

User's Guide

NEC Express Server
Express5800 Series

Express5800/R110i-1 EXP335, 335A

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.
Read these cautions before using this server.



Getting Started

Describes how to use this server, from unpacking to operations.
See this guide first and read the outline of this product.

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 details of system BIOS settings, RAID Configuration Utility, and EXPRESSBUILDER
Chapter 3: Appendix	Error messages and Windows Event Logs



Other manuals

The details of NEC ESMPRO, Universal RAID Utility, and other features

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Conventions Used in This Document

Signs and symbols for safety

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



WARNING

Indicates there is a risk of death or serious personal injury



CAUTION

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

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

	Attention	This symbol indicates the presence of a hazard if the instruction is ignored. An image in the symbol illustrates the hazard type.	(Example)
	Prohibited Action	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action.	(Example)
	Mandatory Action	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard.	(Example) (Disconnect a plug)

(Example in this guide)

Symbol to draw attention

Description of a warning

Term indicating a degree of danger

WARNING

Use only the specified outlet

Use a grounded outlet with the specified voltage. Use of an improper power source may cause a fire or a power leak.

Notations used in the text

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

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

Optical disk drive

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

- DVD-ROM drive
- DVD Super MULTI drive
- DVD Dual drive

Hard disk drive

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

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

Removable media

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

- USB flash drive
- Flash FDD

Abbreviations of Operating Systems (Windows)

Windows Operating Systems are referred to as follows.

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

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

POST

POST described in this document refers to the following.

- Power On Self-Test

BMC

BMC described in this document refers to the following.

- Baseboard Management Controller

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EDK/EDKII

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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 the 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.

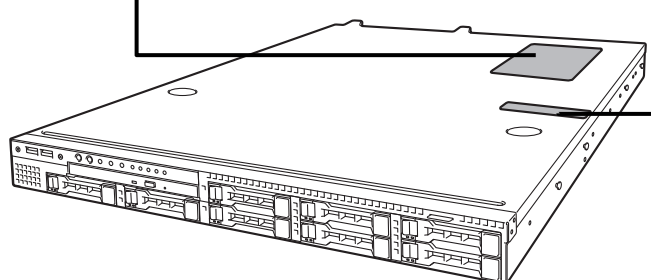
Warning labels

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

Do not remove or black out the 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るようにして下さい。 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. 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. 有的部件可能余温较高, 请注意待其冷却之后再接触。 有的部件可能余温较高, 请注意待其冷却之后再接触。</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。 Some internal components may still be operational on battery power. Refer to instruction manuals for this system as well as options prior to maintenance. 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. 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, 请认真阅读设备的使用说明书。 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, 请认真阅读设备的使用说明书。</p>	
<p>オプションの脱付け、取外し等はすべての電源プラグをコンセントから抜き、外部装置と接続しているケーブルを外して下さい。 Disconnect all AC power cords from both system and external peripherals prior to installing/removing options. Déconnectez tous les câbles CA du système et des périphériques externes avant d'installer/d'enlever les dispositifs en option. 进行可选配件的安装和拆卸时, 请从插座拔下全部的电源插头并分离与外部设备的线缆。 进行可选配件的安装和拆卸时, 请从插座拔下全部的电源插头并分离与外部设备的线缆。</p>	
<p>ネジは本体内部へ落とさないでください。 Do not drop any screws inside the system. Ne laissez tomber aucune vis à l'intérieur du système. 请务必注意不要让螺丝掉入设备内部。 请务必注意不要让螺丝掉入设备内部。</p>	
<p>ボード及びオプション装置の接続の際は、必ずユーザーズガイドを参照し、正しく接続して下さい。 誤った接続は、故障や火災の原因となります。 Refer to the "User's Guide" when option board or peripherals are installed. Incorrect installations may result in damage to the system and lead to accidents. 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. 连接板卡及可选设备时, 请务必参照“用户指南”进行正确连接。连接错误, 有可能造成故障或火灾。 连接板卡及可选设备时, 请务必参照“用户指南”进行正确连接。连接错误, 有可能造成故障或火灾。</p>	
<p>傷をばさず、多めに触らないように注意して下さい。 To avoid the risk of personal injury, be careful when accessing the inside of the system. Pour éviter tout risque de blessure, faites attention en accédant à l'intérieur du système. 请务必小心不要夹伤或碰伤手指。 请务必小心不要夹伤或碰伤手指。</p>	
<p>重量の持ち上げ、移動の際は、重量の底面をしっかりと持ち上げて下さい。 Firmly hold the bottom of the system when required to lift and carry the system. Saisissez fermement le fond du système au cas où vous devez soulever et transporter le système. 抬起、移动设备时, 请牢牢抓住设备底部将其抬起。 抬起、移动设备时, 请牢牢抓住设备底部将其抬起。</p>	

2.5-inch drive model

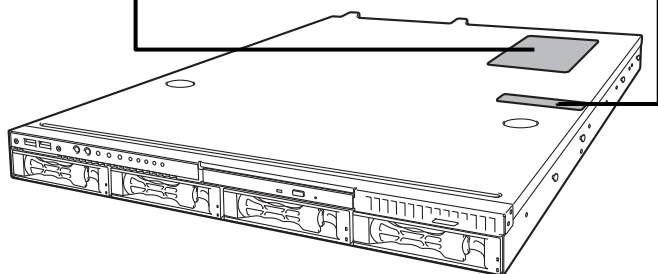


<p>注意：スライドレールに取付けられた装置を棚又は作業台として使用しないで下さい。 CAUTION: Slide rail mounted equipment is not to be used as a shelf or a work space. ATTENTION: L'équipement monté sur rail/glissière ne doit pas être utilisée comme étagère ou aire de travail. 注意：请不要把安装在滑轨上面的设备作为架子或者是工作台使用。</p>
--

3.5-inch drive model

注意 CAUTION ATTENTION	
<p>装置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。 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. 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. 内部的部品可能变得很高温。请注意待其冷却之后再接触。 内部的组件可能变得很高温。请注意待其冷却之后再接触。</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。 Some internal components may still be operational on battery power. Refer to instruction manuals for this system as well as options prior to maintenance. 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. 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。 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，请务必阅读各组件的使用说明书。</p>	⚠
<p>オプションの接続、取り外しはすべての電源プラグをコンセントから抜き、内部装置と接続しているケーブルを外して下さい。 Disconnect all AC power cords from both system and external peripherals prior to installing/removing options. Déconnectez tous les câbles CA du système et des périphériques externes avant d'installer/d'enlever les dispositifs en option. 进行可选配件的安装和拆卸时，请先从插座拔下全部的电源插头并分离与外部设备的所有线缆。 进行选装设备安装和拆卸时，请先从插座拔下全部的电源插头并分离与外部设备的所有线缆。</p>	⚠
<p>ネジは本体内部へ落とさない様、十分に注意下さい。 Do not drop any screws inside the system. Ne laissez tomber aucune vis à l'intérieur du système. 请务必注意不要将螺丝掉入设备内部。 请务必注意不要将螺丝掉入设备内部。</p>	⚠
<p>ボード及びオプション装置の接続の際は、必ずユーザーズガイドを参照し、正しく接続して下さい。 Refer to the "User's Guide" when option board or peripherals are installed. Incorrect installations may result in damage to the system and lead to accidents. 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. 连接板及可选设备时，请务必参照“用户指南”进行正确连接。连接错误，有可能造成故障或火灾。 安装板及可选设备时，请务必参照“用户指南”进行正确连接。连接错误，有可能造成故障或火灾。</p>	⚠
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<p>装置を持ち上げ、移動の際は、底面の足をしっかりと持ち上げて下さい。 Firmly hold the bottom of the system when required to lift and carry the system. Saisissez fermement le fond du système au cas où vous devez soulever et transporter le système. 抬起、移动设备时，请牢固抓住设备底部将其抬起。 抬起、搬運設備時，請牢抓住設備底部將其抬起。</p>	⚠

