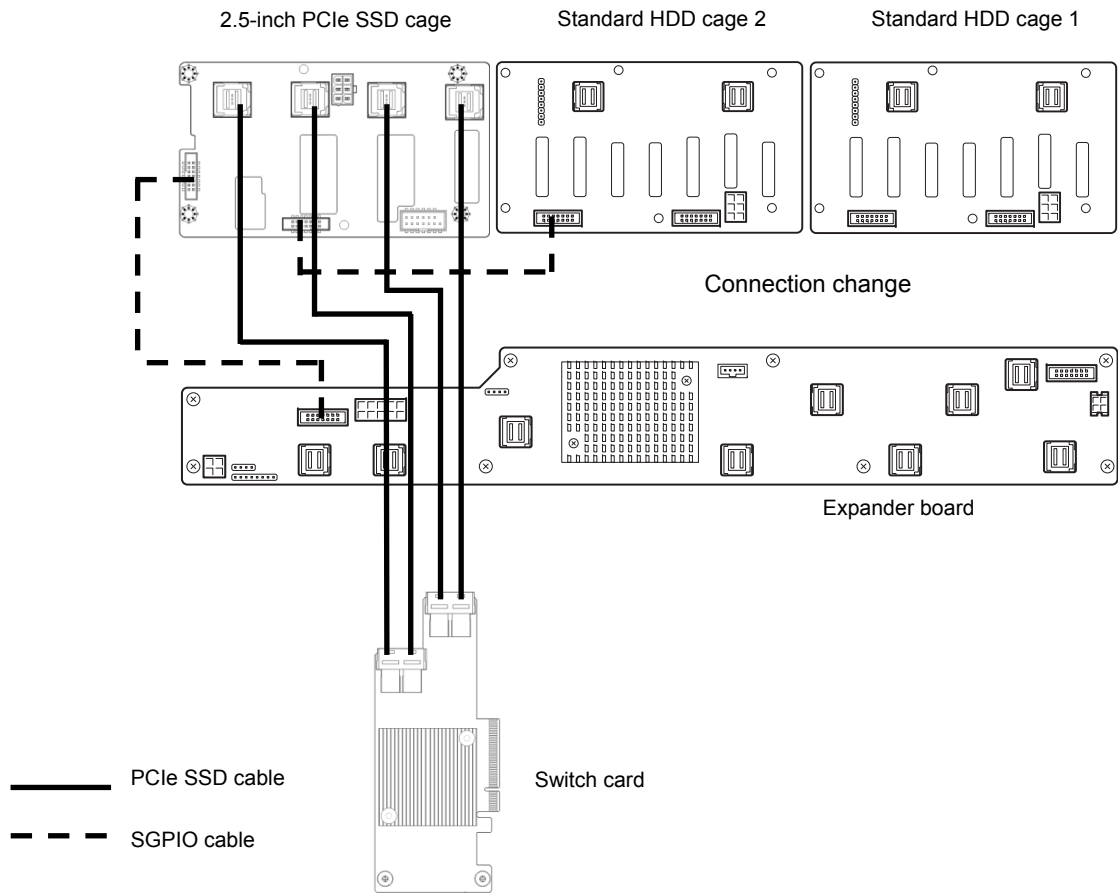


(c) Connecting cables

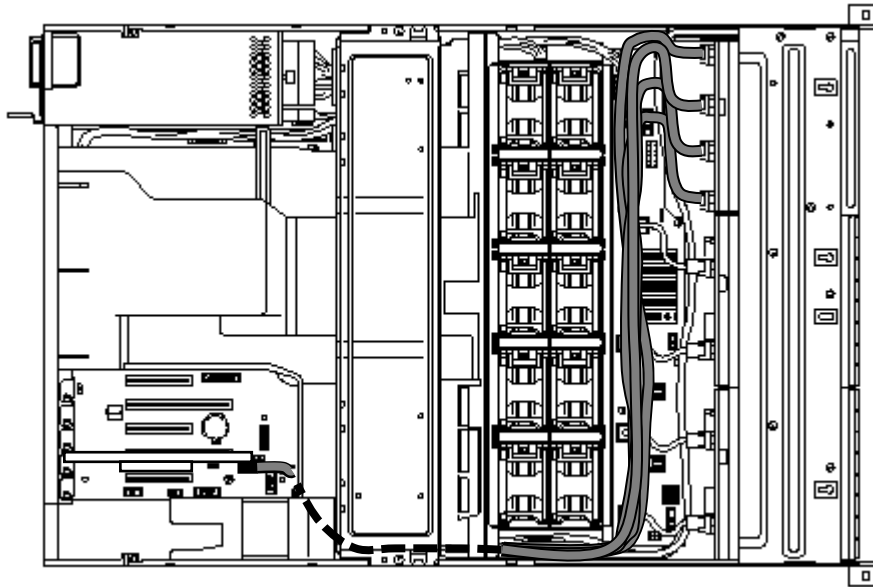
8. See the figure below to connect the power cable to the 2.5-inch PCIe SSD cage.



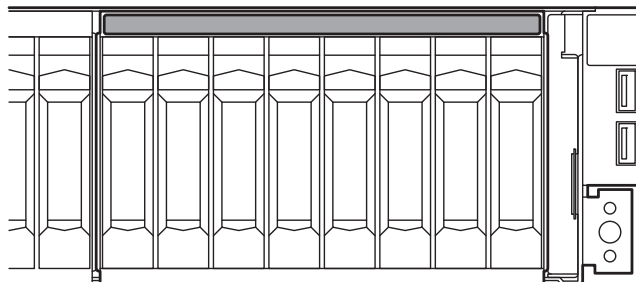
9. See the figure below to connect the PCIe SSD cable and SGPIO cable to the 2.5-inch PCIe SSD cage and PCIe switch card.



10. Process the excess length of the PCIe SSD cable before the FAN as shown in the figure below.

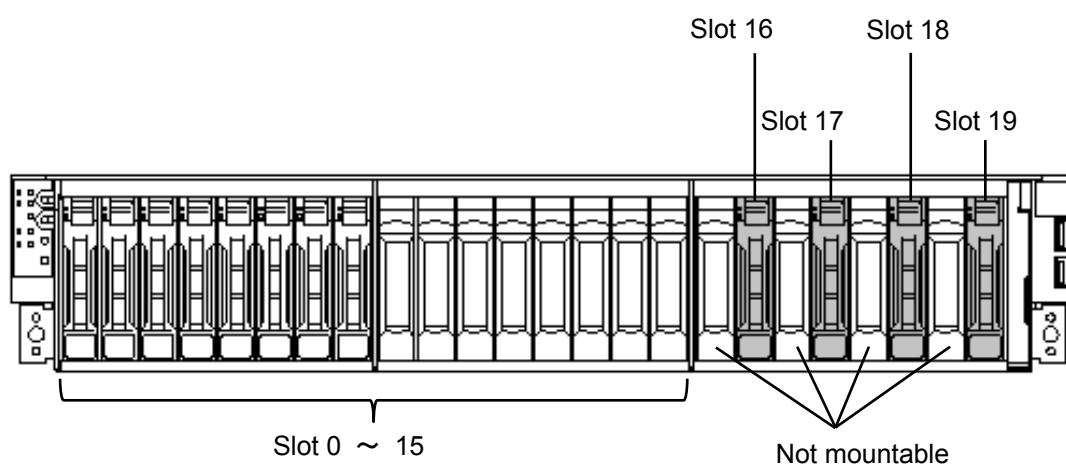


11. Install the air duct and support bar , and then install the top cover.
12. Attach the ID label to the front of the rack.

**Note**

Keep the removed blank cover for future use.

For slot ID and mounting position, see the figure below.

**Note**

Keep the removed blank cover for future use.

### 1.18.2 Removal

To remove the 2.5-inch additional HDD cage, reverse the installation procedure.

**Important**

Install the blank cover in order to retain cooling effect.



## 1.19 Optical Disk Drive

The 16x 2.5-inch Drive Model supports optical disk drive (option).

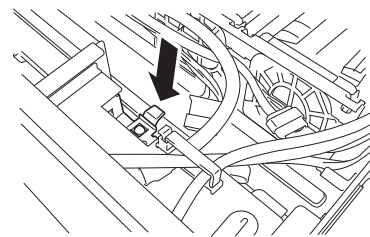
This section describes the procedure for installing the optional optical disk drive.

**Important** Do not install any unsupported optical disk drive.

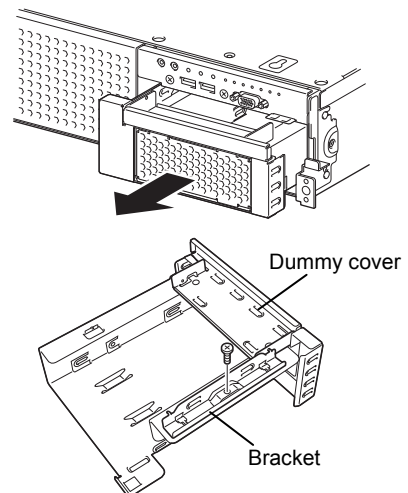
### 1.19.1 Installation

Install an optical disk drive in the following procedure.

1. See steps 1 to 6 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Push the lock on optical disk drive to unlatch it, and pull the tray out.

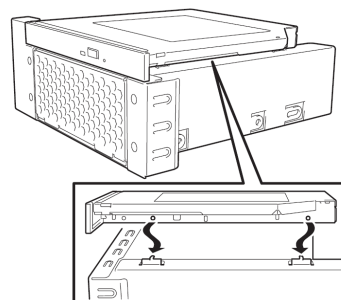


3. Remove one screw from the tray removed in Step 2, and remove the bracket and dummy cover.

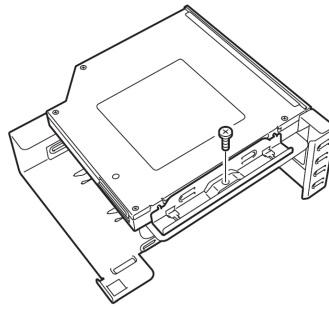


**Note** Keep the removed screws and dummy cover for future use.

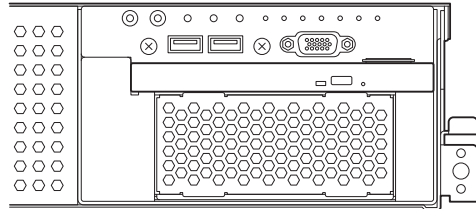
4. Install the optical disk drive to the tray.



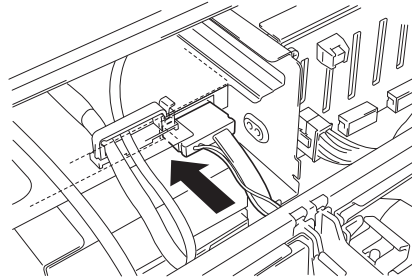
5. Secure the bracket to optical disk drive with one screw.



6. Insert the optical disk drive and secure the drive tray.



7. Connect a cable to the optical disk drive.



### ***1.19.2* Removal**

To remove an optical disk drive, reverse the installation procedure above.

---

## ***1.20*** 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 back up 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**

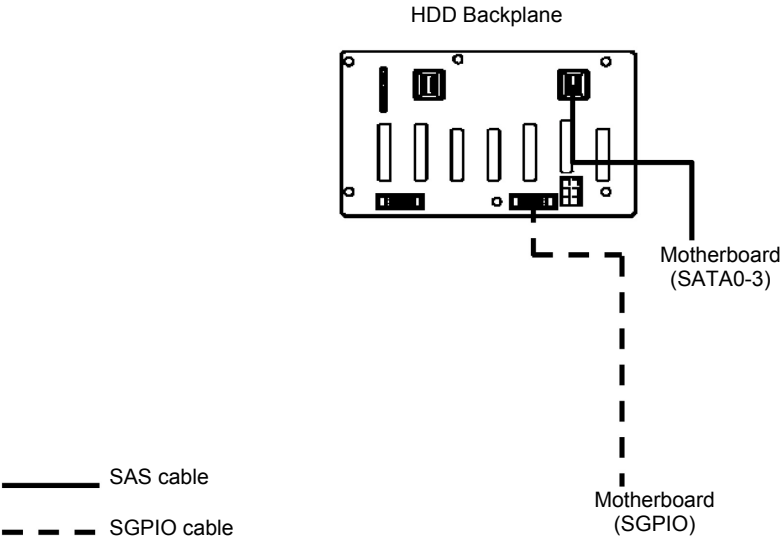
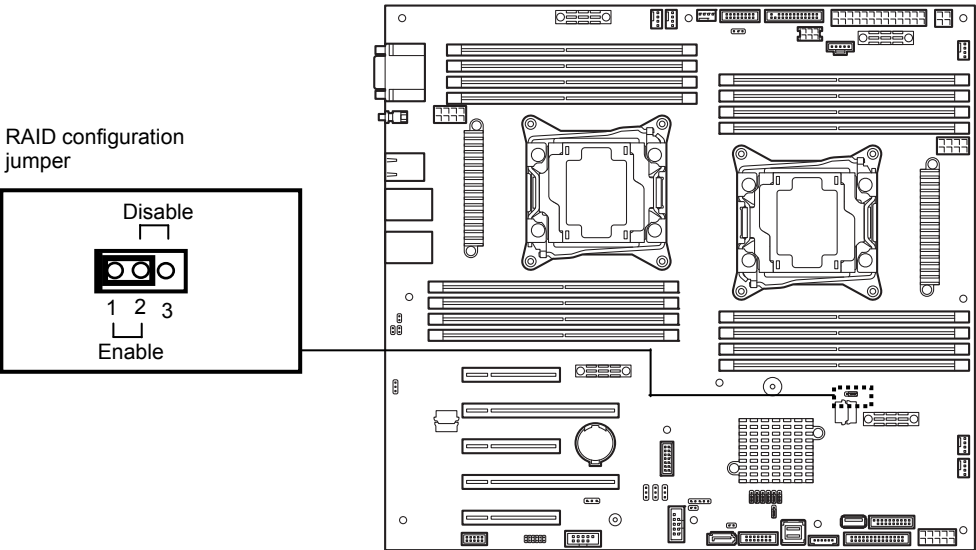
- Logical drives can be created even with only one physical device.
- When using SAS hard disk drive, SAS SSD, or SATA SSD, it must be connected to RAID controller.

1.20.1 Connecting cables

See the figures below for how to connect cables.

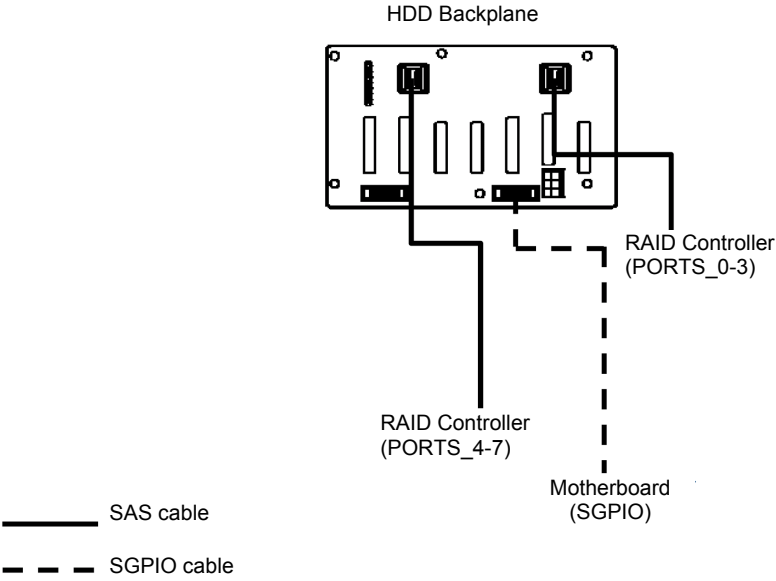
Using the on-board RAID controller (SW RAID) in 16x 2.5-inch drive models (1 to 4 HDDs)

See the figure to switch the RAID configuration jumper to Enable.