⚠ 注意：スライドレールに取付けられた装置を棚又は作業台として使用しないで下さい。
CAUTION: Slide rail mounted equipment is not to be used as a shelf or a work space.
ATTENTION: L'équipement monté sur rail/glissière ne doit pas être utilisée comme étagère ou aire de travail.
注意：请不要把安装在滑轨上面的设备作为架子或者是工作台使用。



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 phones 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, see *Chapter 2 (2. Installation and Connection)*.
- If a peripheral device is not plug-and-play device, make sure that the server is off and unplug the power cord before connecting/removing cables to/from the device.
- 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 turning on the server after turning off the server. 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.
- Turn off the server and unplug the power cord before moving it.
- Regularly clean the server to prevent various types of failure. For details, see *Chapter 1 (2. Daily Maintenance)* in "*Maintenance Guide*".
- Momentary voltage drop may occur due to lightning strike. To prevent this, use of UPS is recommended.
- We do not guarantee that the server's optical disk drive will play a copy-protected CD that does not conform to standards.
- In the following cases, check and adjust the system clock before operation.
 - After transportation
 - After storage
 - After the server is used following a period of disuse, in which the storage conditions did not conform to the conditions that guarantee server operations (temperature: 5 to 40°C (when an option is installed: 5 to 45°C(it's subject to composition restrictions.)); humidity: 10% to 85%).
- Check the system clock approximately once per month.
- Keep the following storage conditions.
 - Temperature: -10°C to 55°C, Humidity: 10% to 85% (No condensation of moisture)
- Do not use the server, or removable/backup media such as tape cartridges when moving them from a cold place to a warm place. The condensation will occur and cause malfunctions and failures when these are used in such state. Use the server after waiting sufficiently.
Reference: Time effective at avoiding condensation in winter (5°C or more 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

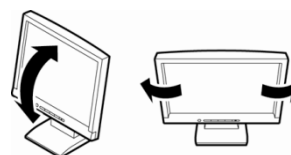
The basic body position for using a computer is sitting straight with your hands on the keyboard parallel with the floor, and your eyes directed slightly downward toward the monitor. With the proper posture described above, no unnecessary strain is applied on any part of your body, in other words when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



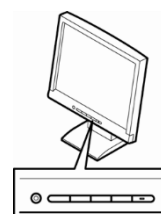
Adjust the angle of your display

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/R110i-1

1

General Description

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

1. Introduction

2. Accessories

Describes the accessories of the server.

3. Features

Describes the features of the server and the server management.

4. Names and Functions of Parts

Describes the name of each part contained in this server.

1. Introduction

Thank you for purchasing this NEC Express5800 Series product.

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

To use the server correctly and to bring out the server's performance, read this document carefully.

2. Accessories

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

- Tool for Removing Slide Rails (outer rails)
- Cable Ties (for securing AC power cord)
- SDR Update CD-ROM
- Power Cord
- Front Bezel
- Getting Started
- Safety Precautions and Regulatory Notices

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 / Pentium processor
- High-speed memory access (DDR4L 2400 supported)
- High-speed disk access (SATA2 6 Gbps, SAS 12 Gbps supported)
- High-speed 1000BASE-T (2 ports + 1port(for management)) interface (1Gbps/100Mbps/10Mbps supported)

High reliability

- Memory monitoring feature (error correction/error detection)
- Memory degeneracy feature (logical isolation of a failed device)
- Bus parity error detection
- Temperature detection
- Error detection
- Internal fan monitoring feature
- Internal voltage monitoring feature
- RAID system (disk array)
- Auto rebuild feature (hot swapping supported)
- BIOS password feature
- The security lock that comes with Front Bezel
- Redundant Fan (optional)
- Redundant Power Unit

Management Utilities

- NEC ESMPRO
- ExpressUpdate
- Remote controlling feature (EXPRESSSCOPE Engine 3)
- RAID system management utility (Universal RAID Utility)
- Hard disk drive monitoring

Power saving and noiseless design

- Power monitoring feature
- Power control feature
- 80 PLUS Platinum certified high efficiency power supply unit (for non-redundant power supply)
- 80 PLUS Gold certified high efficiency power supply unit (for redundant power supply)
- Fan control appropriate to environment, work load, and configuration
- Enhanced Intel SpeedStep Technology supported

Expandability

- PCI Express 3.0 (x16 lanes): 1 slot (low profile)
- PCI Express 3.0 (x4 lanes): 1 slot (low profile)
- PCI Express 3.0 (x4 lanes): 1 slot (low profile, RAID controller exclusive use)
- Large capacity memory of up to 64 GB
- Hard disk drive bay
 - 2.5-inch drive model: Standard 8 slots
 - 3.5-inch drive model: 4 slots
- Optical disk drive bay provided as standard
- USB3.0 interface (requires the supporting OS)
- Three LAN ports (one for management LAN)

Ready to use

- Hard disk drives can be installed with one-touch setup, which requires no cables (hot swap supported)

Various built-in Features

- 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
- Baseboard Management Controller (BMC) conforming to IPMI v2.0

Self-diagnosis

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

Easy setup

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

Maintenance features

- Off-line tools
- Memory dump feature using the DUMP switch
- Feature to back up and restore BIOS/BMC settings using the EXPRESSSCOPE profile key

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

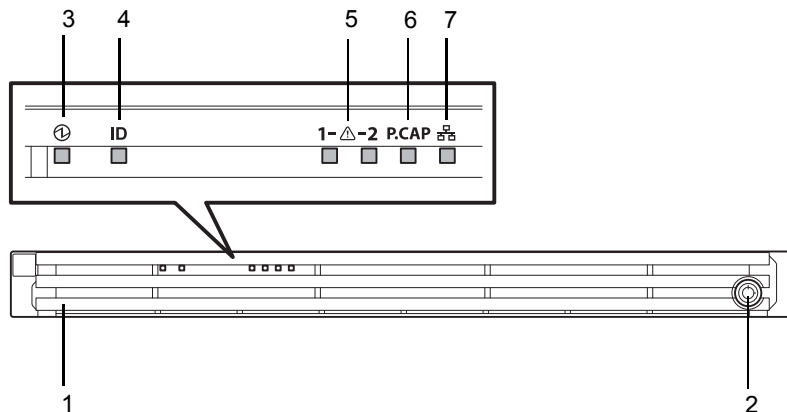
You can manage the version of firmware or software on the server and update them with an update package by using NEC ESMPRO Manager and ExpressUpdate Agent.

This feature automatically updates multiple packages without stopping the system by using NEC ESMPRO Manager.

4. Names and Functions of Parts

This section describes the names of the server parts.

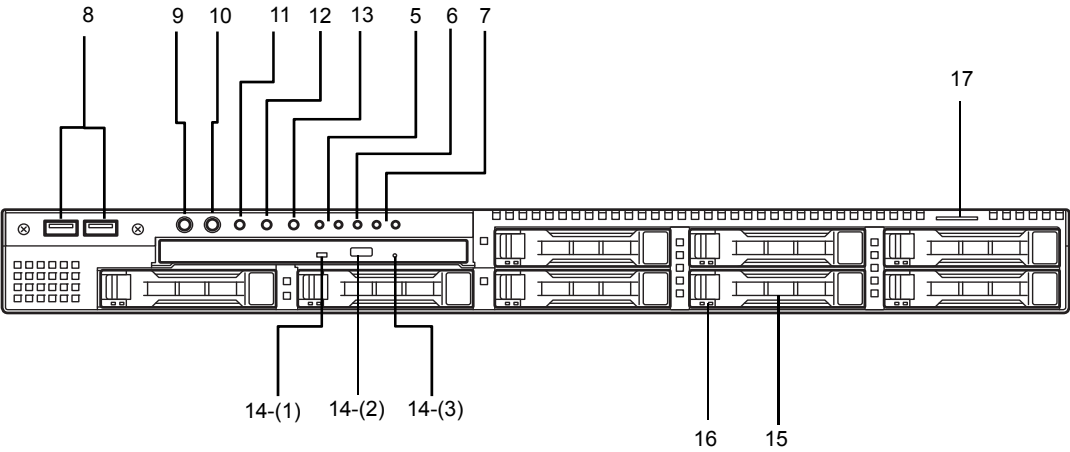
4.1 Front View (With Front Bezel)