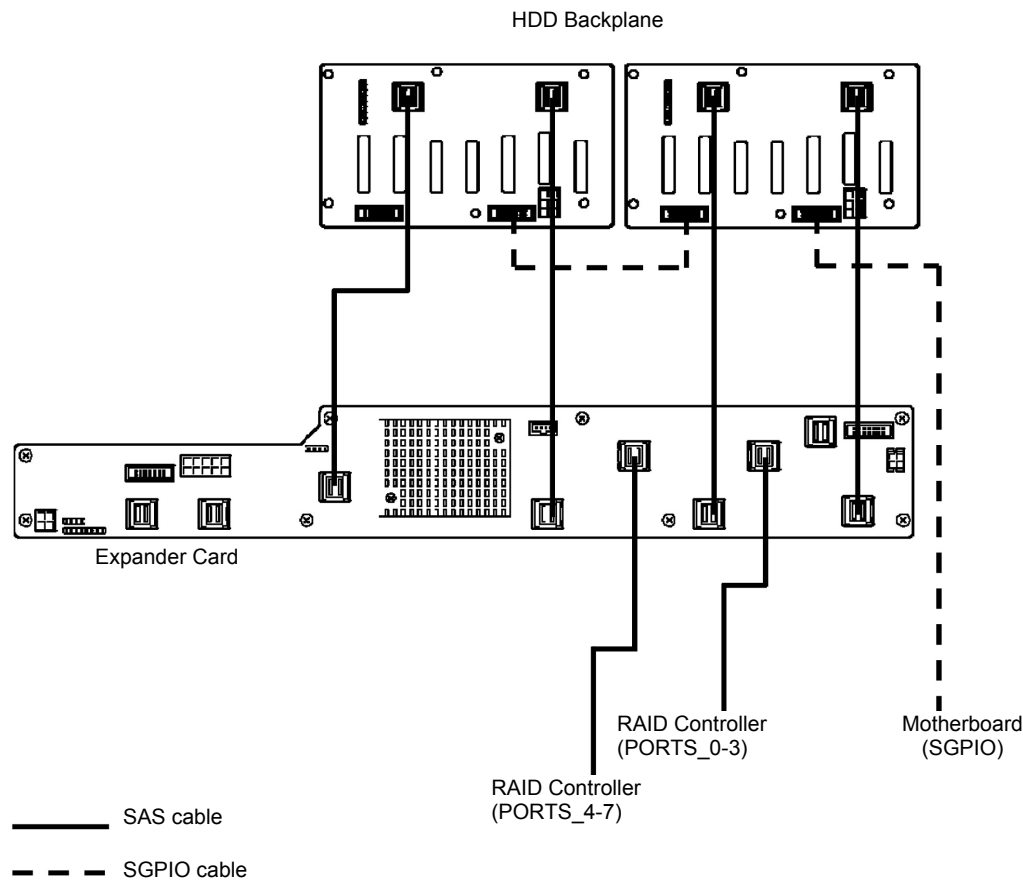
Motherboard	HDD backplane	Hard disk drive
SATA0-3	SAS0-3	Port 0
		Port 1
		Port 2
		Port 3

Using the optional RAID controller in 16x 2.5-inch drive models (1 to 8 HDDs)



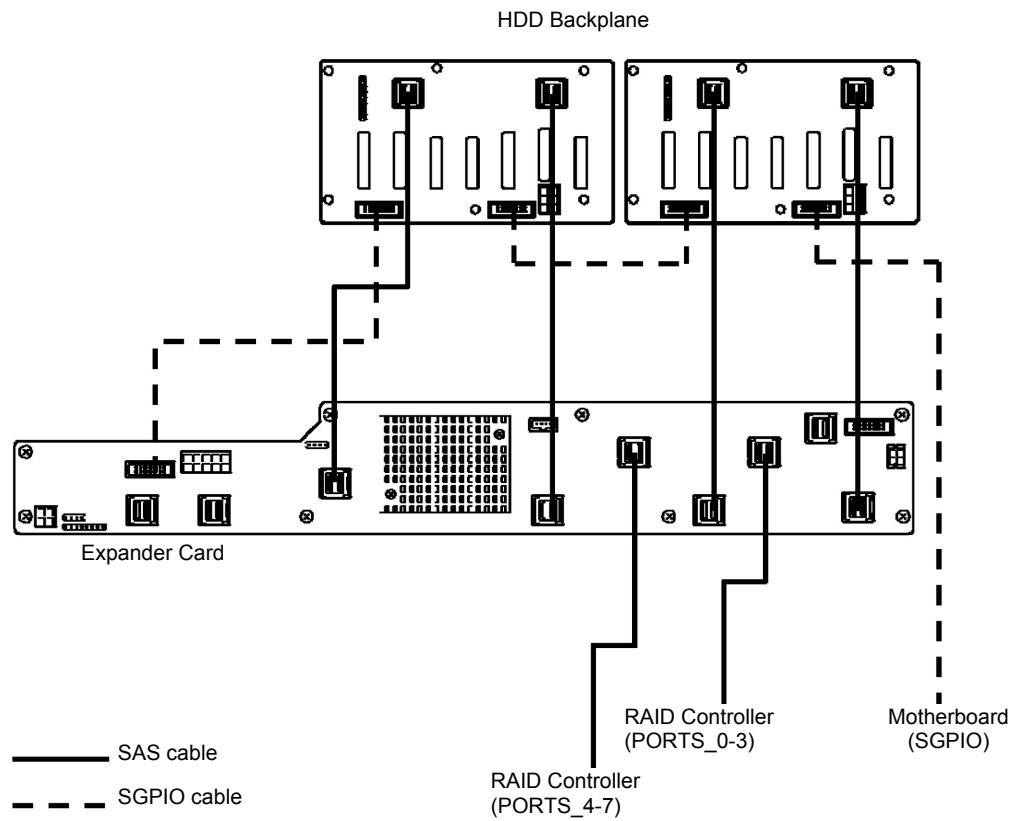
Optional RAID controller	HDD backplane	Hard disk drive
PORTS_0-3	SAS0-3	Port 0
		Port 1
		Port 2
		Port 3
PORTS_4-7	SAS4-7	Port 4
		Port 5
		Port 6
		Port 7

Using the optional RAID controller in 16x 2.5-inch drive models (1 to 16 HDDs)



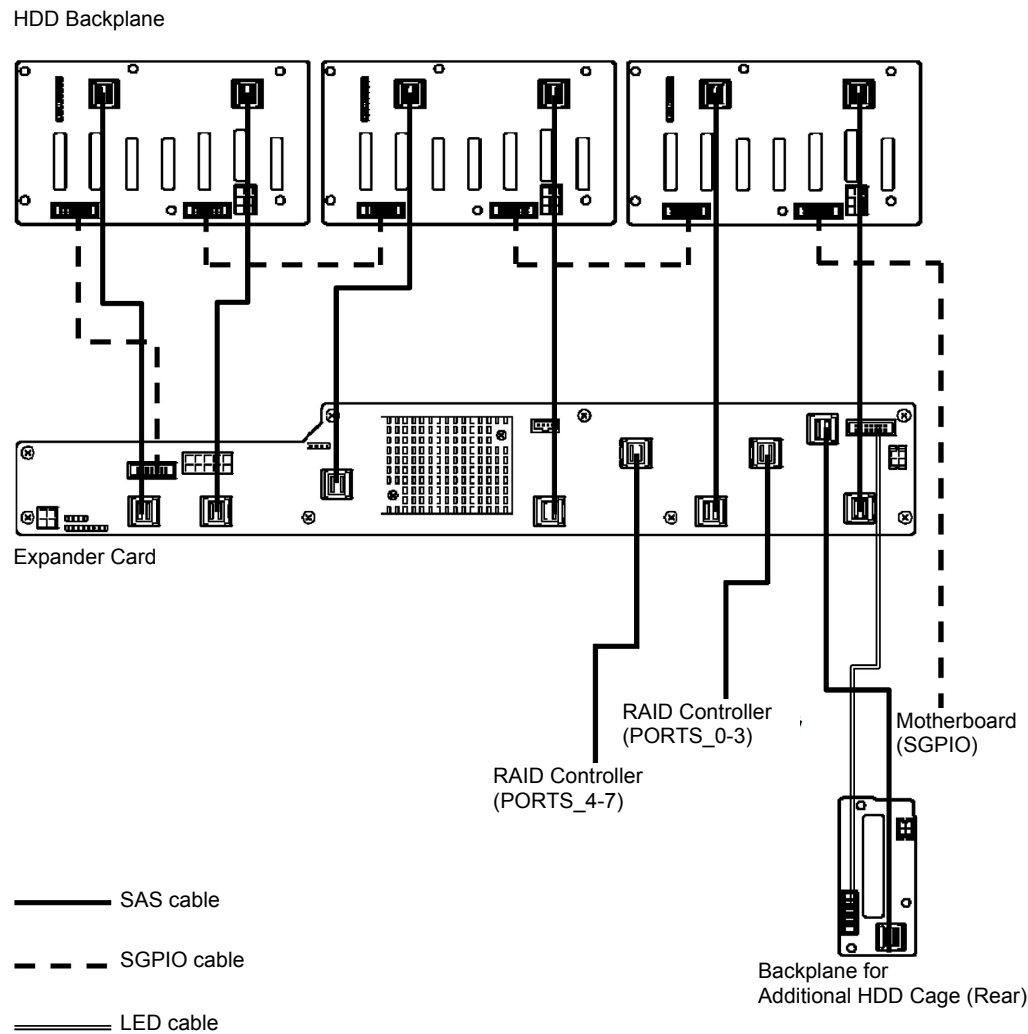
Optional RAID controller	Expander card		HDD backplane	Hard disk drive
PORTS_0-3	HD_IN0	HD_OUT0	HDD backplane (1) SAS0-3	Ports 0 to 15
		HD_OUT1	HDD backplane (1) SAS4-7	
PORTS_4-7	HD_OUT2	HD_OUT2	HDD backplane (2) SAS0-3	
		HD_OUT3	HDD backplane (2) SAS4-7	

Using the optional RAID controller in 26x 2.5-inch drive models (1 to 16 HDDs)



Optional RAID controller	Expander card		HDD backplane	Hard disk drive
PORTS_0-3	HD_IN0	HD_OUT0	HDD backplane (1) SAS0-3	Ports 0 to 15
		HD_OUT1	HDD backplane (1) SAS4-7	
		HD_OUT2	HDD backplane (2) SAS0-3	
PORTS_4-7	HD_IN1	HD_OUT3	HDD backplane (2) SAS4-7	-
		HD_OUT4	-	
		HD_OUT5	-	

Using the optional RAID controller in 26x 2.5-inch drive models (1 to 26 HDDs)

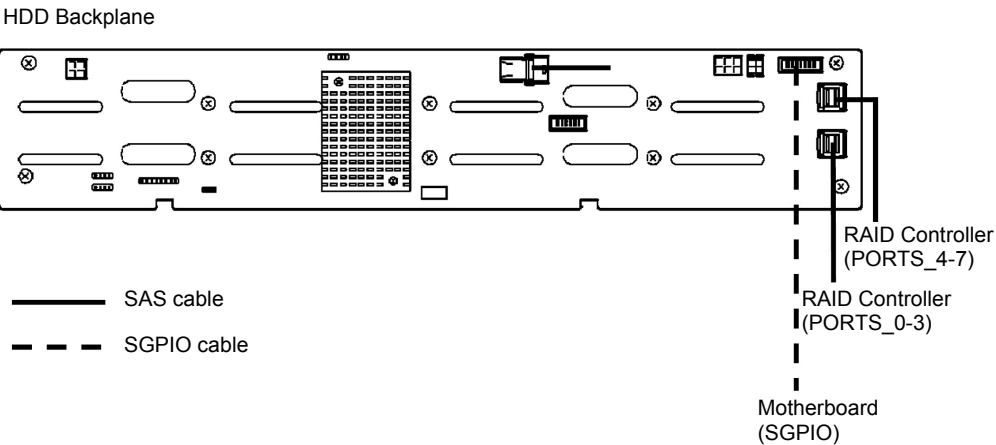




Optional RAID controller	Expander card		HDD backplane	Hard disk drive
PORTS_0-3	HD_IN0	HD_OUT0	HDD backplane (1) SAS0-3	Ports 0 to 23
		HD_OUT1	HDD backplane (1) SAS4-7	
		HD_OUT2	HDD backplane (2) SAS0-3	
PORTS_4-7	HD_IN1	HD_OUT3	HDD backplane (2) SAS4-7	
		HD_OUT4	HDD backplane (3) SAS0-3	
		HD_OUT5	HDD backplane (3) SAS4-7	

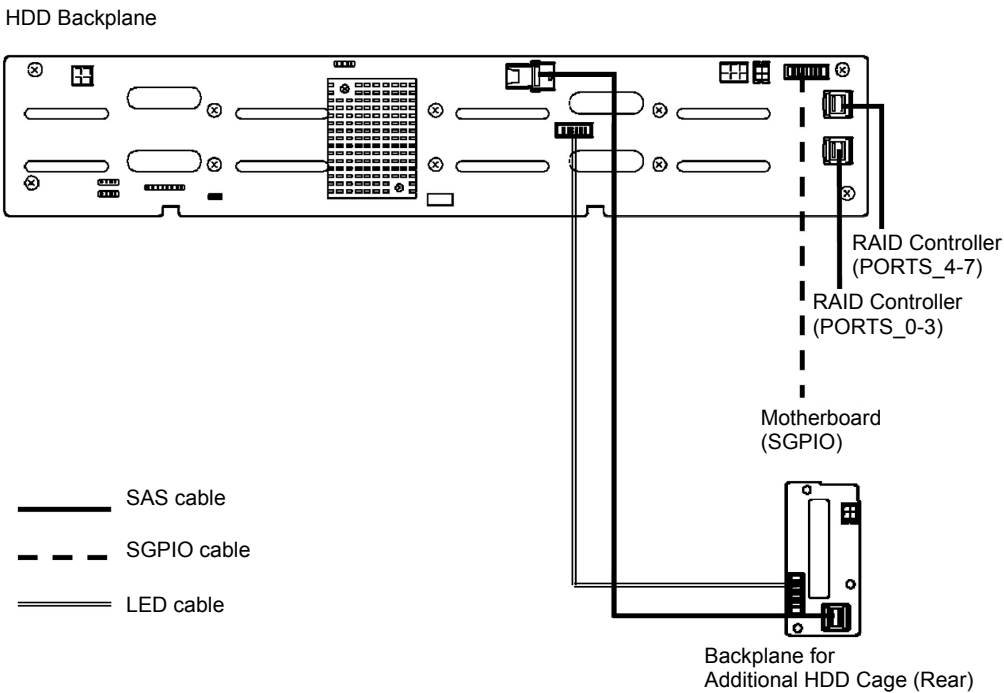
Expander card	HDD backplane (rear)	Hard disk drive
REAR_A-B	SASA_SASB	Port 24 Port 25

Using the optional RAID controller in 3.5-inch drive models (1 to 12 HDDs)



Optional RAID controller	HDD backplane	Hard disk drive
PORTS_0-3	SAS0-3	Ports 0 to 11
PORTS_4-7	SAS4-7	

Using the optional RAID controller in 3.5-inch drive models (1 to 14 HDDs)



Optional RAID controller	HDD backplane	Hard disk drive
PORTS_0-3	SAS0-3	Ports 0 to 11
PORTS_4-7	SAS4-7	

HDD backplane	HDD backplane (rear)	Hard disk drive
REAR_A-B	SASA_SASB	Port 12 Port 13

### 1.20.2 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 on-board RAID controllers or the optional RAID controller N8103-176 is used, the RAID system cannot be built in RAID5/RAID6/RAID50/RAID60.

RAID level	The minimum number of hard disk drives	
	On-board RAID Controller or N8103-176	N8103-177/178
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 an array group must have the same capacity, interface type, and rotational speed.
- EXPRESSBUILDER helps you to install the OS to a RAID array easily.
- If you want to install the OS manually, use RAID Configuration Utility at POST (Ctrl-R or HII). For details, see *Chapter 2 (5. RAID System Configuration)* in "Maintenance Guide" or the manual provided with the optional RAID controller (N8103-176/177/178).

#### Important

- Do not change the mode to hibernate while building a RAID system.
- Build a disk array in the RAID system using hard disk drives that have the same specifications (capacity, rotational speed, and standard).

---

## **1.21** Installing Air Duct

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Install the air duct in reverse order of removal. See *Chapter 2 (1.8 Removing Air Duct)*.

**Important**

Before removing the air duct, put cables aside. Otherwise, cables may be damaged if they are pulled together with air duct.

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## **1.22** Installing Support Bar

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Install support bar in reverse order of removal. See *Chapter 2 (1.7 Removing Support Bar)*.

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## **1.23** Installing Top Cover

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When all internal optional devices are installed, close the server with Top Cover.

1. Put the Top Cover straight on the server chassis so that it can be surely engaged with the chassis frame.
2. Slide the Top Cover toward the front of the server.
3. Tighten Cap Screw on rear of the server.

---

## 1.24 2.5-inch Hard Disk Drive

---

The server has an expansion bay for connecting 2.5-inch hard disk drive on the front of 16x 2.5-inch drive models and 26x 2.5-inch drive models, and the rear of the 26x 2.5-inch drive models and 3.5-inch drive models (when a 2.5-inch additional HDD cage (on the rear) is installed).

A hard disk drive mounted in a dedicated drive tray can be purchased. Install the hard disk drive on the server with it mounted in the drive tray.

**Important** Use hard disk drives specified by NEC. Installing a third-party hard disk drive might cause a failure of the server as well as the hard disk drive.

Note the following precautions to install hard disk drives.

- For onboard connection, hard disk drives having different capacities, types, or rotational speeds cannot be installed together.
- In the RAID system, all the hard disk drives in an array group must have the same capacity, type, and rotational speed.

Unique slot numbers have been assigned to each slot.

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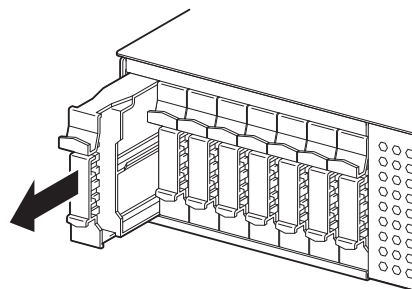
### 1.24.1 Installation

---

Install a hard disk drive by using the following procedure.

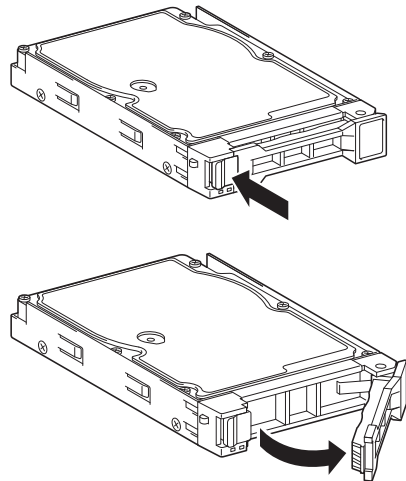
**Note** In the RAID system, use hard disk drives that have the same specifications (capacity, rotational speed, and standard) for each disk array.

1. See *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Locate the slot where you install the hard disk drive.  
Install hard disk drives in ascending order of slot number.
3. Remove the dummy tray.  
Dummy trays are installed in every slot as standard.

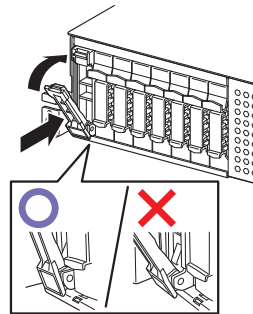


**Note** Keep the removed dummy trays for future use.

4. Unlock the handle of the tray.



5. 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.

6. Slowly close the handle.  
The tray is locked making a clicking sound.

**Note**

When you push the drive into the slot, confirm the handle got hooked on the frame.

7. Run BIOS Setup Utility, and then specify the boot order from **Boot** menu.  
For details, see *Chapter 3 (2. BIOS Setup Utility (SETUP))*.

**Tips**

The saved boot order is cleared when a hard disk drive is added.

### 1.24.2 Removal

To remove hard disk drive, reverse the installation procedure.

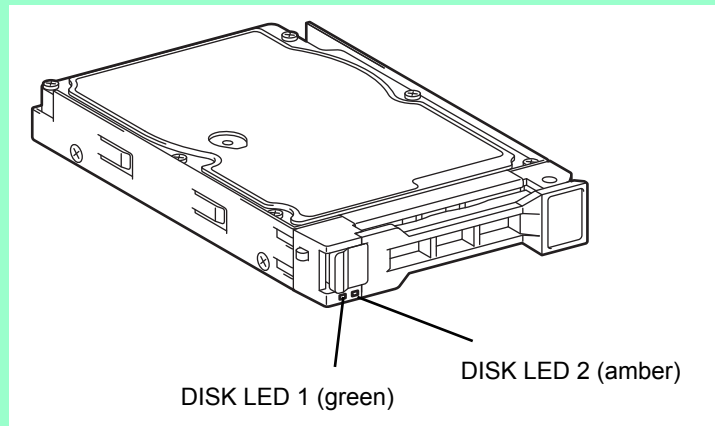
If you transfer or dispose of the removed hard disk drive, be sure to erase the user data.

#### Important

NEC assumes no liability for data leakage should the product be transferred to a third party without erasing the data.

#### Note

- If you remove a hard disk drive due to a failure, check the slot with its lower DISK LED lit in amber.



- Do not hold handle to pull the drive out. Doing so may damage the handle.

Run the BIOS Setup Utility, and then specify the boot order from **Boot** menu.  
For details, see *Chapter 3 (2. BIOS Setup Utility (SETUP))*.

#### Tips

The saved boot order is cleared when a hard disk drive is added.

### 1.24.3 Replacing a hard disk drive in the RAID System (Auto Rebuild)

In the RAID system, you can use the auto rebuild feature to restore data back to the state before a failure occurred.

The auto rebuild feature is enabled in logical drives set to RAID 1, RAID 5, RAID 6, RAID 10, RAID 50, and RAID60.

The disk array is automatically rebuilt when hot swapping (replacing a hard disk drive while the power on) a failed hard disk drive.

During the auto rebuild, DISK LEDs 1 and 2 on the hard disk drive blink green and amber respectively to indicate that the auto rebuild is being performed.

Observe the following precautions whenever executing the auto rebuild

- Do not turn off the server until the auto build completes after a hard disk drive fails.
- Leave an interval of at least 90 seconds between a hard disk drive removal and a hard disk drive installation.
- Do not replace a disk during the auto rebuilding of another hard disk drive (during an auto rebuild, DISK LEDs 1 and 2 on the hard disk drive blink green and amber respectively).



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## 1.25 3.5-inch Hard Disk Drive

---

The server has an expansion bay on the front of 3.5-inch drive models for connecting a 3.5-inch hard disk drive.

A hard disk drive mounted in a dedicated drive tray can be purchased. Install the hard disk drive on the server with it mounted in the drive tray.

**Important** Use hard disk drives specified by NEC. Installing a third-party hard disk drive might cause a failure of the server as well as the hard disk drive.

Note the following precautions to install hard disk drives.

- For onboard connection, hard disk drives having different capacities, types, or rotational speeds cannot be installed together.
- In the RAID system, all the hard disk drives in an array group must have the same capacity, type, and rotational speed.

Unique slot numbers have been assigned to each slot.

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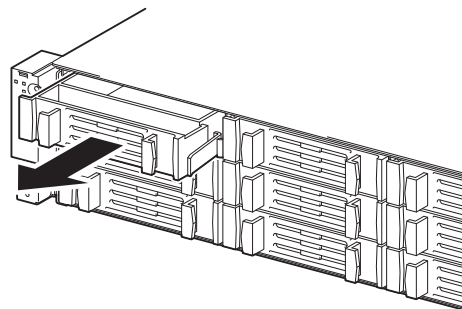
### 1.25.1 Installation

---

Install a hard disk drive by using the following procedure.

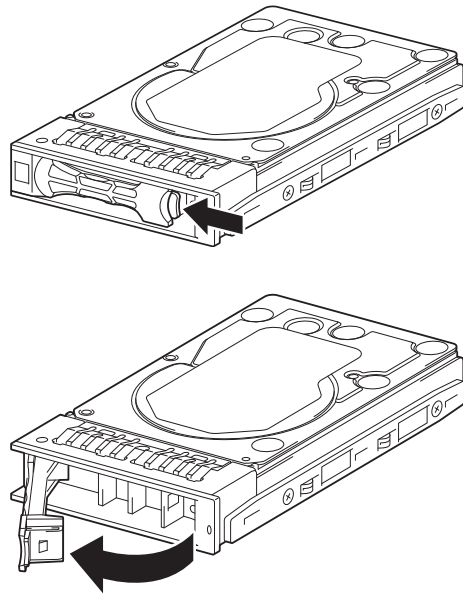
**Note** In the RAID system, use hard disk drives that have the same specifications (capacity, rotational speed, and standard) for each disk array.

1. See *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Locate the slot where you install the hard disk drive.  
Install hard disk drives in ascending order of slot number.
3. Remove the dummy tray.  
Dummy trays are installed in every slot as standard.

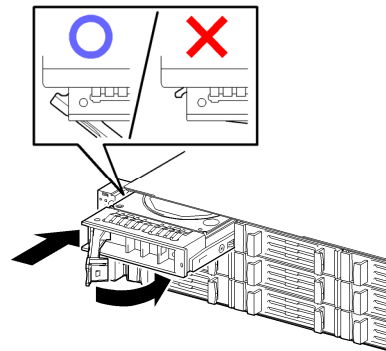


**Note** Keep the removed dummy trays for future use.

4. Unlock the handle of the tray.



5. 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.

6. Slowly close the handle.  
The tray is locked making a clicking sound.

**Note**

When you push the drive into the slot, confirm the handle got hooked on the frame.

7. Run BIOS Setup Utility, and then specify the boot order from **Boot** menu.  
For details, see *Chapter 3 (2. BIOS Setup Utility (SETUP))*.

**Tips**

The saved boot order is cleared when a hard disk drive is added.

### 1.25.2 Removal

To remove hard disk drive, reverse the installation procedure.

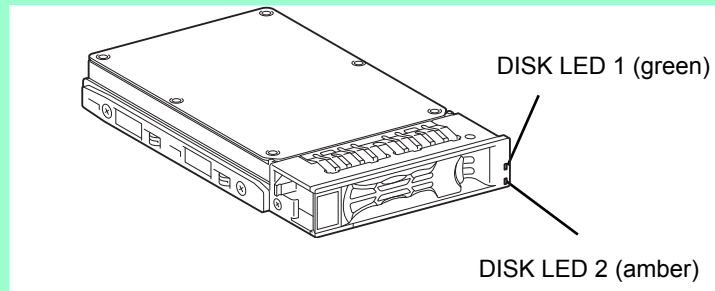
If you transfer or dispose of the removed hard disk drive, be sure to erase the user data.

#### Important

NEC assumes no liability for data leakage should the product be transferred to a third party without erasing the data.

#### Note

- If you remove a hard disk drive due to a failure, check the slot with its lower DISK LED lit in amber.



- Do not hold handle to pull the drive out. Doing so may damage the handle.

Run the BIOS Setup Utility, and then specify the boot order from **Boot** menu.  
For details, see *Chapter 3 (2. BIOS Setup Utility (SETUP))*.

#### Tips

The saved boot order is cleared when a hard disk drive is added.

### 1.25.3 Replacing a hard disk drive in the RAID System (Auto Rebuild)

In the RAID system, you can use the auto rebuild feature to restore data back to the state before a failure occurred.

The auto rebuild feature is enabled in logical drives set to RAID 1, RAID 5, RAID 6, RAID 10, RAID 50, and RAID60.

The disk array is automatically rebuilt when hot swapping (replacing a hard disk drive while the power on) a failed hard disk drive.

During the auto rebuild, DISK LEDs 1 and 2 on the hard disk drive blink green and amber respectively to indicate that the auto rebuild is being performed.

Observe the following precautions whenever executing the auto rebuild

- Do not turn off the server until the auto build completes after a hard disk drive fails.
- Leave an interval of at least 90 seconds between a hard disk drive removal and a hard disk drive installation.
- Do not replace a disk during the auto rebuilding of another hard disk drive (during an auto rebuild, DISK LEDs 1 and 2 on the hard disk drive blink green and amber respectively).

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## 1.26 Power Supply Unit

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This server can contain two power units supporting the hot-plug feature. 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.

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### 1.26.1 Cold Redundant Feature

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The server supports the feature to optimize power efficiency as described below:

- Cold redundant feature can run the system with optimum power efficiency by raising operating efficiency of primary power supply unit and lowering that of redundant power supply unit in redundant power configuration.
- If power efficiency of power units is not optimized due to system configuration, this feature is disabled automatically.

Cold redundant feature can be used under the following conditions:

- Two power supply units must be installed for redundant configuration.
- See *Chapter 3 (2. BIOS Setup Utility (SETUP))*, change parameters as shown below, save the settings and exit from SETUP.

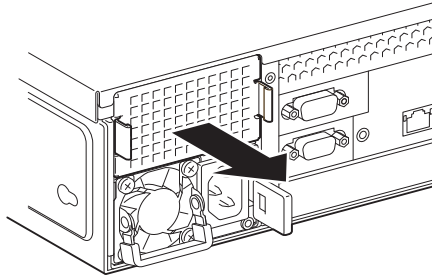
**Server → Power Control Configuration → Cold Redundant Mode → Enabled**

Run SETUP again, and check if the status of **Cold Redundant Mode** shows **Enabled** in **Server** menu.

### 1.26.2 Installation

Follow the steps below to install a power supply unit:

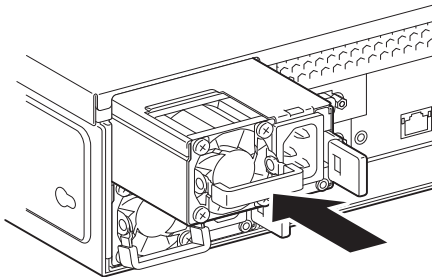
1. See steps 1 to 4 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the blank cover.



**Note**

Keep the removed blank cover for future use.

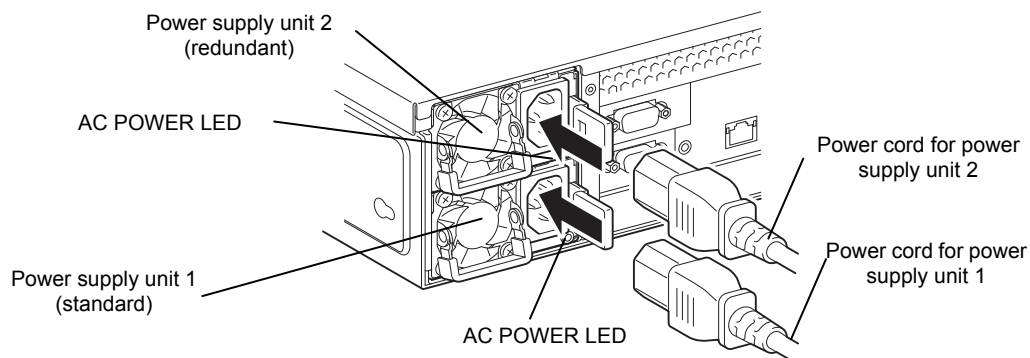
3. Insert the power supply unit until it is locked with clicking sound.



4. Connect the power cords.

AC POWER LED blinks green when the power cord is connected to either of power supply units and the other power supply unit's AC POWER LED goes on amber.

When the power cord is connected to it, AC POWER LEDs on both power supply units blink green.



5. Power on the server.

AC POWER LEDs go on green.

6. Confirm, by STATUS LED or on POST screen, that there are no errors related to the power supply units.


See *Chapter 3 (1. POST Error Message)* in "Maintenance Guide" for details on POST error messages.

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

### 1.26.3 Replacing a failed 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, see *Safety Precautions and Regulatory Notices*.

- Pay attention to electric hazard.

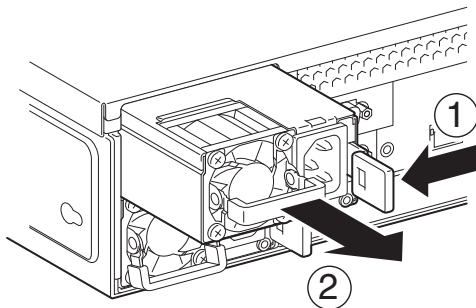
**Important** Do not remove a power supply unit operating normally.