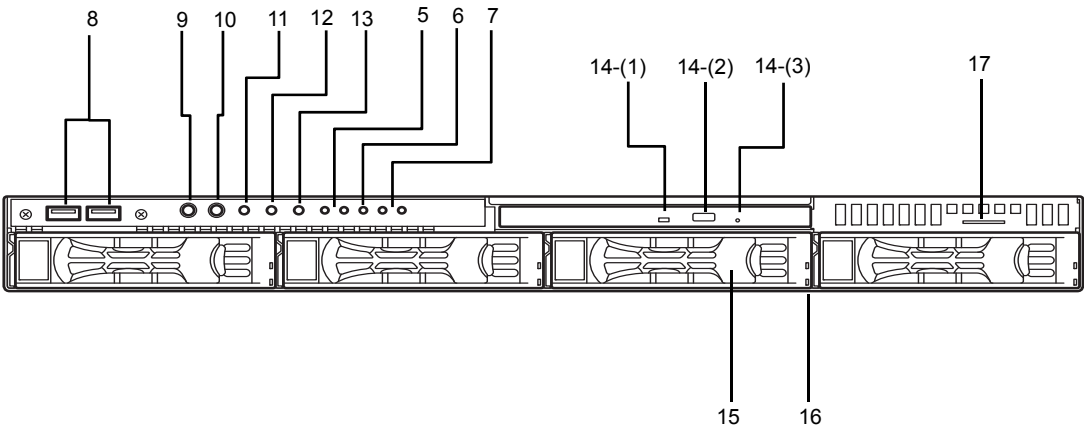
- | | |
|--|---|
| <p>1 Front Bezel
A cover to protect the front of the server. This cover can be locked with the provided Bezel Lock Key.</p> <p>2 Key Slot
A slot for Bezel Lock Key that is used to lock Front Bezel.</p> <p>3 POWER LED (green/amber)
An LED for showing the power status of the server.
(See page 32)</p> <p>4 Unit ID (UID) LED
An LED for maintaining the server. This LED turns on when the UID switch is pressed. Commands from the software also cause it to turn on or flash</p> | <p>5 STATUS LED
An LED for showing the server status.
(See page 32)</p> <p>6 Power Capping LED
An LED for showing the power capping status of the server.
(See page 34)</p> <p>7 LINK/ACT LED
LEDs for showing the status of accessing to the network.
(See page 33)</p> |
|--|---|

4.2 Front View (Without Front Bezel)

2.5-inch drive model



3.5-inch drive model



8 USB Connectors (front)

Connectors for connecting USB interface devices.

9 POWER Switch/LED

A switch for turning on/off the server. Press once to turn on the server. POWER LED lights green 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.

10 Unit ID (UID) Switch/LED

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

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

11 RESET Switch

A switch for resetting the server.

12 DUMP Switch (NMI)

A switch for collecting the memory dump.

13 BMC RESET Switch

A switch for resetting BMC of the 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 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

14 – (1) Access LED for optical disk

14 – (2) Eject button

14 – (3) Eject hole

15 2.5-inch/3.5-inch Hard Disk Drive Bay

Bays for installing HDDs. The sequential numbers indicate the corresponding slot numbers. All bays include dummy trays.

16 DISK LED (green/amber)

LEDs for showing each hard disk drive status.

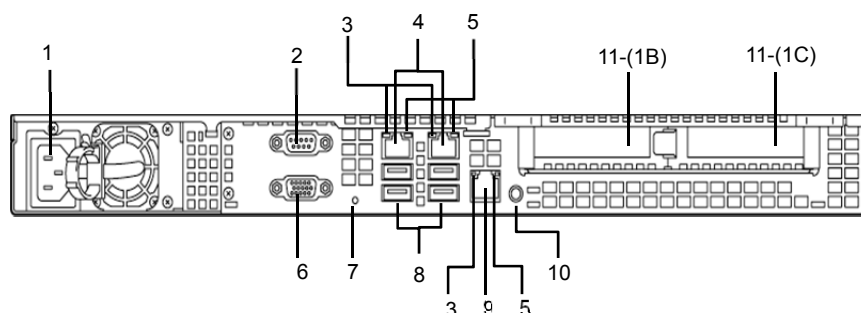
This LED light turns green when a hard disk drive is being accessed. The light turns amber if a hard disk drive is broken and it blinks green and amber alternately when a hard disk drive is being rebuilt in the RAID system

17 Pull-out Tab

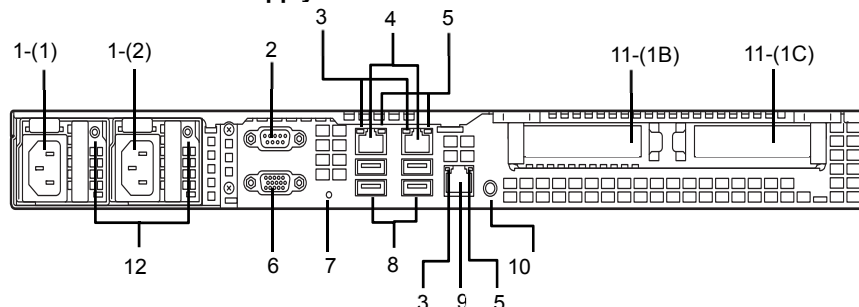
A tab for showing the model number and serial number of the server.