1. Locate the failed power supply unit by the AC POWER LED on the power supply unit. The LED of the failed power supply unit is lit amber or blinking amber.
2. Power off the server.

**Tips**

In the redundant power configuration (with two power supply units) and if either one of power supply units fails, the failing power supply unit can be replaced with the system power on.

3. Disconnect the AC power cord from the failing power supply unit.
4. Push the lever of the failed 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 removed in Step 2.

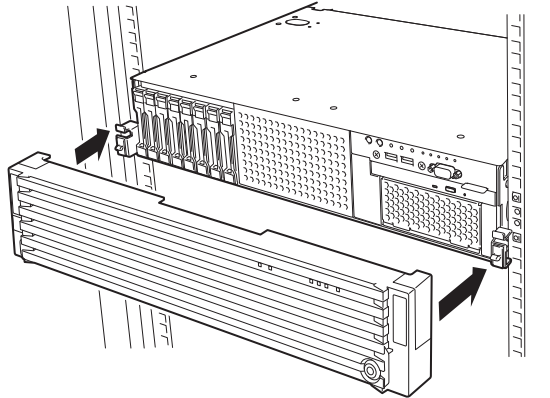
**Important** To keep the cooling effect in the server, be sure to install the blank cover in the vacant slot.

6. Install the new power supply unit taking steps 3 to 6 of "*Installation*", and confirm that the power supply unit is installed normally.

## 1.27 Installing Front Bezel

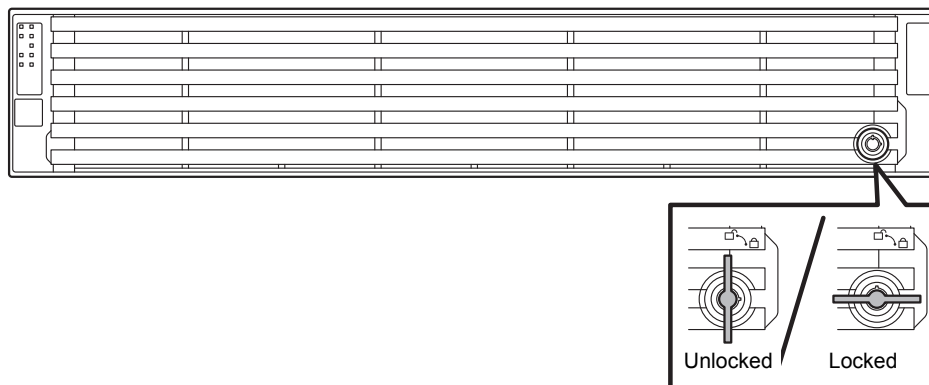
Confirm the vertical direction of front bezel, and push it straight into the chassis.

If you fail to mount the front bezel properly, the front bezel might be damaged.



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

After installing Front Bezel, lock it with Bezel Lock Key.



If you fail to mount the front bezel properly, the front bezel might be damaged. See *Safety Precautions and Regulatory Notices* that comes with your server for proper procedure for mounting.

## 2. Installation and Connection



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



### 2.1 Installation

This server must be mounted to a rack which conforms to EIA standards for use.

#### 2.1.1 Installing Rack

Refer to the manual that comes with your rack for how to install the rack, or consult with your sales representative.

 <b>WARNING</b>	
	<p>Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, see <i>Safety Precautions and Regulatory Notices</i>.</p> <ul style="list-style-type: none"> <li>• Use only in the specified environment.</li> <li>• Do not connect the ground wire to a gas pipe.</li> </ul>

 <b>CAUTION</b>	
	<p>Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, see <i>Safety Precautions and Regulatory Notices</i>.</p> <ul style="list-style-type: none"> <li>• Do not carry or install the server only by a single person.</li> <li>• Do not install the server so that the load may be concentrated on a specific point.</li> <li>• Do not install any components only by a single person. Confirm that hinge pins of the door are completely secured in place.</li> <li>• Do not pull out the server from the rack when the rack is unstable.</li> <li>• Do not leave more than one device being pulled out from the rack.</li> <li>• Do not provide the wiring for the server to exceed the rating of the power supply.</li> <li>• Do not use the server in the environment where corrosive gas is generated.</li> </ul>





Do not install the rack or server under the following environment. Doing so may cause malfunction of the server.

- Narrow space from which devices cannot be pulled out from the rack completely
- Place that cannot bear the total weights of the rack and devices mounted on the rack
- Place where stabilizers cannot be installed or where the rack can be installed only after the practice of proper earthquake-resistant construction
- Place of uneven or slanting floor
- Place of drastic temperature change (near a heater, air conditioner, or refrigerator)
- Place where intense vibration may be generated
- Place where corrosive gases (sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, ozone, etc) exist  
Place where the air (or dust) includes components accelerating corrosion (ex. sulfur, sodium chloride) or conductive metals
- Place where chemicals may be accidentally sprayed over
- Place where a carpet not subject to anti-static process is laid
- Place where some objects may be fallen on the rack
- Place near a device generating intense magnetic field (such as TVs, radios, broadcast/communication antennas, power transmission wires, and electromagnetic cranes) is placed.
- Place where the power cord of the server must be connected to an AC outlet that shares the outlet of another device with large power consumption
- Place near equipment that generates power noise (e.g., contact spark at power-on/power-off of commercial power supply through a relay).
- Environment where operation of the server is not guaranteed

### 2.1.2 Installing the server to the rack or removing it from the rack


Mount the server to the rack. (This section also describes the removal procedure.)


 **WARNING**



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

- Do not use any racks out of standards.
- Use only under the specified environment.

 **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.
- Do not install with the cover removed.
- Do not get your fingers caught.

#### Important

##### Temperature increases and airflow in the rack

If multiple devices are installed, or if the inside of the rack is not sufficiently ventilated, the internal temperature rises due to the heat emitted from each device, which may result in a malfunction. Review airflow in the rack and room and take sufficient measures so that the internal temperature will not exceed the operational temperature during operation.

Air enters the server from the front and exits from the rear.

## (1) Preparation

This server can be mounted to a rack made by NEC or other companies.

Check the rails in the following procedure before mounting the server to a rack.

**Important** Rail for left side has different shape from that for right side. Make sure the orientation of rails to properly install them.

### Checking inner rails

Make sure the orientation of inner rails.



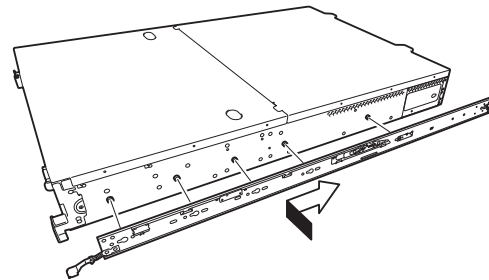
Inner rail (L)



Inner rail (R)

### Installing inner rails

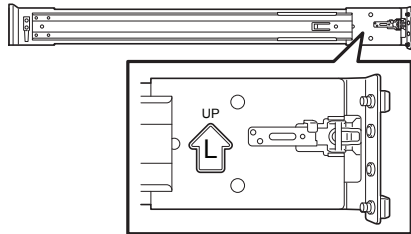
1. Mount an inner rail marked as "R" to the right side of the server and "L" to the left side when viewed the server from front.
2. Align inner rail with three protrusions on side of server chassis, and slide the inner rail toward rear of the server.  
Make sure the lock at around the center of inner rail clicks to indicate the rail is surely locked.  
Install another inner rail to opposite side in similar way.



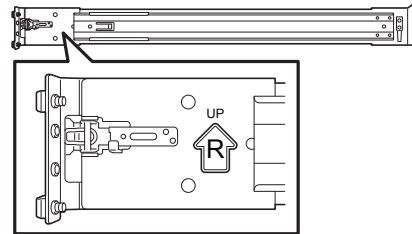
### Checking outer rails

Make sure the orientation of outer rails by viewing "L" or "R" marked on rail.

Mount an outer rail marked as "R" to the right side of the server and "L" to the left side when viewed the server from front.



Outer rail (L)



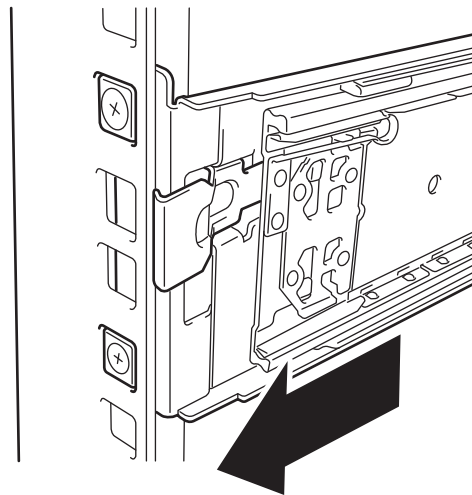
Outer rail (R)

### Installing outer rails

1. Fit the square-shaped protrusions of outer rail to the square holes of a 19-inch rack. Make sure that it makes a clicking sound indicating that it is locked.

The image on the right shows the front left side of the rack. Install to the rear left side and front and rear right sides following the same procedure.

Make sure that the rail is installed at the same height as the other rail already installed.




**Important** Confirm that the rails are securely locked so that they will not fall off.

**Tips** Although the rail may be somewhat unsteady, it is not defective.

## (2) Installation procedure

**⚠ CAUTION**



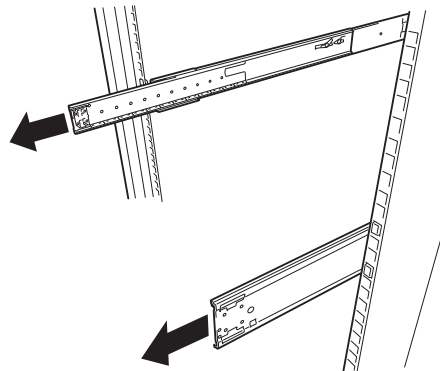
Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, see *Safety Precautions and Regulatory Notices*.

- Do not attempt to lift the server with single person.
- Do not drop.
- Do not leave the server being pulled out.
- Do not install with the cover removed.
- Do not get your fingers caught.

Mount the server to a rack in the following procedure.

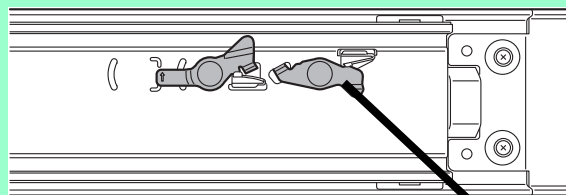
**Important** Always install the server with two or more persons.

1. Pull the slide rail from the outer rail until the slide rail is locked.



**Note**

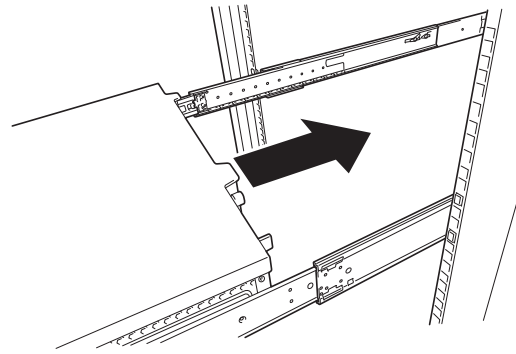
Make sure that locking mechanism work normally.



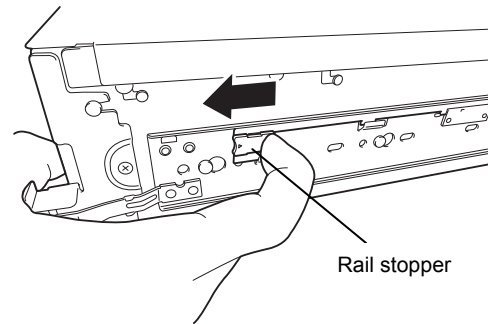
Locked state

Locking mechanism

2. With two or more persons, firmly hold the server and mount it to the rack.



3. When the server is pushed into the rack and is locked, push the server to the end while pulling the release levers (blue) on both sides of the server.



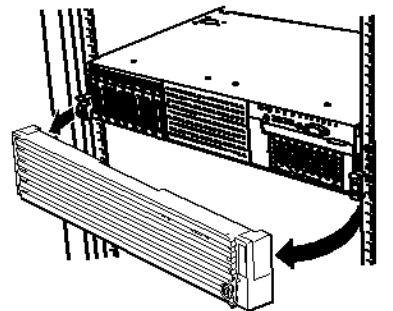
4. Push the server until its lock on front panel clicks.

### (3) Removal procedure

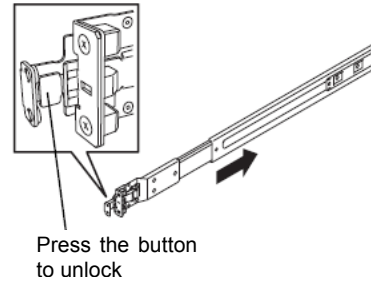
Remove the server from the rack in the following procedure.

**Important** At least two persons are required to remove the server from rack.

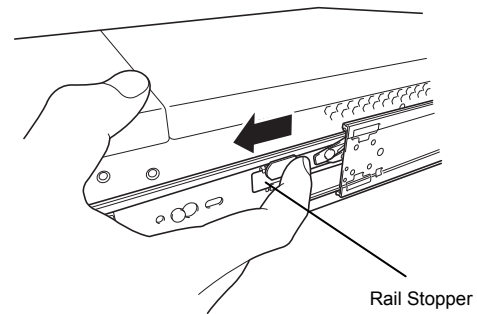
1. Make sure that the server is turned off and then disconnect the power cord or all interface cables from the server.
2. Remove the front bezel according to *Chapter 2 (1.5 Removing Front Bezel)*.



3. Slowly pull the server out while pressing the buttons located on both sides of the front of the server.



4. The server will come to a stop halfway. Press and hold Rail Stoppers (blue) on the rail and pull the server out of the rack.



**Important** Be careful not to get your fingers caught in the rails or lever.

5. Hold the server firmly and remove it from the rack.

**Important**

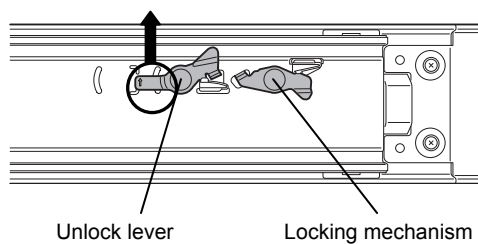
- While more than one person is supporting the bottom part of the server, slowly pull out the server.
- Do not apply pressure on the server from top when it is being pulled out. Doing so cause the server to drop.

#### (4) Removing outer rail

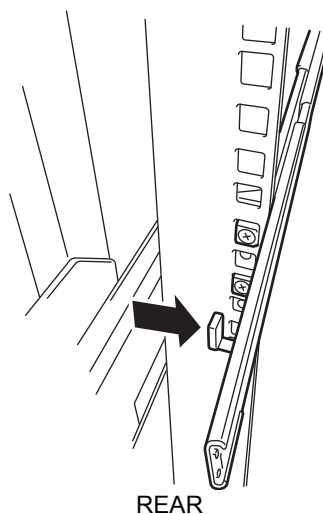
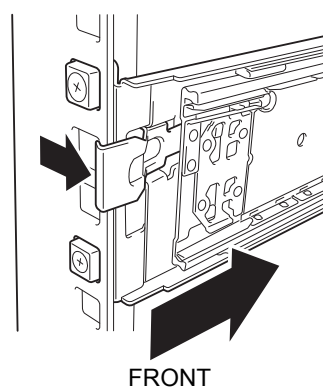
Remove outer rails from the rack in the following procedure.

1. See *Chapter 2 (2.1.2 (3) Removal procedure)* to remove the server from the rack.

2. Push the unlock lever on outer rail to the direction shown by arrow to house the slide rail.



3. While pressing the lever on outer rail, push the outer rail toward inside of the rack, and then remove it.







## 2.2 Connection

Connect peripheral devices to the server.


Connectors that allow a variety of peripheral devices to be connected are provided at the front and rear of the server. Images on the following pages show the peripheral devices that can be connected in their standard state and their respective connector positions.