4.3 Rear View

<Non-Redundant Power Supply Unit Model>



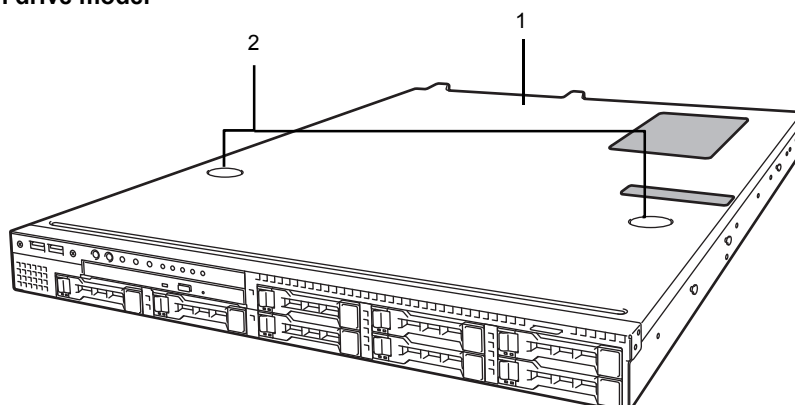
<Redundant Power Supply Unit Model>



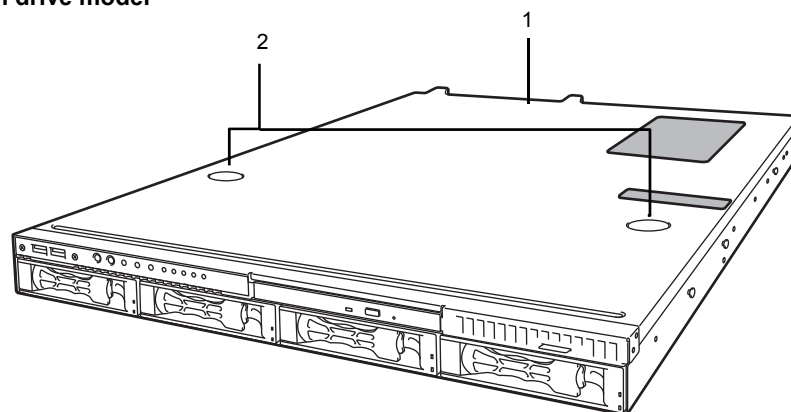
- | | |
|--|---|
| <p>1 AC Inlet
Sockets for connecting power cords.
The sequential numbers indicate the corresponding slot numbers.</p> <p>2 Serial Port A (COM A) Connector
A connector for connecting serial interface devices.
This cannot directly connect to a network line.</p> <p>3 LINK/ACT LED (green)
LEDs for showing the access status of LAN.</p> <p>4 LAN Connectors
Connectors for connecting to a network (1000BASE-T/100BASE-TX /10BASE-T).
If Shared BMC LAN feature is enabled in ROM Utility, LAN1 connector can also be used as the management LAN connector. Sharing port is not recommended from the viewpoint of performance and security.</p> <p>5 SPEED LED (green/amber)
LEDs for showing the transfer speed of LAN ports.</p> <p>6 Display Connector
A connector for connecting a display.</p> | <p>7 DC Power LED (green)
A LED for showing DC power status. The LED lights amber during BMC initialization. The LED lights green when the power is ON.</p> <p>8 USB Connectors
Connectors for connecting USB3.0 interface devices.</p> <p>9 Management LAN Connector
A LAN connector (1000BASE-T/100BASE-TX /10BASE-T) for connecting EXPRESSSCOPE Engine 3.
This connector cannot be used as a normal LAN port. This port cannot be used when Shared BMC LAN feature is used.</p> <p>10 UID (Unit ID) Switch/LED (blue)
A switch for turning on/off UID LED. Pressing the switch once turns on the UID LED and pressing once more turns off the LED.</p> <p>11 PCI Slot
Slots for installing low profile PCI cards. The sequential numbers indicate the corresponding slot numbers.</p> <p>12 AC Power LED
A LED for showing AC power status.</p> |
|--|---|

4.4 External View

2.5-inch drive model



3.5-inch drive model

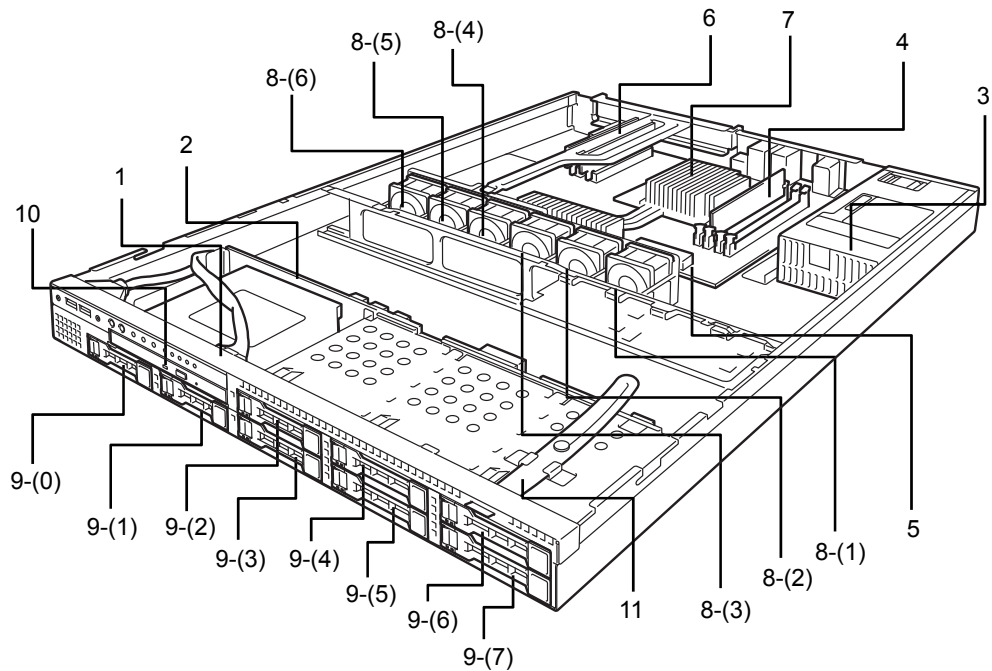


- 1 Top Cover
- 2 Release Button

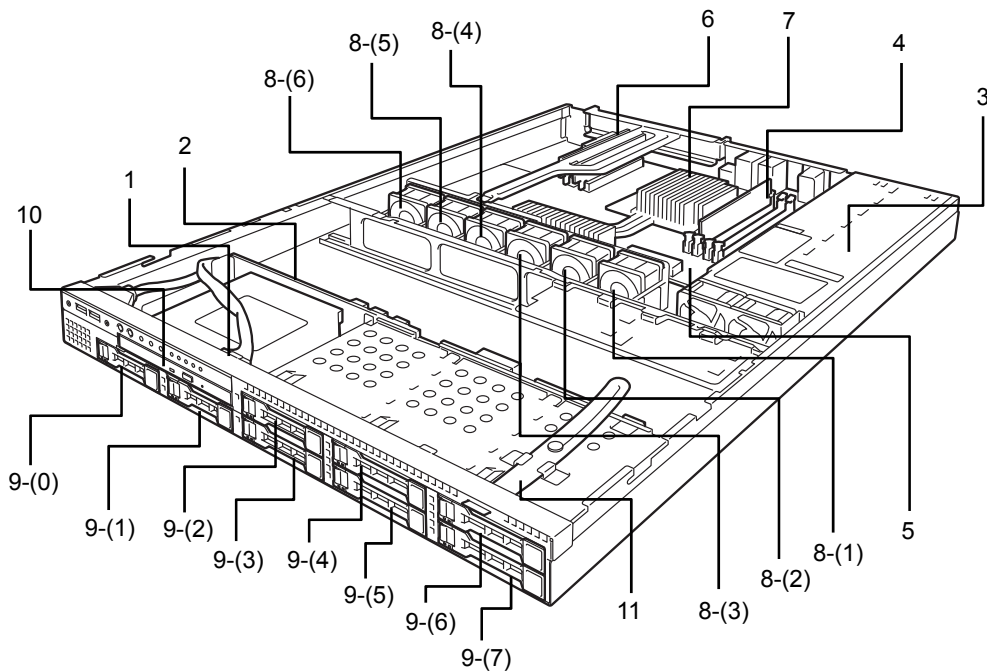
4.5 Internal View

The images below do not show the duct.

2.5-inch drive model (non-redundant fan / non-redundant power supply)



- | | |
|---|---|
| 1 Front Panel Board | 8 Cooling Fan |
| 2 Backplane | - (1) BPB_FAN1 |
| 3 Power Supply Unit | - (2) BPB_FAN3 |
| 4 DIMM (optional) | - (3) BPB_FAN5 |
| 5 Motherboard | - (4) BPB_FAN7 |
| 6 PCI Riser Card | - (5) BPB_FAN9 |
| 7 Processor (attached under the heat sink) | - (6) BPB_FAN11 |
| | 9 2.5-inch Hard Disk Drive Bay |
| | The sequential numbers indicate the corresponding slot numbers. |
| | 10 Optical Disk Drive (optional) |
| | 11 Pull-out Tab |

2.5-inch drive model (redundant fan / redundant power supply)**1 Front Panel Board****2 Backplane****3 Power Supply Unit****4 DIMM (optional)****5 Motherboard****6 PCI Riser Card****7 Processor (attached under the heat sink)****8 Cooling Fan**