 **WARNING**



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

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

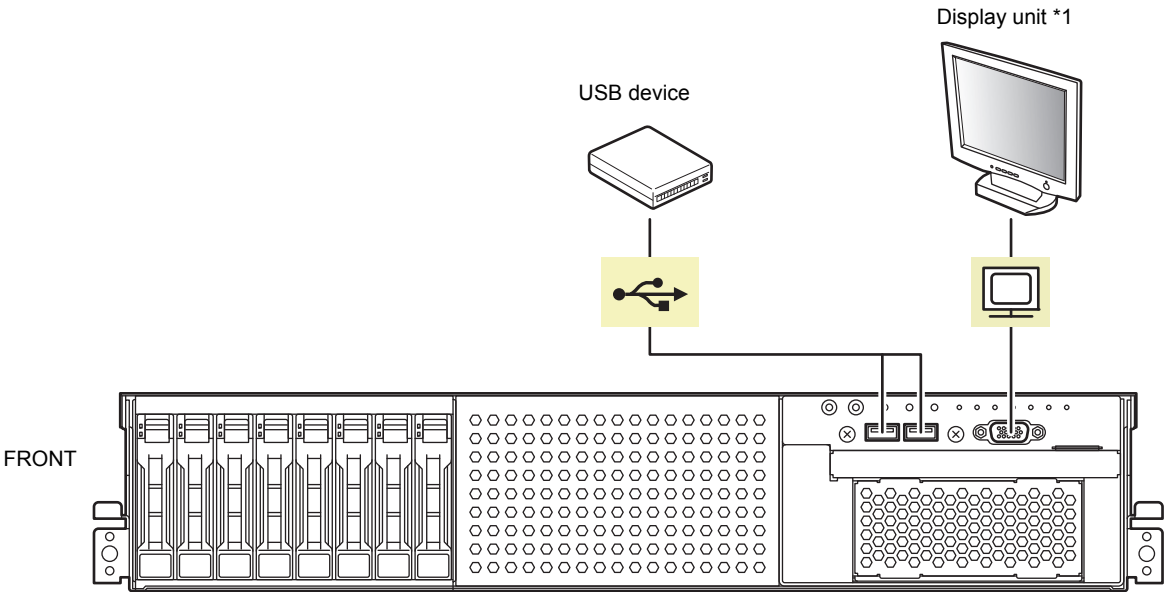
 **CAUTION**



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, see *Safety Precautions and Regulatory Notices*.

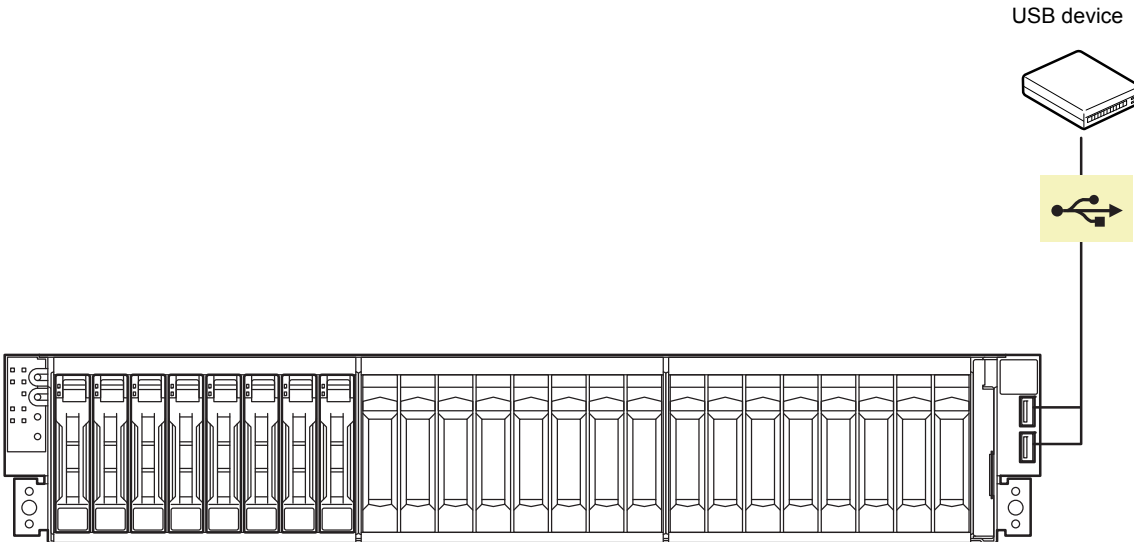
- Use only the specified outlet to insert.
- Do not connect the power cord to an outlet that has an illegal number of connections.
- Insert the power plug into the outlet as far as it goes.
- Use only the specified power cord
- Do not connect or disconnect the interface cable with the power plugged in the outlet.
- Use only the specified interface cable

Front of 16x 2.5-inch drive models

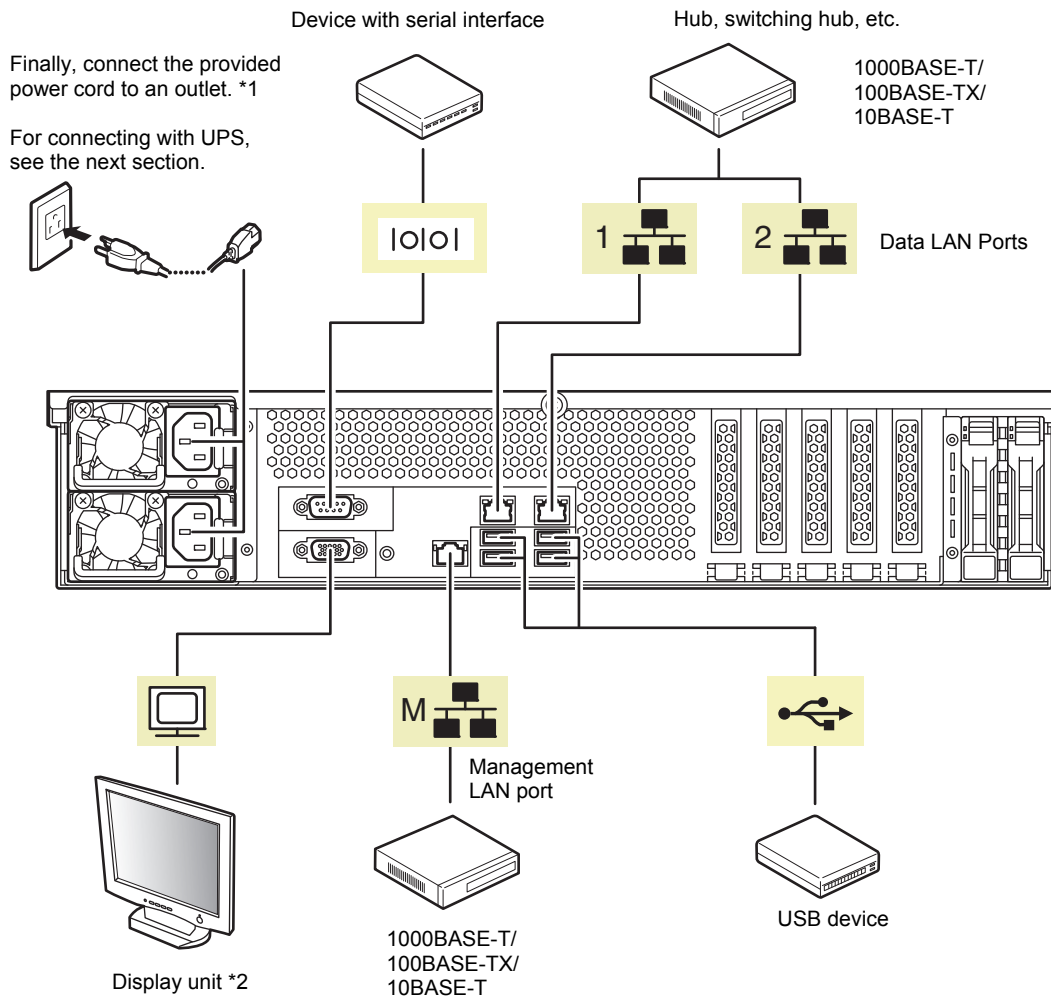


\*1 Either one can connect with a display unit.

Front of 26x 2.5-inch drive models



## Rear panel



\*1 Connect the power cord to a circuit breaker of up to 15 A.

\*2 Either of front or rear port can connect with a display unit.

## Tips

The serial port cannot be used to connect with leased line.

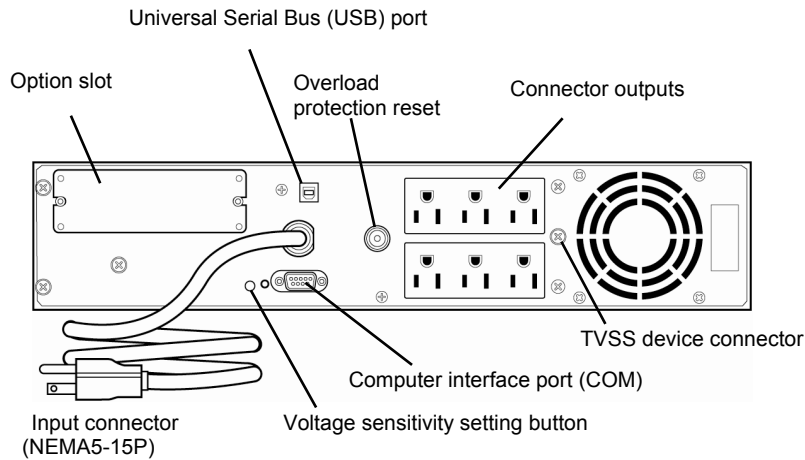
Note the following precautions to connect cables.

- When the device is not Plug and Play device, turn off the server and devices to be connected before connecting.
- If connecting any peripheral device and its interface cable made by other companies (a third party), contact your sales representative to check if they can be used with the server beforehand.
- Fix the power cord or interface cable with cable ties.
- Make sure that no pressure is applied on the plug of power cord.

### 2.2.1 Connecting to Uninterruptible Power Supply (UPS)

To connect the power cord of the server to a UPS, use the connector output on the rear of the UPS. For details, refer to the manual supplied with the UPS.

#### Example



When the power cord is connected to a UPS, change the BIOS settings in order to link the server with the power supply from the UPS.

To change the settings, select **Server** and then **AC-LINK** in BIOS Setup Utility, and change the displayed parameters. Select **Power On** to perform automatic operations by using the UPS. For details, see *Chapter 3 (2. BIOS Setup Utility (SETUP))*.

# NEC Express5800 Series Express5800/R120g-2E

# 3

## Setup

This chapter describes how to set up the server.

### 1. Turning on the Server

POST (Power-On Self-Test) is explained in this section.

### 2. BIOS Setup Utility (SETUP)

You can customize the BIOS settings by following the instructions in this section.

### 3. EXPRESSSCOPE Engine 3

EXPRESSSCOPE Engine 3 provides useful features through Baseboard Management Controller (BMC).

### 4. EXPRESSBUILDER

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 for at least 30 seconds before turning on the server after turning it off.

1. Turn on the peripheral devices and display unit.

## Note

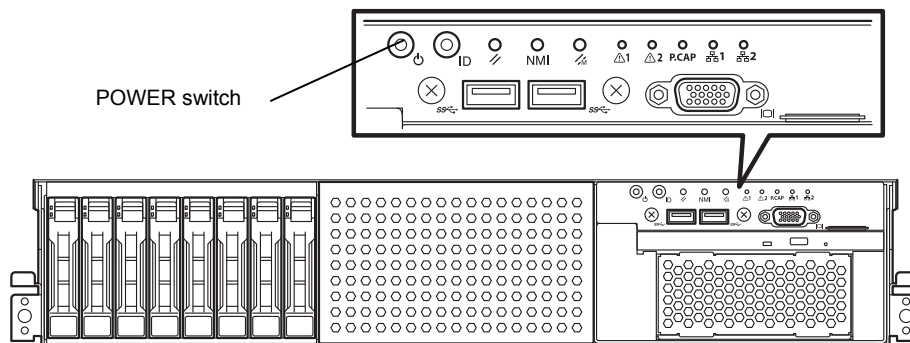
If the power cord is connected to power control system such as an Uninterruptible Power Supply (UPS), make sure that the power control system is turned on.

2. Remove Front Bezel.
3. If STATUS LED1, 2 are lighting green or amber, wait until it goes off.
4. Press POWER Switch at the front of the server.  
POWER LED is turned on green and after a while, logo appears on the display.

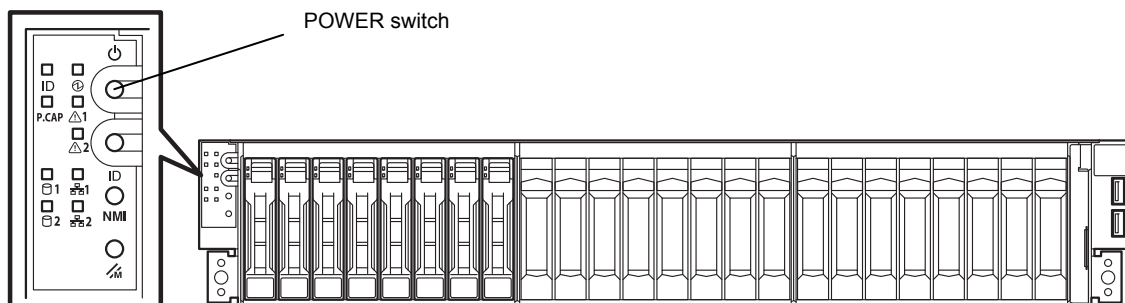
## Important

Do not connect or disconnect USB device while POST is running.

### 16x 2.5-inch Drive Model



### 26x 2.5-inch Drive Model / 3.5-inch Drive Model



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

POST (Power-On Self-Test) 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, DIMM, and processor (CPU). POST also displays the start-up messages of different utilities during the operation.

Usually, you do not need to check the contents of POST. However, check messages displayed at POST in the following cases.

- When introducing a server
- If you suspect a failure
- When you hear beep many times during the time between power ON and OS startup
- When any error message is displayed

## 1.1.1 POST sequence

Explains how POST runs in order.

1. When the server is turned on, POST starts, and an initialization message is displayed. The message to tell initialization of a memory and a PCI device. After an initialization message was displayed, a logo appears on the screen.



**Note**

- Keyboard becomes operable after the logo appears.
- While an initialization message is displayed, a screen is sometimes switched over to the screen by which nothing is displayed (black screen) several times. It's no problem for operation.
- An initialization message and logo may not be displayed by the occasion with which an option VGA controller was connected and setting of a BIOS setup utility (SETUP).
- An initialization message is not displayed on the console redirection screen of a serial port.

2. If **Enabled** is specified for **Password On Boot** in **Security** menu of SETUP, you will be prompted to enter password after the logo is displayed. 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. If <Esc> key is pressed, the logo disappears and the details of POST are displayed.

**Tips**

If **Quiet Boot** is **Disabled** from **Boot** menu in BIOS settings, the logo is not displayed and POST execution result is displayed..

4. After a while, the following message is displayed on the screen. (The on-screen message depends on your environment.)

Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network

By pressing the designated function key following messages, you can call the functions below upon completion of POST.

<F2> key: Run BIOS Setup Utility (SETUP). For information on the SETUP, see *Chapter 3 (2. BIOS Setup Utility (SETUP))*.

<F3> key: Run EXPRESSBUILDER from Internal Flash Memory. For information on EXPRESSBUILDER, see *Chapter 3 (4. EXPRESSBUILDER)*.

**Note**

- <F3> key is acceptable only for 5 seconds after the message is displayed.
- If bootable CD/DVD is inserted into optical disk drive, the system starts from CD/DVD even if <F3> key is pressed.

<F4> key: Run Offline Tools. For information on Offline Tools, see *Chapter 1 (9. Offline Tools) in "Maintenance Guide"*.

<F12> key: Boot from network.

**Tips**

If **One time** or **Always** is specified for **Power Management Policy** in **Server** menu of BIOS SETUP, a message indicating power consumption is being measured is displayed instead of the message shown above. Wait for a while until measurement is complete.

5. When **Legacy** is specified for **Boot Mode**, if a controller which has its dedicated BIOS such as a RAID Controller is installed, a message that prompts you to start the dedicated utility to configure the card is displayed.