-(1) BPB_FAN1, BPB_FAN2

-(2) BPB_FAN3, BPB_FAN4

-(3) BPB_FAN5, BPB_FAN6

-(4) BPB_FAN7, BPB_FAN8

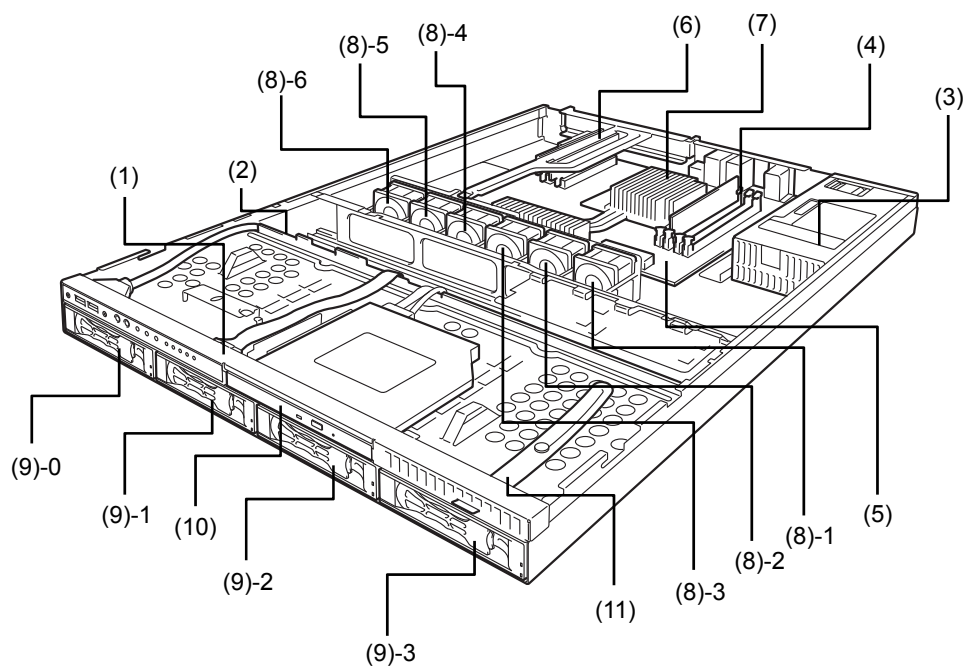
-(5) BPB_FAN9, BPB_FAN10

-(6) BPB_FAN11, BPB_FAN12

9 2.5-inch Hard Disk Drive Bay

The sequential numbers indicate the corresponding slot numbers.

10 Optical Disk Drive (optional)**11 Pull-out Tab**

3.5-inch drive model (non-redundant fan / non-redundant power supply model)**(1) Front Panel Board****(2) Backplane****(3) Power Supply Unit****(4) DIMM (optional)****(5) Motherboard****(6) PCI Riser Card****(7) Processor (attached under the heat sink)****(8) Cooling Fan**

-1 BPB_FAN1

-2 BPB_FAN3

-3 BPB_FAN5

-4 BPB_FAN7

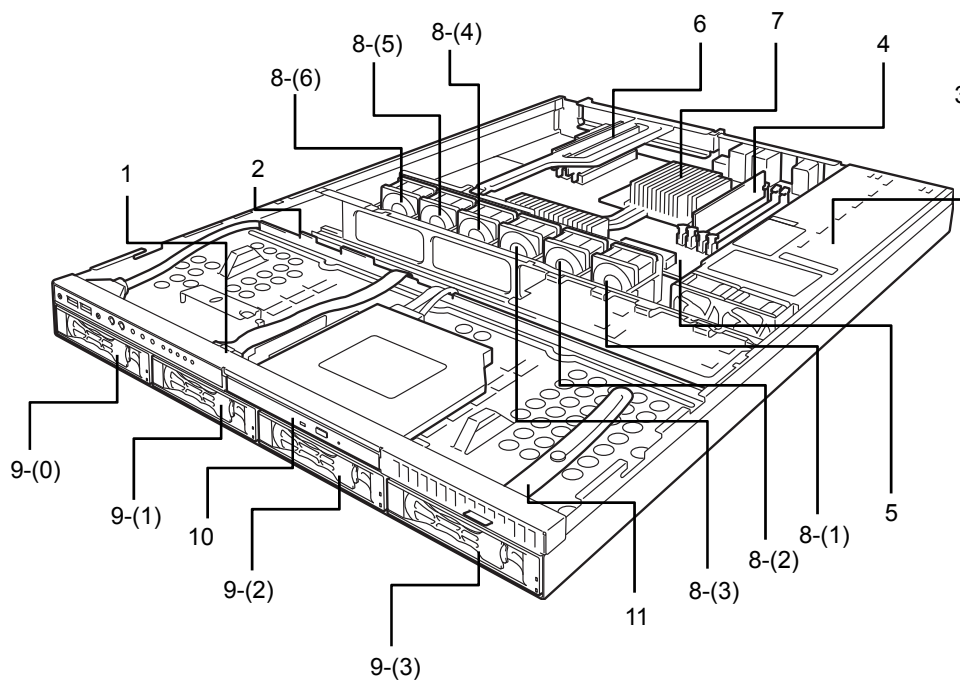
-5 BPB_FAN9

-6 BPB_FAN11

(9) 3.5-inch Hard Disk Drive Bay

The sequential numbers indicate the corresponding slot numbers.

(10) Optical Disk Drive (optional)**(11) Pull-out Tab**

3.5-inch drive model (redundant fan / redundant power supply model)**1 Front Panel Board****2 Backplane****3 Power Supply Unit****4 DIMM (optional)****5 Motherboard****6 PCI Riser Card****7 Processor (attached under the heat sink)****8 Cooling Fan**

-(1) BPB_FAN1, BPB_FAN2

-(2) BPB_FAN3, BPB_FAN4

-(3) BPB_FAN5, BPB_FAN6

-(4) BPB_FAN7, BPB_FAN8

-(5) BPB_FAN9, BPB_FAN10

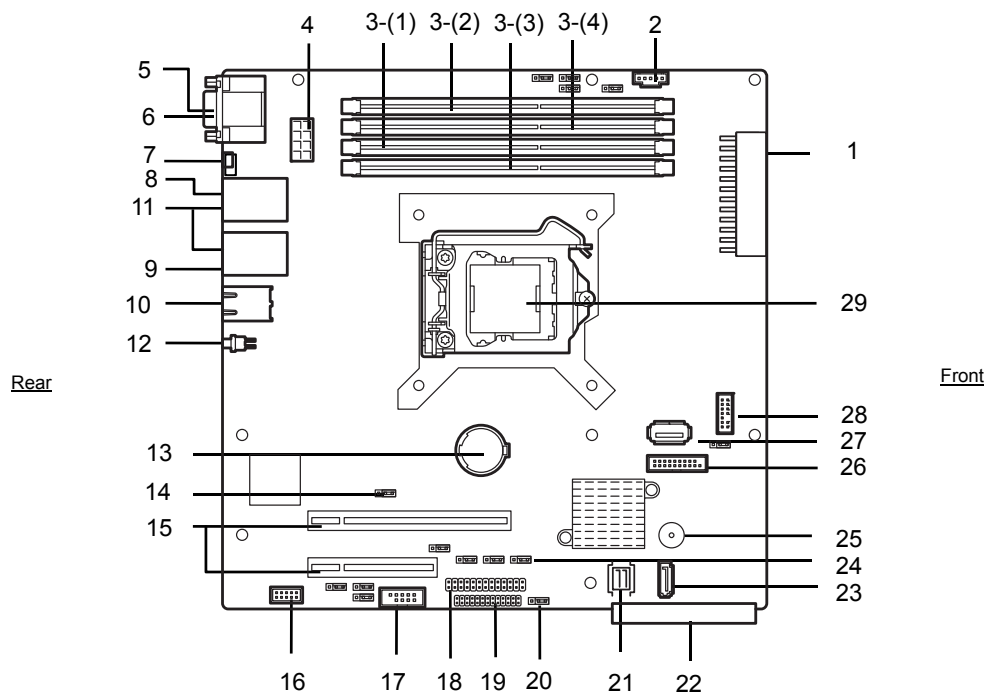
-(6) BPB_FAN11, BPB_FAN12

9 3.5-inch Hard Disk Drive Bay

The sequential numbers indicate the corresponding slot numbers.

10 Optical Disk Drive (optional)**11 Pull-out Tab**

4.6 Motherboard



- 1 Power Connector**
- 2 PM-BUS Connector**
- 3 DIMM Slots**
(the number after hyphen indicates slot number)
- 4 Power Connector (CPU)**
- 5 Serial Port (COM A) Connector**
- 6 VGA Connector**
- 7 Power LED (rear)**
- 8 LAN1 Connector**
- 9 LAN2 Connector**
- 10 LAN Connector for Management**
- 11 USB Connector (rear)**
- 12 UID Switch (rear)**
- 13 Lithium Battery**
- 14 Clear CMOS Jumper**
- 15 PCI Riser Card Connector (dedicated to low profile cards)**

For the supported PCI card specifications, see *Chapter 2 (1.10 PCI Card)*.

- 16 SPI Flash Mezzanine Connector**
EXPRESSSCOPE profile key (SPI memory) has been installed, where BIOS and BMC configuration data is stored. Move it when replacing MB to keep using the data.
- 17 Serial Port (COM B) Connector**
- 18 Front Panel Connector**
- 19 HDD BP Connector**
- 20 Clear Password Jumper**
- 21 SAS/SATA Connector (HDD BP)**
- 22 PCI 1A slot Connector**
- 23 Serial ATA Connector (DVD)**
- 24 RAID Configuration Jumper**
- 25 Buzzer**
- 26 USB Connector (front)**
- 27 Internal USB Connector**
- 28 TPM Kit Connector**
- 29 Processor (CPU) Socket**

* Only the connectors used for server upgrades and maintenance (such as replacing parts) are listed here. Use other connectors or parts without any change.

4.7 Indicators

This section explains the meanings of LEDs.

4.7.1 POWER LED (🔌)

POWER LED indicates the 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 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 is complete.
Blinking (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.
		A correctable memory error has often occurred.	
		Operating while CPU error is detected.	
Off	Off	In redundant power configuration, power is not supplied to either of power unit.	Turn on the server. Wait for a while. STATUS LED will turn green after POST completes. 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. Wait until the memory dump is completed.
		The power is off.	
		POST is in progress.	
		Watchdog timer expired.	
Off	Off	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.	
		Sensor error was detected.	
		A CPU temperature alarm was detected.	
Off	Blinking (amber)	An error occurred on Intel Node Manager (one of the features of EXPRESSSCOPE Engine 3).	
		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 (Only RAID system configuration).	

4.7.3 LINK/ACT LED (🔌1, 🔌2)

LINK/ACT LED at the front of the server lights green when it is connecting to LAN and blinks when transmitting or receiving data on LAN. The number next to the icon indicates a LAN port number.

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

4.7.4 Optical Disk Access LED

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)

The UID LED is provided one each at the front and rear of the server. This LED is used to identify the target server among multiple servers installed in a rack.

UID LED pattern	Description
On (blue)	UID Switch is on. UID LED turns off when UID Switch is pressed again.
Blinking (blue)	The server is received the command from the management software.
Off	UID Switch is off.

4.7.6 Power Capping LED(P.CAP)

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

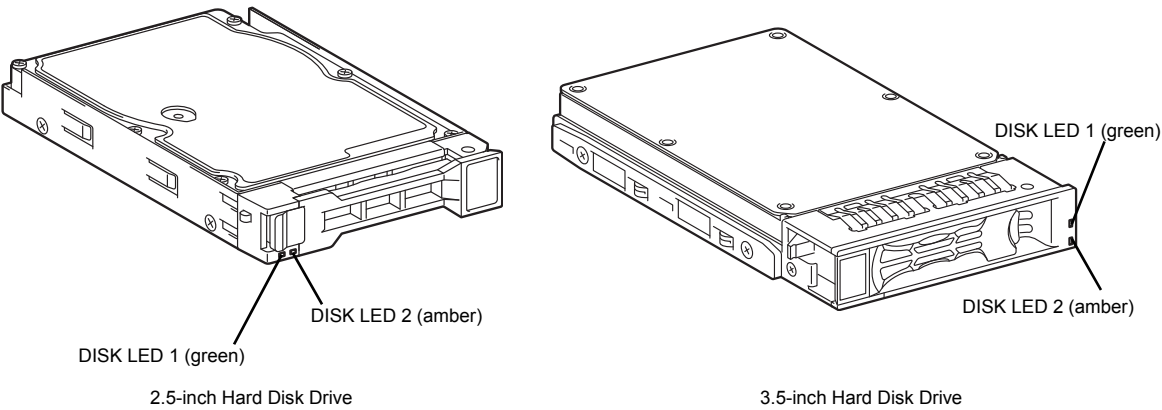
Power Capping LED pattern	Description
On (green)	Power Capping feature is enabled.
Blinking (green)	Power Capping is enabled and power control (capping) is working.
Off	Power Capping feature is disabled.

Note

The Power Capping LED seems to be lit or blinking amber when STATUS LED is lit or blinking 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	Action
DISK LED 1	DISK LED 2		
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.	—

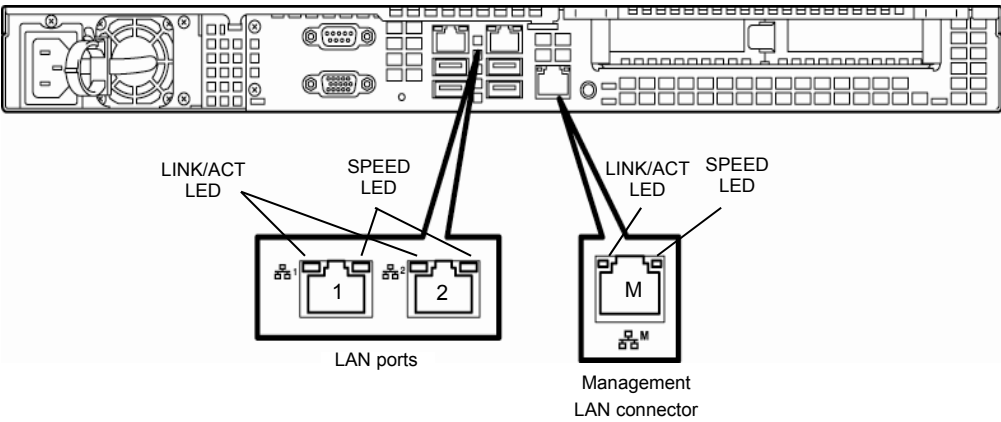
Important

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.

4.7.8 LEDs for LAN connectors

The three LAN connectors provided at the rear of the server have two LEDs each.



• LINK/ACT LED

This LED indicates the state of the LAN port.

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

• SPEED LED

This LED indicates which network interface is used.

- Two onboard LANs (1, 2) support 1000BASE-T, 100BASE-TX, and 10BASE-T.
- Management LAN (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

If an optional redundant power supply unit is installed, an AC POWER LED is added to the unit.

LED status	Condition	Description
On (green)	The server is on.	—
Blinking (green)	AC power is being supplied via the power cord.	—
On (amber)	A redundant power supply system is configured and a power cord is only connected to one of the power supply units.	Connect the power cord to the other power supply unit.
	The power supply unit detects abnormality and stops because safety.	Contact your sales representative.
Blinking (amber)	The power supply unit is detecting an omen of an abnormal.	
Off	The power is not supplied to the server.	Connect the power cable. If the LED is not lit although power cord is connected, contact your sales representative.

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 did not purchase any optional devices.

2. Installation and Connection

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

1. Installing Internal Optional Devices



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



Important

If use the third party optional device to the server, and it causes failure, a charge for repairing must be paid 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	
	<p>Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, refer to <i>Safety Precautions and Regulatory Notices</i>.</p> <ul style="list-style-type: none"> • 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	
	<p>Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to <i>Safety Precautions and Regulatory Notices</i>.</p> <ul style="list-style-type: none"> • Do not drop • Do not leave the server being pulled out. • Make sure to complete installation. • Do not install with the cover removed. • Do not get your fingers caught. • High temperature • Electrical shock

1.2 Overview of Installation and Removal

Install/remove components by using the following procedure.