**Example: If an optional RAID Controller is installed**

Press <Ctrl> <R> to Run MegaRAID Configuration Utility

The utility starts by pressing <Ctrl> + <R> keys.

For details on the utility, refer to the manual supplied with each optional board.

Depending on the configuration, the message "Press Any Key" might appear to prompt a key entry. This is a behavior of the BIOS of the optional board. Continue to operate after checking the manual of the optional board.

6. When **Secure Boot** is set to **Enabled** in **Security** menu and **Invalid Signature Detection** is set to **Halt** in BIOS Setup Utility (SETUP), the message will be displayed saying that the invalid signature data was detected in the following cases:

- The boot image in a bootable device is unsigned
- The signature of the boot image in a bootable device is illegal

In such cases, turn off this server and check that the signature of the boot image in a bootable device is correct. Connect the device for which Secure Boot is enabled to the server, and then turn on the server again.



7. The OS starts when POST is completed.

**Tips**

- When no bootable device is connected, the following message is displayed by terminating POST.  
Bootable media is not found.  
  
Press <F2> to enter SETUP.  
Press the <F2> key to boot the BIOS setup utility (SETUP).
- Even when any bootable device is connected, the following message may be displayed by stopping the utility.  
Bootable media is not found.  
  
Please restart this computer.  
In this case, the BIOS setup utility (SETUP) cannot be booted.

### 1.1.2 POST error messages

---

When POST detects an error, it displays an error message on the screen or beeps for some errors. For descriptions of error messages, causes, and countermeasures, see *Chapter 3 (1. POST Error Message) in "Maintenance Guide"*.

**Note**

Take notes on the indication displayed on display unit before consulting with your sales representative. Alarm messages are useful information for maintenance.

## 2. BIOS Setup Utility (SETUP)

This section describes how to configure Basic Input Output System (BIOS).

Make sure you have read and understood this section to configure properly.

## 2.1 Overview

BIOS Setup Utility (SETUP) is a utility to do basic hardware settings. This utility is installed in a flash memory in the server as standard and can be run without requiring a media for boot.

BIOS settings were configured with optimal settings before the server was shipped to you. Therefore, in most of cases, you should not need to use the SETUP. **Use only when the case applies to any of cases described in Chapter 3 (2.4 Cases that Require Configuration).**

## 2.2 Starting SETUP Utility

Run POST following *Chapter 3 (1.1.1 POST sequence)*.

After a while, the following message will be displayed on the lower left of the screen. (The on-screen message depends on your environment.)

Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network

If you press the <F2> key, SETUP starts upon completion of POST, and the **Main** menu is displayed.

## Tips

In Legacy boot mode, you can also launch SETUP by pressing the <F2> key while expanding option ROM.

### Password

If you have set a password, a message prompt you to enter password will be displayed.

Enter password[

You can attempt password entry up to 3 times. If you entered an incorrect password 3 times, operation stops. (You cannot operate further.) Turn off the power.

## Saving changes

If you finish configuration, select **Save & Exit** and then **Save Changes and Exit** to save changes and exit.

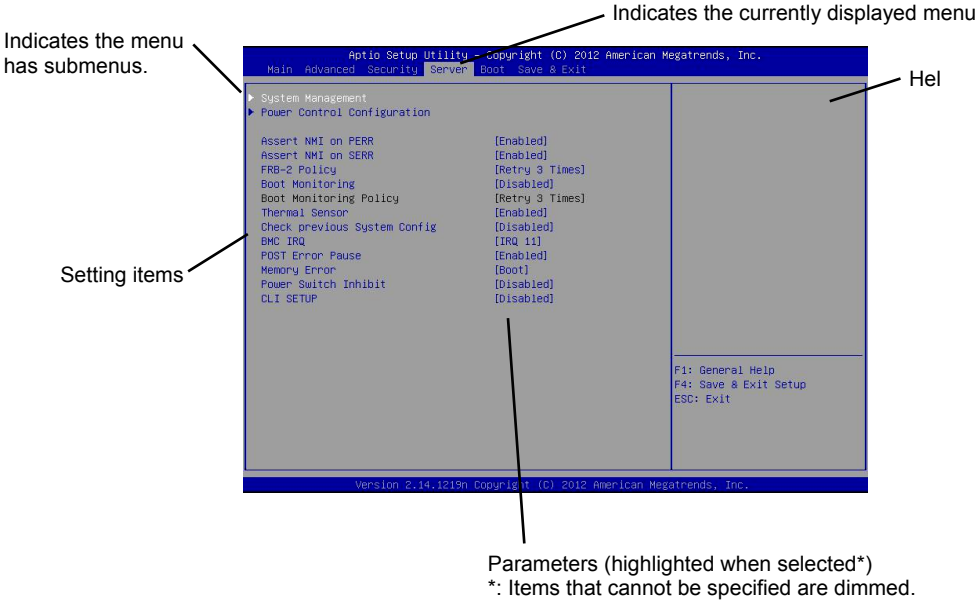
If you wish to exit without saving the changed parameters, select **Save & Exit** and then **Discard Changes and Exit**.

## Tips

- If you wish to restore the setting to default values, select **Save & Exit** and then **Load Setup Defaults**.
- The default value might be different from the factory setting.
- You cannot restore the default value in the following submenus in **Advanced** menu:
  - **iSCSI Configuration** submenu
  - **UEFI Driver Configuration** submenu

## 2.3 Description on On-Screen Items and Key Usage

This section shows display examples and how to control the key. Use the keyboard to work with SETUP.



- ☐ Cursor keys (<↑>, <↓>)  
Select an item displayed on the screen. If characters of an item are highlighted, that means the item is currently selected.
- ☐ Cursor keys (<←>, <→>)  
Select menus including **Main**, **Advanced**, **Security**, **Server**, **Boot**, and **Save & Exit**.
- ☐ <→> key/<+> key  
Change the value (parameter) of the selected item. You cannot use this key when a menu which has ► on the left is selected.
- ☐ <Enter> key  
Press this key to determine the selected parameter.
- ☐ <Esc> key  
Pressing this key cancels pop-up window. On the submenu, pressing this key takes you to the previous screen. On the top menu, the following window is displayed. If you select **Yes**, SETUP closes without saving the changed parameters.

Quit without saving?	
[Yes]	No

- ☐ <F1> key  
Press this key to display help information. If you need help using SETUP, press this key. Press <Esc> key to go back to the original screen.

☐ <F2> key

If you press this key, the following window appears. If you select **Yes**, the previous parameter(s) are restored. If you have saved changes by selecting **Save & Changes**, pressing the <F2> key restores the saved value.

Load Previous Values?	
[Yes]	No

☐ <F3> key

If you press this key, the following window appears. If you select **Yes**, restore the parameters of the currently selected item to the default setting. (**This might be different from the parameters configured before shipment.**)

Load Setup Defaults?	
[Yes]	No

**Note**

The values set on **iSCSI Configuration** submenu and **UEFI Driver Configuration** submenu are not returned to the default setting.

☐ <F4> key

If you press this key, the following window appears. If you select **Yes**, the parameter you configured is saved and SETUP closes.

Save configuration and exit?	
[Yes]	No

## 2.4 Cases that Require Configuration

Only if a case applies to any of following cases, use SETUP to change a parameter which was configured as factory setting. Other than cases described below, do not change the settings. A list of SETUP parameters and factory settings are described in **Chapter 2 (1. System BIOS)** in "**Maintenance Guide**".

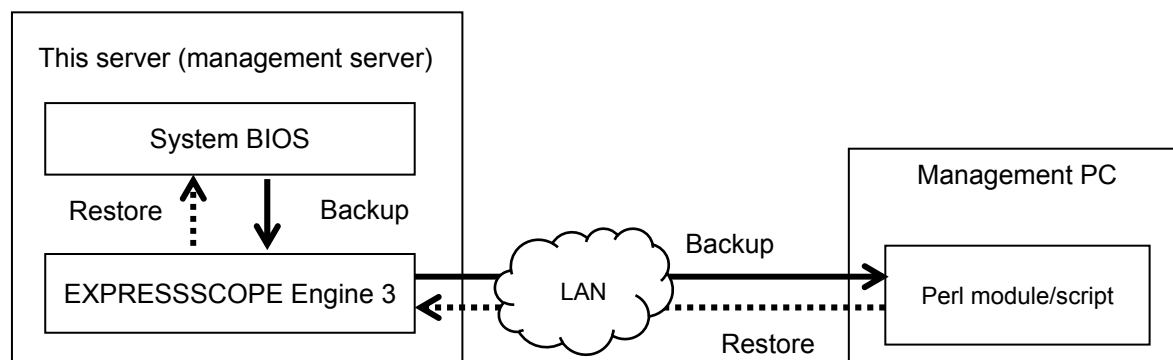
Category	Description	To be changed	Remark
Basic	Change date and time	<b>Main → System Date</b> <b>Main → System Time</b>	Configurable on OS
	On/Off NumLock on power ON	<b>Boot → Bootup Numlock State → ON or OFF</b>	
	On/Off the function to display NEC logo during POST	<b>Boot → Quite Boot → Disabled</b>	By pressing <Esc> key, prevent the display of the logo.
Memory	Add or change DIMM	<b>Advanced → Memory Configuration → Memory Retest → Yes</b>	After rebooting, <b>Memory Retest</b> changes <b>No</b> automatically.
	Use memory RAS feature	<b>Advanced → Memory Configuration → Memory RAS Mode → change to RAS mode</b>	Some of RAS features may not be used depending on DIMM configuration.
Optional board	Start the system from installed option board.	<b>Advanced → PCI Configuration → PCI Device Controller and Option ROM Settings → PCIX Slot Option ROM → Enabled</b>	XX is PCI slot number of the installed option board
Boot	Set the boot mode to UEFI mode according to your OS.	<b>Boot → Boot Mode → UEFI</b> Select UEFI mode for the following OS. – Windows Server 2012 – Windows Server 2012 R2	See "Before Starting Setup" in <i>Chapter 1 (Installing Windows)</i> in <i>Installation Guide</i> to determine the boot mode.
	Set the boot mode to Legacy BIOS mode according to your OS.	<b>Boot → Boot Mode → Legacy</b> Select Legacy mode for the following OS. – Windows Server 2008 R2	See "Before Starting Setup" in <i>Chapter 1 (Installing Windows)</i> in <i>Installation Guide</i> to determine the boot mode.
	Change the boot order of devices	<b>Boot → Boot Option Priorities → Change the boot priority</b>	When you use EXPRESSBUILDER DVD (option), set <b>CD/DVD</b> to the highest priority.
	Use remote power on feature (via RTC alarm)	<b>Advanced → Advanced Chipset Configuration → Wake On RTC Alarm → Enabled</b>	
	Use console redirection feature	<b>Advanced → Serial Port Configuration → Console Redirection Settings → Change respective setting.</b>	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.	<b>Advanced → Processor Configuration → X2APIC → Enabled</b> Enable X2APIC for the following OS. – Windows Server 2012 – Windows Server 2012 R2	See "Before Starting Setup" in <i>Chapter 1 (Installing Windows)</i> in <i>Installation Guide</i> to select <b>Enabled</b> or <b>Disabled</b> .
	Disable X2APIC feature according to your OS.	<b>Advanced → Processor Configuration → X2APIC → Disabled</b> Disable X2APIC for the following OS. – Windows Server 2008 R2	See "Before Starting Setup" in <i>Chapter 1 (Installing Windows)</i> in <i>Installation Guide</i> to select <b>Enabled</b> or <b>Disabled</b> .

Category	Description	To be changed	Remark
Security	Set a password	<b>Security</b> → <b>Administrator Password</b> → Enter a password (Set a password for Administrator first and then User)	There are two types of password; Administrator and User. Settings for User password is limited compared to for Administrator.
	Restrict bootup by entering password	<b>Security</b> → <b>Password on Boot</b> → <b>Enabled</b>	Can be selected when password is set.
	Execute TBOOT (Trusted Boot) using the option TPM kit.	Mount the option TPM kit, select [Security] and set the following items under the [Trusted Computing] submenu to [Enabled]. <ul style="list-style-type: none"> <li>• [TPM Support]</li> <li>• [TPM State]</li> <li>• [TXT Support]</li> </ul>	Do not disable TPM with the TPM management module with [TXT Support] set to [Enabled] and the OS started. Otherwise, it will be no longer possible to change [TPM Support] and [TXT Support]. In that case, execute [Save & Exit] and [Load Setup Defaults].
UPS Powerlink	When the server is supplied with power from UPS, always turn on the power.	<b>Server</b> → <b>Power Control Configuration</b> → <b>AC-LINK</b> → <b>Power On</b>	
	If it is turned off by using POWER switch, leave it OFF even when UPS supplies power.	<b>Server</b> → <b>Power Control Configuration</b> → <b>AC-LINK</b> → <b>Last State</b>	
	Keep the power OFF even when UPS supplies power.	<b>Server</b> → <b>Power Control Configuration</b> → <b>AC-LINK</b> → <b>Stay off</b>	

## 2.5 BIOS setting by network

### 2.5.1 Overview

You can backup and restore the BIOS setting via EXPRESSSCOPE Engine 3 by incorporating XPRESSSCOPE Engine 3 and BIOS.



**Tips**

See “EXPRESSSCOPE Engine 3 Scripting Guide” for the environment required for backup and restore of the BIOS setting, Perl modules and sample scripts.

#### ☐ Backup

You can download XML format files describing the BIOS setting (hereinafter called BIOS setting file) remotely via EXPRESSSCOPE Engine 3.

Turn off the power of this server or activate OS before downloading. You cannot download the BIOS setting file under the following conditions.

- During POST
- Immediately after the completion of POST
- Immediately after turning off the power of this server

**Tips**

- It may take several minutes to enable downloading after the completion of POST and turning off the power. Wait for a while before downloading.
- The time to enable downloading may vary depending on the configuration and the operating condition of this server.

### □ Restore

You can restore the BIOS setting by uploading the BIOS setting file remotely via EXPRESSSCOPE Engine 3. The uploaded BIOS setting file will be reflected to BIOS when the server is booted next time.

Turn off the power of this server or activate OS before uploading. You cannot upload the BIOS setting file under the following conditions.

- During POST
- Immediately after the completion of POST
- Immediately after turning off the power of this server

#### Tips

- It may take several minutes to enable downloading after the completion of POST and turning off the power. Wait for a while before downloading.
- The time to enable downloading may vary depending on the configuration and the operating condition of this server.

## 2.5.2 Backing up the BIOS setting

This section describes how to back up the BIOS setting file from the management PC via a network.

1. Turn off the power of this server or activate OS.
2. Execute Perl scripts.

The following processes are executed in the sample Perl script.

- HTTPS (or HTTP) connected to EXPRESSSCOPE Engine 3
- Login to EXPRESSSCOPE Engine 3
- Downloading the BIOS setting file

#### Tips

See “EXPRESSSCOPE Engine 3 User’s Guide” or “EXPRESSSCOPE Engine 3 Scripting Guide” for the user setting required for login to EXPRESSSCOPE Engine 3.

3. Store the output BIOS setting file to any folder as a backup file.

## 2.5.3 Restoring the BIOS setting

This section describes how to restore the BIOS setting file from the management PC via a network.

1. Refer to the backed up BIOS setting file and change the “operation” attribute of the “request\_id” element from “response” to “request”.

#### Note

Save the file in the following format.

- Character code: Unicode
- Encoding: UTF-8
- Line feed code: [CR+LF]

#### Tips

Do not change other attribute than “operation” of the “request\_id” element. If you change any other attribute, you may not restore the file correctly.



### ■ Before change (Example of the backed up BIOS setting file)

```
<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name="BIOS">
    <target>
      : (※略)
    </target>
    <request_id operation="response"/>
    <category name="Server" id="1">
      : (※略)
    </category>
  </component>
</root>
(※Descriptions for some items are omitted)
```

#### Tips

The "operation" attribute of the "request\_id" element indicates the request information of the BIOS setting file. It is set to "response" when the BIOS setting file is downloaded.

### ■ After change (Example of the BIOS setting file to be restored)

```
<?xml version="1.0" encoding="UTF-8"?>
<root xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsl="http://www.w3.org/1999/XSL/Transform" version="1.0">
  <component name="BIOS">
    <target>
      : (※Omitted)
    </target>
    <request_id operation="request"/>
    <category name="Server" id="1">
      : (※Omitted)
    </category>
  </component>
</root>
(※Descriptions of some items are omitted.)
```

2. Turn off the power of this server or activate OS.

3. Execute Perl scripts.

The following processes are executed in the sample Perl script.

- HTTPS (or HTTP) connected to EXPRESSSCOPE Engine 3
- Login to EXPRESSSCOPE Engine 3
- Uploading the BIOS setting file

#### Tips

See "EXPRESSSCOPE Engine 3 User's Guide" or "EXPRESSSCOPE Engine 3 Scripting Guide" for the user setting required for login to EXPRESSSCOPE Engine 3.

4. Turn on the power of this server if it is turned off. Restart OS if it is being started.

**Tips**

- The message notifying a change of the BIOS setting is displayed during POST. Then, this server automatically restarts.
- Download the BIOS setting file after the completion of POST and confirm that the BIOS setting has been restored.

### 2.5.4 Notes

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- **You can't back up or restore the following settings.**
  - [Main] - [System Language]
  - [Main] - [System Date]
  - [Main] - [System Time]
  - iSCSI Configuration sub menu
  - UEFI Driver Configuration sub menu
  - Booting priority of each device type ([Boot] - [CD/DVD Priorities], [Removable Priorities], [HDD Priorities], [Network Priorities])
- Display only menus (status and Revision) may not be backed up and restored
- You can't restore the backed up BIOS setting file for a different model.
- You can't restore the backed up BIOS setting file for a different BIOS version.
- A part of the BIOS setting is not reflected if the file is restored after changing the hardware configuration.  
Example: When you change the BIOS setting file backed up in the standard riser card configuration and restore it, you cannot restore the PCI3C Slot Option ROM setting.
- When you have restored the file after the completion of POST (after starting OS), upload the BIOS setting file and restart this server to reflect the setting to BIOS.  
It may take several minutes to download and upload the BIOS setting file. If you cannot download the file in 10 minutes or more while you use the remote KVM and remote media function of EXPRESSSCOPE Engine 3, disable these functions. Then, wait until the completion.

---

## **3. EXPRESSSCOPE Engine 3**

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### **3.1 Overview**

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EXPRESSSCOPE Engine 3 provides a variety of features using BMC (Baseboard Management Controller), which is a system management LSI.

See *EXPRESSSCOPE Engine 3 User's Guide* for detailed information.

EXPRESSSCOPE Engine 3 monitors the power supply unit, fans, temperature, and voltage of the server. If you have the management LAN port connected to the network, you can remotely perform the following over a web browser or SSH client:

- Manage the server
- Remotely control the keyboard, video, and mouse (KVM)\*
- Remotely access a CD/DVD/floppy disk/ISO image/USB memory\*.

\* To enable this feature, the optional license for remote management (N8115-04) is required.

To actualize these functions, virtual USB mass storage (Remote FD, Remote CD/DVD, Remote USB Memory, or Virtual Flash) is always connected as USB mass storage.

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### **3.2 EXPRESSSCOPE Engine 3 Network Configuration**

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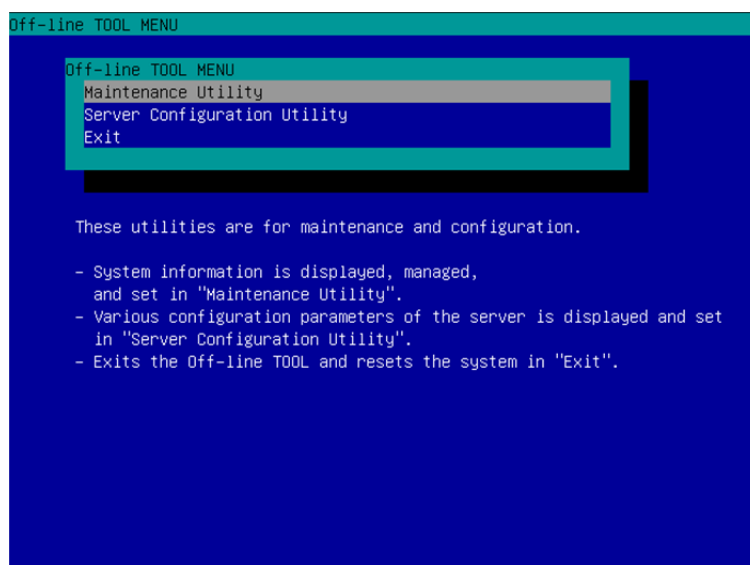
Take the steps below to use EXPRESSSCOPE Engine 3 through the Web browser.

1. Run POST following *Chapter 3 (1.1.1 POST sequence)*. Wait until the following message appears on the lower left of the screen.

Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network

2. Press the <F4> key while the message is being displayed to launch ROM Utility.
3. Select your keyboard type on Keyboard Selection screen.

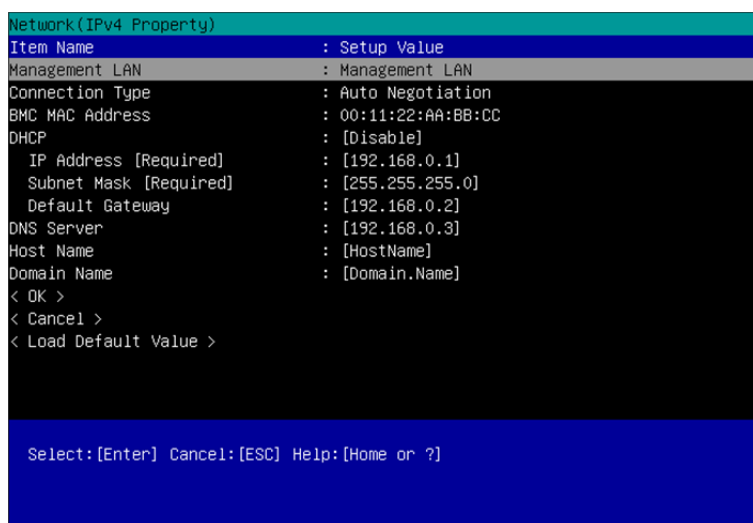
4. On Off-line TOOL MENU, select **Server Configuration Utility** → **EXPRESSSCOPE Engine 3** → **Configuration** → **Network** → **IPv4 Property** or **IPv6 Property**.



5. On the following screen, select **Enable** when you use DHCP, or select **Disable** and specify IP Address (Required), Subnet Mask (Required), Default Gateway, and DNS Server when you do not use DHCP.

#### Tips

If **Shared BMC LAN** is enabled, Web feature, remote media/KVM feature, or command line interface feature may be interrupted. In this case, wait for a while, and connect with network again.



When **IPv4 Property** is selected

6. Connect the LAN cable to the management LAN connector in order to connect to the network. It will be available for use if you access EXPRESSSCOPE Engine 3 via Web browser from management PC according to the setting.

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## 4. EXPRESSBUILDER

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EXPRESSBUILDER helps you to install Windows or maintain the server.

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### 4.1 Features of EXPRESSBUILDER

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EXPRESSBUILDER provides the following features.

Feature	Description
Setup (Windows reinstallation)	Installs Windows on your server. Easily completes the process from RAID configuration to installation of applications. To use this feature, select <b>OS installation</b> in Boot Selection Menu.
Bundled software	Stores NEC ESMPRO, Universal RAID Utility, and other bundled software.
Maintenance	Diagnoses the server. To use this feature, select <b>Tool menu</b> in Boot Selection Menu.
Manuals	Stores User's Guide, Installation Guide, Maintenance Guide, and other manuals.

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### 4.2 Usage of EXPRESSBUILDER

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Run EXPRESSBUILDER by the following way:

#### Internal Flash Memory

Ensure a CD/DVD is removed from the server, turn on the server, and then press <F3> key during POST.

#### Windows Application

Click the shortcut of NEC EXPRESSBUILDER on the desktop after installing Windows and Starter Pack.

#### EXPRESSBUILDER DVD

DVD does not come with the product. Download it from the following website.

<http://www.nec.com/>

- Support & Downloads

Set the DVD to an optical disk drive and restart this server or set the DVD to a computer running Windows.

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## **5. Installing Software Components**

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Continue to install software components such as OS.

See the instructions below.

- [Installation Guide \(Windows\)](#)

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## 6. Turning Off the Server

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Turn off the server by using the following procedure. If the power cord of the server is connected to a UPS, refer to the documentation supplied with the UPS or the documentation for the application controlling the UPS.

1. Shut down the OS.
2. The server automatically turns off after the OS shuts down.  
Confirm that POWER LED is off.
3. Turn off peripheral devices.

**Tips**

Hibernate function of Windows Server cannot be used. Do not set Hibernate at Windows shutdown.

## **NEC Express5800 Series Express5800/R120g-2E**

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# **4**

## **Appendix**

1. **Specifications**
2. **Interrupt Lines**
3. **Glossary**
4. **Revision Record**



# 1. Specifications

## 16x 2.5-inch Drive Models

Product Name			Express5800/R120g-2E (16x 2.5-inch Drive Models)							
Part Number			N8100-2464F, N8100-2465F, N8100-2466F, N8100-2467F							
Processor Part Number			N8101-1068F	N8101-1069F	N8101-1070F	N8101-1071F	N8101-1072F	N8101-1073F	N8101-1074F	N8101-1075F
CPU	Processor		Intel® Xeon® processor E5-2603v4	Intel® Xeon® processor E5-2609v4	Intel® Xeon® processor E5-2620v4	Intel® Xeon® processor E5-2623v4	Intel® Xeon® processor E5-2630v4	Intel® Xeon® processor E5-2650v4	Intel® Xeon® processor E5-2660v4	Intel® Xeon® processor E5-2690v4
	Clock speed		1.70GHz	1.70GHz	2.10GHz	2.60GHz	2.20GHz	2.20GHz	2.00GHz	2.60GHz
	Standard / Maximum Count		0/2							
	Intel® Smart Cache (Last Level Cache)		15MB	20MB		10MB	25MB	30MB	35MB	
	Number of cores (C) / Number of threads (T) per CPU (1CPU)		6C/6T	8C/8T	8C/16T	4C/8T	10C/20T	12C/24T	14C/28T	
	Chipset		Intel® C612 chipset							
Memory	Capacity, standard/maximum		Not pre-installed (selectable option) / Registered DIMM : 512GB (16x 32GB)							
	Memory module		DDR4-2400 Registered DIMM (4/8/16/32GB)							
Storage	Drive bay	Internal (standard)	-							
		Internal (maximum)	2.5-inch HDD: SATA 32TB (16x 2TB), SAS 28.8TB (16x 1.8TB), 2.5-inchSSD: SATA 25.6TB (16x 1.6TB), SAS 6.4TB (16x 400GB) (When optional HDD cage is installed)							
	Interface / RAID level		SATA 6Gb/s : RAID 0/1/10(standard), RAID 0/1/5/6/10/50/60 (optional), SAS 12Gb/s : RAID 0/1/5/6/10/50/60 (optional)							
	Optical disk drive		Internal or external drive (optional) *1							
	FDD		Optional: Flash FDD (1.44MB) *2							
	Expansion bay		1x 3.5-inch bay							
	Expansion slots	Supported slots		2x PCI Express 3.0 (x16 lane, x16 socket) (Low profile, length 200mm) 1x PCI Express 3.0 (x8 lane, x8 socket) (Low profile, length 200mm) 1x PCI Express 3.0 (x8 lane, x8 socket) (Low profile, length 168mm) (2-CPU configuration is required) 1x PCI Express 2.0 (x4 lane, x8 socket) (Low profile, length 168mm)						
Graphics		Chip / VideoRAM	Embedded management controller chip / 32 MB							
Standard Interface			5x USB3.0 *3 (2x Front(TypeA), 2x Rear (TypeA), 1x Internal (TypeA)), 3x USB2.0 (2x Rear (TypeA), 1x Internal (Box 10pin)), 2x Analog RGB (Mini D-Sub15 pin, 1x Front, 1x Rear), 1x Serial port (RS-232C compliant/Sub 9 pin, Serial port A, 1x Rear, optional port can be used (up to two ports in total), 2x 1000BASE-T LAN connector (1000BASE-T/100BASE-TX/10BASE-T supported, RJ-45, 2xRear), 1x Management LAN connector (1000BASE-T/100BASE-TX/10BASE-T supported, RJ-45, 1x Rear)							
Redundant power supply			Supported (optional, hot-plug available)							
Redundant fan			Supported (optional, hot-plug available)							
External dimensions (width × depth × height)*4			448.0 mm × 683.8 mm × 87.2 mm (front bezel / protrusions / slide rails excluded) 482.6 mm × 829.0 mm × 88.3 mm (front bezel / protrusions / slide rails included)							
Weight (Minimum*5 / Max.)			18 kg / 27 kg (including rails)							
Power Supply Unit			N8100-2464F: 460W 80 PLUS® Platinum compliant power supply (standard), N8100-2465F: 800W 80 PLUS® Platinum compliant power supply (standard), N8100-2467F: 1000W 80 PLUS® Platinum compliant power supply (standard), 460W/800W/1000W 80 PLUS® Platinum compliant (bipolar grounded outlet) (hot-plug available) (Max: 2) AC100V/200V±10%, 50/60Hz±3Hz N8100-2466F: 800W 80 PLUS® Titanium compliant power supply (standard), 800W 80 PLUS® Titanium compliant (bipolar grounded outlet) (hot-plug available) (Max: 2) AC200V±10%, 50/60Hz±3Hz							
Power consumption (100V at maximum configuration, at 25°C high-load state)			389VA/386W	399VA/396W	405VA/402W	427VA/424W	432VA/429W	512VA/508W	514VA/510W	590VA/586W
Power consumption (100V at maximum configuration, at maximum power)			578VA/574W	588VA/584W	607VA/603W	621VA/616W	645VA/641W	712VA/707W	729VA/724W	783VA/777W
Power consumption (200V at maximum configuration, at 25°C high-load state)			385VA/383W	395VA/392W	401VA/398W	423VA/420W	428VA/425W	507VA/503W	509VA/505W	584VA/580W
Power consumption (200V at maximum configuration, at maximum power)			573VA/569W	583VA/578W	601VA/597W	614VA/610W	639VA/634W	705VA/700W	722VA/717W	775VA/769W

Product Name	Express5800/R120g-2E (16x 2.5-inch Drive Models)							
Part Number	N8100-2464F, N8100-2465F, N8100-2466F, N8100-2467F							
Processor Part Number	N8101-1068F	N8101-1069F	N8101-1070F	N8101-1071F	N8101-1072F	N8101-1073F	N8101-1074F	N8101-1075F
Environmental requirements on Temperature	Operating: 5 to 40°C (when an option is installed: 5 to 45°C, subject to restrictions on configuration), Storage: -10 to 55°C							
Environmental requirements on Humidity	Operating: 20 to 80%, Storage: 20 to 80% (no condensation either when operating or when stored)							
Regulatory and Safety	FCC, UL, CB, CE, BSMI, UL(Mexico), CCC, RCM, RoHS, WEEE							
Supported OS	Supported by NEC	Microsoft® Windows Server® 2008 R2 Standard, Microsoft® Windows Server® 2008 R2 Enterprise, Microsoft® Windows Server® 2012 Standard, Microsoft® Windows Server® 2012 Datacenter, Microsoft® Windows Server® 2012 R2 Standard, Microsoft® Windows Server® 2012 R2 Datacenter, VMware ESXi™ 5.5 Update 3 *6, VMware ESXi™ 6.0 Update 1 or later *6						

- \*1 If you do not intend to install an internal DVD-ROM or an internal DVD SuperMULTI in all systems, prepare at least one external DVD-ROM per system for maintenance and OS reinstallation purposes.
- \*2 Prepare if needed. See Configuration Guide of "Overview of Flash FDD and Usecases" for how to use this device.
- \*3 Operates with USB2.0 interface when VMware ESXi 5.5 is installed.
- \*4 See "Front Bezel" in the Configuration Guide for external dimensions of the server with dust proof bezel installed.
- \*5 Minimum configuration for operation (1x CPU, 1x DIMM, 1x HDD, 1x Power supply unit)
- \*6 To install VMware ESXi™ 5.5 and 6.0, logical memory capacity must be larger than 5GB.