The internal components except for hard disk drives must be installed or removed after dismounting the server from the rack. See *Chapter 2 (2. Installation and Connection)* for details.



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

- Do not 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 UID Switch to identify the target server.
See *Chapter 2 (1.3 Confirming Servers (UID Switch))*.
2. Remove the front bezel.
See *Chapter 2 (1.4 Removing the Front Bezel)*.
3. Turn off the server.
See *Chapter 3 (6. Turning off the Server)*.
4. Disconnect the power cord from the outlet and the server.

Important

After disconnecting the power cord from the server, wait for at least 5 seconds before continuing to work because the components on the motherboard might still be operating for 3 to 4 seconds even after the power cord was disconnected.

5. When installing or removing DIMMs, TPM Kits, PCI cards, redundant fans, optical disk drives, redundant power supply unit, and Flash Backup Units for RAID Controller, dismount the server from the rack and place it on a flat and hard desk.
See *Chapter 2 (2.1.2 Installing the server to the rack or removing it from the rack – (2) Removal procedure)*.
If installing only additional hard disk drives, go to step 11.

Important

Do not leave the server open on the rack.

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

7. Depending on the components to be installed or removed, follow the procedure in order.
See *Chapter 2 (1.6 TPM Kit to 1.14 2.5-inch Hard Disk Drive)*.
8. Connect cables.
See *Chapter 2 (1.8.1 Connecting cables)*.
9. Attach the top cover.
See *Chapter 2 (1.15 Attaching the Top Cover)*.
10. Mount the server onto the rack.
See *Chapter 2 (2.1.2 (1) Installation)*.
11. Install hard disk drives.
See *Chapter 2 (1.13 3.5-inch Hard Disk Drive or 1.14 2.5-inch Hard Disk Drive)*.
12. Attach the front bezel.
See *Chapter 2 (1.16 Attaching the Front Bezel)*.

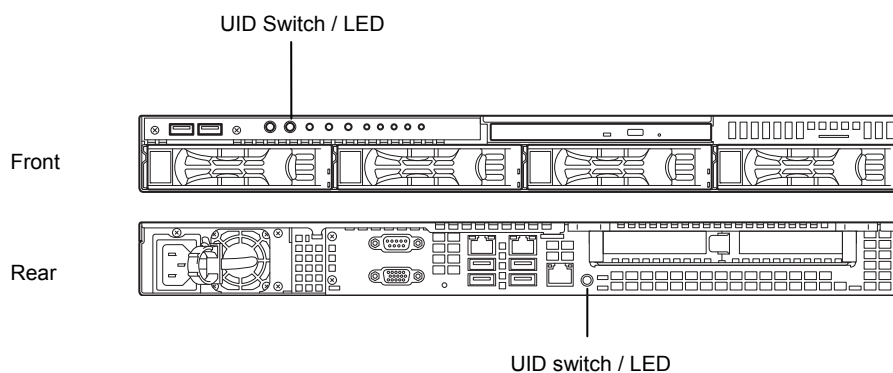
Continue the setup with reference to *Chapter 2 (2.2 Connection)*.

1.3 Confirming Servers (UID Switch)

Using UID Switch helps you to identify the target server.

When the server is working, **be sure to identify the target server by using UID Switch first.**

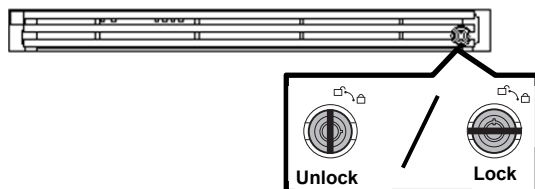
When UID Switch is pressed, UID LED lights blue. When it is pressed again, the LED is unlit.



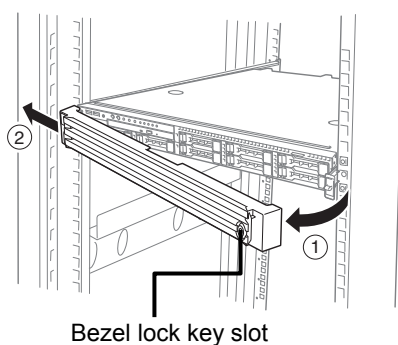
1.4 Removing the Front Bezel

Remove the front bezel when turning the server on or off, or handling an optical disk drive.

1. Unlock the front bezel by using the attached bezel lock key.



2. Hold the right end of the front bezel carefully to pull it toward you.
3. Slide the front bezel to the left a little to release the tab from the frame and then remove the front bezel from the server.



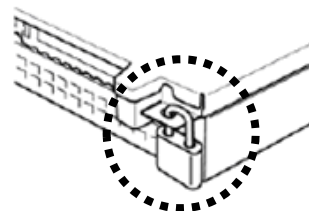
1.5 Removing the Top Cover

To install/remove the internal optional parts or change the internal cable connection, remove the top cover.

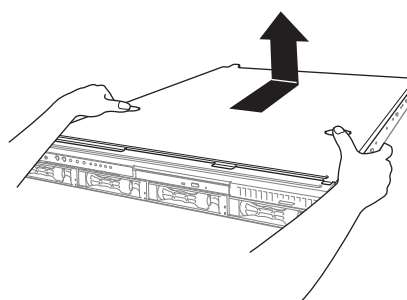
Important

Remove the cable connected to the PCI board such as a LAN board first when removing the top cover. Failure to do so may damage the cable.

1. Unlock the chassis, if necessary.
2. Slide back the top cover while pressing its release button.

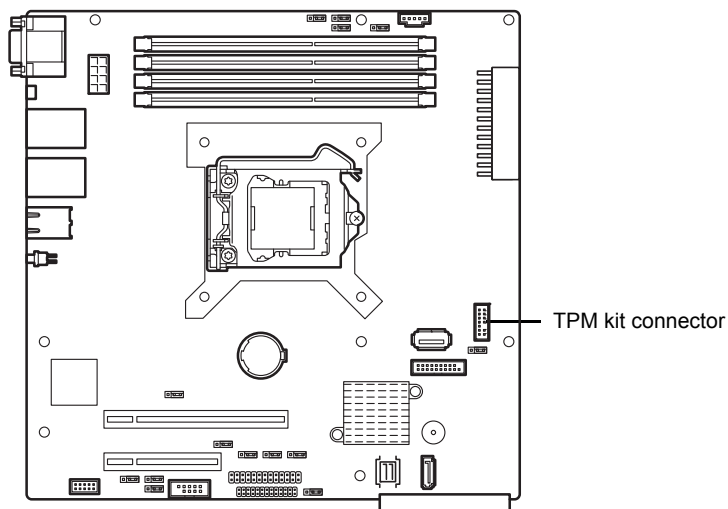


3. Lift the top cover off the server.



1.6 TPM Kit

This section describes the procedure for installing optional TPM Kit.



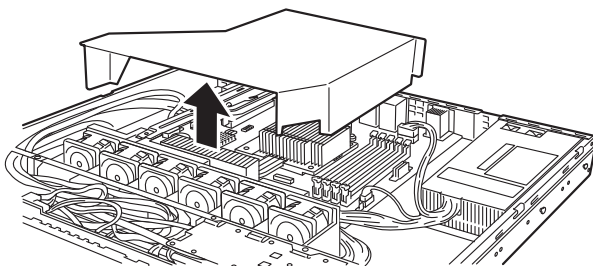
1.6.1 Installation

Install the TPM Kit in accordance with the following procedure.

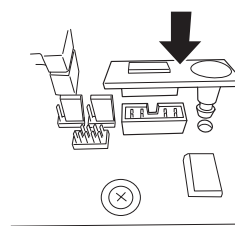
Note

The TPM kit once installed cannot be removed.