## 26x 2.5-inch Drive Models

Product Name			Express5800/R120g-2E (26x 2.5-inch Drive Models)		
Part Number			N8100-2468F, 2469F		
Processor Part Number			N8101-1070F	N8101-1072F	N8101-1073F
CPU	Processor		Intel® Xeon® processor E5-2620v4	Intel® Xeon® processor E5-2630v4	Intel® Xeon® processor E5-2650v4
	Clock speed		2.10GHz	2.20GHz	2.20GHz
	Standard / Maximum Count		0/2		
	Intel® Smart Cache (Last Level Cache)		20MB	25MB	30MB
	Number of cores (C) / Number of threads (T) per CPU (1CPU)		8C/16T	10C/20T	12C/24T
Chipset			Intel® C612 chipset		
Memory	Capacity, standard/maximum		Not pre-installed (selectable option) /Registered DIMM : 512GB (16x 32GB)		
	Memory module		DDR4-2400 Registered DIMM (4/8/16/32GB)		
Storage	Drive bay	Internal (standard)	-		
		Internal (maximum)	2.5-inch HDD: SATA 52TB (26x 2TB), SAS 46.8TB (26x 1.8TB), 2.5-inch SSD: SATA 41.6TB (26x 1.6TB), SAS 10.4TB (26x 400GB) (When optional HDD cage is installed)		
	Interface / RAID level		SATA 6Gb/s : RAID 0/1/5/6/10/50/60 (Required option), SAS 12Gb/s : RAID 0/1/5/6/10/50/60 (Required option)		
	Optical disk drive		External drive (optional) *1		
	FDD		Optional: Flash FDD (1.44MB) *2		
	Expansion bay		-		
	Supported slots		2x PCI Express 3.0 (x16 lane, x16 socket) (Low profile, length 200mm) 1x PCI Express 3.0 (x8 lane, x8 socket) (Low profile, length 200mm) 1x PCI Express 3.0 (x8 lane, x8 socket) (Low profile, length 168mm) (2-CPU configuration is required) 1x PCI Express 2.0 (x4 lane, x8 socket) (Low profile, length 168mm)		
Graphics	Chip / VideoRAM		Embedded management controller chip / 32 MB		
Standard Interface			5x USB3.0 *3 (2x Front (TypeA), 2x Rear (TypeA), 1xInternal(TypeA), 3x USB2.0(2x Rear(TypeA), 1x Internal(Box 10pin)), 1x AnalogRGB (Mini D-Sub 15pin, 1x Rear), 1x Serial port (RS-232C compliant/Sub 9 pin, Serial port A, 1x Rear, optional port can be used (up to two ports in total), 2x 1000BASE-T LAN connector (1000BASE-T/100BASE-TX/10BASE-T supported, RJ-45, 2x Rear), 1x Management LAN connector (1000BASE-T/100BASE-TX/10BASE-T supported,, RJ-45, 1x Rear)		
Redundant power supply			Supported (optional, hot-plug available)		
Redundant fan			Supported (optional, hot-plug available)		
External dimensions (width × depth × height)*4			448.0 mm × 683.8 mm × 87.2 mm (front bezel / protrusions / slide rails excluded) 482.6 mm × 829.0 mm × 88.1 mm (front bezel / protrusions / slide rails included)		
Weight (Minimum*5 / Max.)			18 kg / 30 kg (including rails)		
Power Supply Unit			N8100-2468F: 800W 80 PLUS® Platinum compliant power supply (standard), N8100-2469F: 1000W 80 PLUS® Platinum compliant power supply (standard) 800W/1000W 80 PLUS® Platinum compliant (bipolar grounded outlet) (hot-plug available) (Max: 2) AC100V/200V±10%, 50/60Hz±3Hz		
Power consumption (100V at maximum configuration, at 25°C high-load state)			545VA/541W	575VA/571W	614VA/610W
Power consumption (100V at maximum configuration, at maximum power)			746VA/741W	778VA/773W	829VA/824W
Power consumption (200V at maximum configuration, at 25°C high-load state)			539VA/535W	569VA/565W	608VA/604W
Power consumption (200V at maximum configuration, at maximum power)			739VA/733W	771VA/765W	821VA/815W

Product Name		Express5800/R120g-2E (26x 2.5-inch Drive Models)		
Part Number		N8100-2468F, 2469F		
Processor Part Number		N8101-1070F	N8101-1072F	N8101-1073F
Environmental requirements on Temperature		Operating: 5 to 40°C*6 (when an option is installed: 5 to 45°C, subject to restrictions on configuration), Storage: -10 to 55°C		
Environmental requirements on Humidity		Operating: 20 to 80%, Storage: 20 to 80% (no condensation either when operating or when stored)		
Regulatory and Safety		FCC, UL, CB, CE, BSMI, UL(Mexico), CCC, RCM, RoHS, WEEE		
Supported OS	Supported by NEC	Microsoft® Windows Server® 2008 R2 Standard, Microsoft® Windows Server® 2008 R2 Enterprise, Microsoft® Windows Server® 2012 Standard, Microsoft® Windows Server® 2012 Datacenter, Microsoft® Windows Server® 2012 R2 Standard, Microsoft® Windows Server® 2012 R2 Datacenter, VMware ESXi™ 5.5 Update 3 *7, VMware ESXi™ 6.0 Update 1 or later *7		

\*1 If you do not intend to install an internal DVD-ROM or an internal DVD SuperMULTI in all systems, prepare at least one external DVD-ROM per system for maintenance and OS reinstallation purposes.

\*2 Prepare if needed. See Configuration Guide of "Overview of Flash FDD and Usecases" for how to use this device.

\*3 Operates with USB2.0 interface when VMware ESXi 5.5 is installed.

\*4 See "Front Bezel" in the Configuration Guide for external dimensions of the server with dust proof bezel installed.

\*5 Minimum configuration for operation (1x CPU, 1x DIMM, 1x HDD, 1x Power supply unit)

\*6 If you operate the server in an environment where the temperature reaches 40°C, you cannot mount N8181-126 Redundant fan kit together with N8150-490, N8150-483, or N8150-518 SAS HDD on the 2.5-inch HDD cage (at the rear).

\*7 To install VMware ESXi™ 5.5 and 6.0, logical memory capacity must be larger than 5GB.

## 3.5-inch Drive Models

Product Name			Express5800/R120g-2E (3.5-inch Drive Models)		
Part Number			N8100-2470F, 2471F		
Processor Part Number			N8101-1068F	N8101-1070F	N8101-1072F
CPU	Processor		Intel® Xeon® processor E5-2603v4	Intel® Xeon® processor E5-2620v4	Intel® Xeon® processor E5-2630v4
	Clock speed		1.70GHz	2.10GHz	2.20GHz
	Standard / Maximum Count		0/2		
	Intel® Smart Cache (Last Level Cache)		20MB		25MB
	Number of cores (C) / Number of threads (T) per CPU (1CPU)		6C/6T	8C/16T	10C/20T
Chipset			Intel® C612 chipset		
Memory	Capacity, standard/maximum		Not pre-installed (selectable option) / Registered DIMM : 512GB (16x 32GB)		
	Memory module		DDR4-2400 Registered DIMM (4/8/16/32GB)		
Storage	Drive bay	Internal (standard)	-		
		Internal (maximum)	3.5-inch HDD: SATA 72TB (12x 6TB) + 2.5-inch HDD: SATA 4TB (2x 2TB), SAS 3.6TB (2x 1.8TB), 2.5-inch SSD: SATA 3.2TB (2x 1.6TB), SAS 800GB (2x 400GB) (When optional HDD cage (on the rear) is installed)		
	Interface / RAID level		SATA 6Gb/s : RAID 0/1/5/6/10/50/60 (Required option), SAS 12Gb/s : RAID 0/1/5/6/10/50/60 (Required option)		
	Optical disk drive		External drive (optional) *1		
	FDD		Optional: Flash FDD (1.44MB) *2		
	Expansion bay		-		
	Supported slots		2x PCI Express 3.0 (x16 lane, x16 socket) (Low profile, length 200mm) 1x PCI Express 3.0 (x8 lane, x8 socket) (Low profile, length 200mm) 1x PCI Express 3.0 (x8 lane, x8 socket) (Low profile, length 168mm) (2-CPU configuration is required) 1x PCI Express 2.0 (x4 lane, x8 socket) (Low profile, length 168mm)		
Graphics	Chip / VideoRAM		Embedded management controller chip / 32 MB		
Standard Interface			5x USB3.0 *3 (2x Front (TypeA), 2x Rear (TypeA), 1x Internal (TypeA)), 3x USB2.0(2x Rear (TypeA), 1x Internal(Box 10pin)), 1x Analog RGB (Mini D-Sub 15 pin, 1x Rear), 1x Serial port (RS-232C compliant/Sub 9 pin, Serial port A, 1x Rear, optional port can be used (up to two ports in total), 2x 1000BASE-T LAN connector (1000BASE-T/100BASE-TX/10BASE-T supported, RJ-45, 2x Rear), 1x Management LAN connector (1000BASE-T/100BASE-TX/10BASE-T supported, RJ-45, 1x rear)		
Redundant power supply			Supported (optional, hot-plug available)		
Redundant fan			Supported (optional, hot-plug available)		
External dimensions (width × depth × height)*4			448.0 mm × 683.8 mm × 87.2 mm (front bezel / protrusions / slide rails excluded) 482.6 mm × 829.0 mm × 88.1 mm (front bezel / protrusions / slide rails included)		
Weight (Minimum*5 / Max.)			18 kg / 31 kg (including rails)		
Power Supply Unit			N8100-2470F: 800W 80 PLUS® Platinum compliant power supply (standard), N8100-2471F: 1000W 80 PLUS® Platinum compliant power supply (standard) 800W/1000W 80 PLUS® Platinum (bipolar grounded outlet) (hot-plug available) (Max: 2) AC100V/200V±10%, 50/60Hz±3Hz		
Power consumption (100V at maximum configuration, at 25°C high-load state)			427VA/424W	437VA/434W	461VA/458W
Power consumption (100V at maximum configuration, at maximum power)			624VA/620W	634VA/630W	665VA/660W
Power consumption (200V at maximum configuration, at 25°C high-load state)			423VA/420W	432VA/429W	456VA/453W
Power consumption (200V at maximum configuration, at maximum power)			618VA/613W	628VA/623W	658VA/654W

Product Name		Express5800/R120g-2E (3.5-inch Drive Models)		
Part Number		N8100-2470F, 2471F		
Processor Part Number		N8101-1068F	N8101-1070F	N8101-1072F
Environmental requirements on Temperature		Operating: 5 to 40°C*6, Storage: -10 to 55°C		
Environmental requirements on Humidity		Operating: 20 to 80%, Storage: 20 to 80% (no condensation either when operating or when stored)		
Regulatory and Safety		FCC, UL, CB, CE, BSMI, UL(Mexico), CCC, RCM, RoHS, WEEE		
Supported OS	Supported by NEC	Microsoft® Windows Server® 2008 R2 Standard, Microsoft® Windows Server® 2008 R2 Enterprise, Microsoft® Windows Server® 2012 Standard, Microsoft® Windows Server® 2012 Datacenter, Microsoft® Windows Server® 2012 R2 Standard, Microsoft® Windows Server® 2012 R2 Datacenter, VMware ESXi™ 5.5 Update 3 *7, VMware ESXi™ 6.0 Update 1 or later *7		

- \*1 If you do not intend to install an internal DVD-ROM or an internal DVD SuperMULTI in all systems, prepare at least one external DVD-ROM per system for maintenance and OS reinstallation purposes.
- \*2 Prepare if needed. See Configuration Guide of "Overview of Flash FDD and Usecases" for how to use this device.
- \*3 Operates with USB2.0 interface when VMware ESXi 5.5 is installed.
- \*4 See "Front Bezel" in the Configuration Guide for external dimensions of the server with dust proof bezel installed.
- \*5 Minimum configuration for operation (1x CPU, 1x DIMM, 1x HDD, 1x Power supply unit)
- \*6 If you operate the server in an environment where the temperature reaches 40°C, you cannot mount N8181-126 Redundant fan kit together with N8150-490, N8150-483, or N8150-518 SAS HDD on the 2.5-inch HDD cage (at the rear).
- \*7 To install VMware ESXi™ 5.5 and 6.0, logical memory capacity must be larger than 5GB.

## 2. Interrupt Lines

Interrupt lines are assigned as factory settings as shown below. Use this table as a reference when you add optional devices.

### Interrupt lines

As factory settings, interrupt lines are assigned as follows.

IRQ	Peripheral Device (Controller)	IRQ	Peripheral Device (Controller)
0	System timer	12	SM Bus
1	–	13	Numeric data processor
2	–	14	–
3	COM 2 serial port	15	–
4	COM 1 serial port	16	SATA
5	PCI	17	
6	–	18	USB
7	PCI	19	USB
8	Real-time clock	20	
9	Microsoft ACPI-Compliant System	21	
10	PCI	22	
11	Motherboard resource	23	

## 3. Glossary

Terms	Description
BIOS Setup Utility (SETUP)	Software for setting BIOS. You can run this software by pressing <F2> key during POST.
BMC	Baseboard Management Controller (BMC) is a built-in controller that supports the IPMI version 2.0 protocol. BMC can manage the server hardware.
BMC RESET Switch	A switch for resetting the BMC of the server. This resets the BMC without clearing the BMC settings. Use the switch if the problem on the BMC occurs.
DUMP Switch	A switch that is used for collecting the memory dump if an error occurs. You can specify the destination of the dump by using the OS function.
EXPRESSBUILDER	Standard software for setting up the server easily. This also includes several useful applications and instruction manuals.
EXPRESSSCOPE ENGINE 3	A name of BMC for NEC Express5800 series.
EXPRESSSCOPE Profile Key	A removable flash memory that stored the settings of BIOS and BMC. If the motherboard of the server is replaced, you can use former settings when moving this flash memory from the former motherboard.
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.
Express Report Service (MG)	Software that can report the server failure to the contact center by E-mail, modem or HTTPS without NEC ESMPRO ServerAgentService. This software is installed with NEC ESMPRO Manager to "PC for Management".
ExpressUpdate	A feature for updating BIOS, firmware, driver, or software of the server. This feature is available when NEC ESMPRO Manager cooperates with EXPRESSSCOPE ENGINE 3 and ExpressUpdate Agent.
ExpressUpdate Agent	Software for performing ExpressUpdate. This is installed to the server.
Flash FDD	An optional USB device that can use as a floppy disk drive.
Internal Flash Memory	A built-in flash memory that stored EXPRESSBUILDER as standard. You can start EXPRESSBUILDER from it without DVD when pressing <F3> key during POST.
NEC ESMPRO	Standard software for the server management. This consists of several applications for managing or monitoring.
NEC ESMPRO Agent Extension	Software for performing the scheduled operations. This works with NEC ESMPRO Manager.
NEC ESMPRO Manager	Software for managing plural servers on network.
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.
OEM driver	A Windows driver for the mass storage device.
OS standard installer	An installer that stored in Windows installation disc. Use this installer if you want to install the OS manually.
Offline tools	Software that can confirm or change SEL, SDR, FRU, and other IPMI data. You can start Offline tools when pressing <F4> key during POST.
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 or event logs. You can easily collect the data for the server maintenance by using this software.
RAID Configuration Utility	Software for configuring RAID arrays. You can run this software during POST.
Server Configuration Utility	Software for setting BIOS or BMC. You can use as Windows application or run this software when pressing <F4> key during POST. This software is the same as BMC Configuration of former models.
Starter Pack	Software package for the server. This software includes the customized drivers for Windows. This must be installed before using Windows on the server.
TPM Kit	An optional product of Trusted Platform Module for the server.
Universal RAID Utility	Software for setting RAID arrays on Windows/Linux. This software is operated on "PC for Management" with NEC ESMPRO Manager.
Windows OS parameter file	A file that saved settings for installing Windows. You can install with the saved settings in this file when setting Windows with EXPRESSBUILDER.



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# 4. Revision Record

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Document Number	Date Issued	Description
10.115.02-101.01	April 2016	Newly created

NEC Express Server  
Express5800/R120g-2E  
User's Guide

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