1. See steps 1 to 6 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Lift the air duct and remove it.



3. Install the TPM Kit and secure it by pushing the nylon rivet provided with the TPM Kit.



1.7 DIMM

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

- Important**
- To avoid static electricity, see *Chapter 1 (1.8 Anti-static Measures) in .Safety Precautions and Regulatory Notices.*
 - Use only the DIMMs provided by NEC.

Tips Up to 32 GB (8 GB × 4) of memory can be installed.

The server supports 2-way interleaved memory system.

In 2-way interleaved memory system, the data transfer rate of the memory is twice that of a non-interleaved memory system.

1.7.1 Maximum supported memory size

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

A list of maximum memory sizes

OS	The maximum memory size supported on each OS	The maximum memory size supported on the server
Windows Server 2008 R2 Standard (x64)	32 GB	32 GB
Windows Server 2008 R2 Enterprise	2 TB	64 GB
Windows Server 2012 Standard	4 TB	
Windows Server 2012 Datacenter		
Windows Server 2012 R2 Standard		
Windows Server 2012 R2 Datacenter		
Windows Server 2016 Standard	24 TB	
Windows Server 2016 Datacenter		
VMware ESXi 6.0 Update3	6 TB	64 GB Up to 4 TB of the main memory is available to each virtual machine.
VMware ESXi 6.5 Later	12 TB	64 GB Up to 6 TB of the main memory is available to each virtual machine.

1.7.2 DIMM installation order

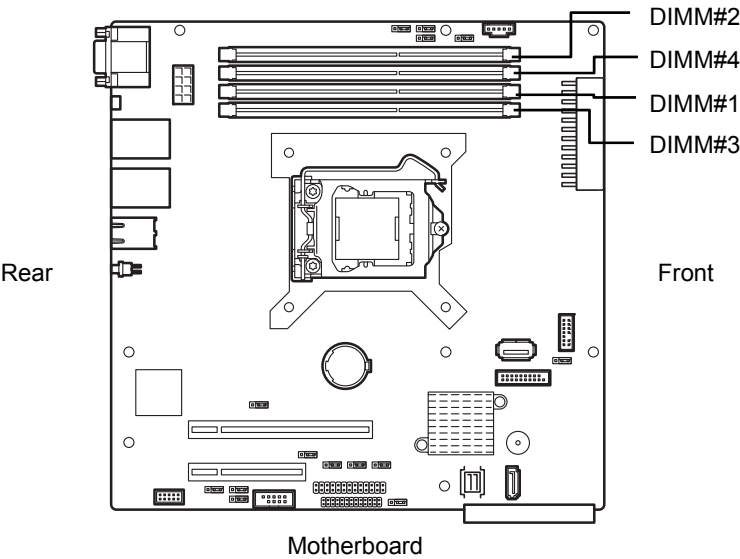
Install DIMMs one by one in order of increasing memory size into slots in the order of DIMM#1, DIMM#2, DIMM#3, and DIMM#4.

If you want to run the server in 2Way Interleave mode, observe the following installation rules:

- Install them in pairs
- The two DIMMs installed together must be of the same specifications and memory size.
- Install the pairs as DIMM#1 and DIMM#2, or DIMM#3 and DIMM#4. The installation order between the pairs does not matter.

Installation examples

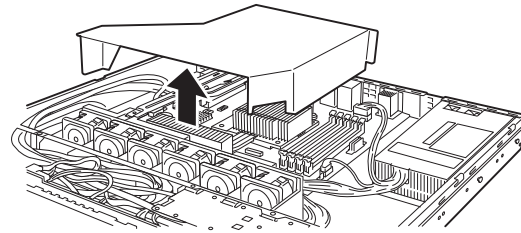
Example	2Way Interleave	DIMM#1	DIMM#2	DIMM#3	DIMM#4
1	Available	4 GB DIMM	4 GB DIMM	Not installed	Not installed
2	Available	4 GB DIMM	4 GB DIMM	4 GB DIMM	4 GB DIMM
3	Not available	4 GB DIMM	4 GB DIMM	4 GB DIMM	Not installed
4	Not available	4 GB DIMM	4 GB DIMM	Not installed	4 GB DIMM



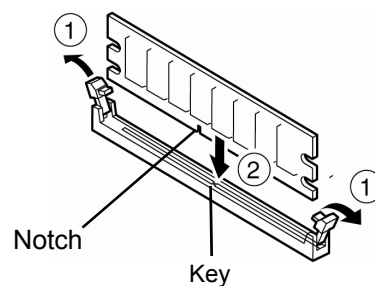
1.7.3 Installation

Install a DIMM by using the following procedure.

1. See steps 1 to 4 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Lift the duct off the server.



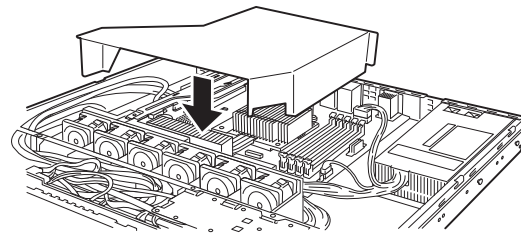
3. Open both levers of the target DIMM slot outward and push the DIMM straight into the socket.
When the DIMM is inserted correctly, the lever automatically closes.



Important

- Align the notch on the DIMM with the key on the slot.
- Do not apply too much pressure when you push a DIMM into the socket.

4. Attach the duct.



5. Assemble the server.
6. Turn on the server and 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".
7. Run the BIOS Setup Utility. On the **Advanced** menu, choose **Memory Configuration, Memory Information**. Make sure the capacity of added DIMM is displayed properly.
See *Chapter 2 (1. System BIOS)* in "Maintenance Guide".
8. On the **Advanced** menu, choose **Memory Configuration, Memory Retest** and then specify **Yes**.
Choose **Save Changes and Exit** to restart.
9. Set the paging file size to the recommended value (Total memory size x 1.5) or more.
When using a Windows OS, see *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "Installation Guide (Windows)".
For other OS, see the manual provided with the operating system or contact your sales representative.

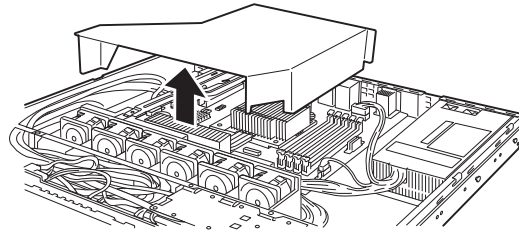
1.7.4 Removal

Remove a DIMM in the following procedure.

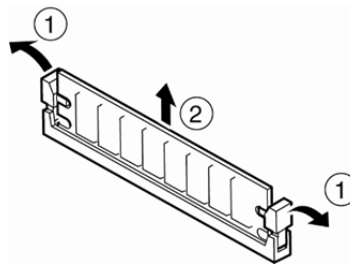
Note

- 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 4 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Lift the duct off the server.



3. Open both levers of DIMM slot to unlock DIMM.
4. Remove DIMM by pulling it up straight.



5. Assemble the server.
6. Turn on the server and 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".
7. Run the BIOS Setup Utility. On the **Advanced** menu, choose **Memory Configuration, Memory Retest** and then specify **Yes**. Choose **Save Changes and Exit** to restart.
8. Set the paging file size to the recommended value (Total memory size x 1.5) or more.
When using a Windows OS, see *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "Installation Guide (Windows)".
For other OS, see the manual provided with the operating system or contact your sales representative.

1.8 Jumper Settings and Cable Connections Based on Internal Hard Disk Drive Configuration

This section describes the jumper settings and cable connections when using hard disk drives installed in HDD cages in a non-RAID System or RAID System.

Important If you use hard disk drives in the RAID system or change the RAID level, initialize the hard disk drives. If the hard disk drive contains valuable data, be sure to backup the hard disk drive before installing the RAID controller and configuring the RAID system.

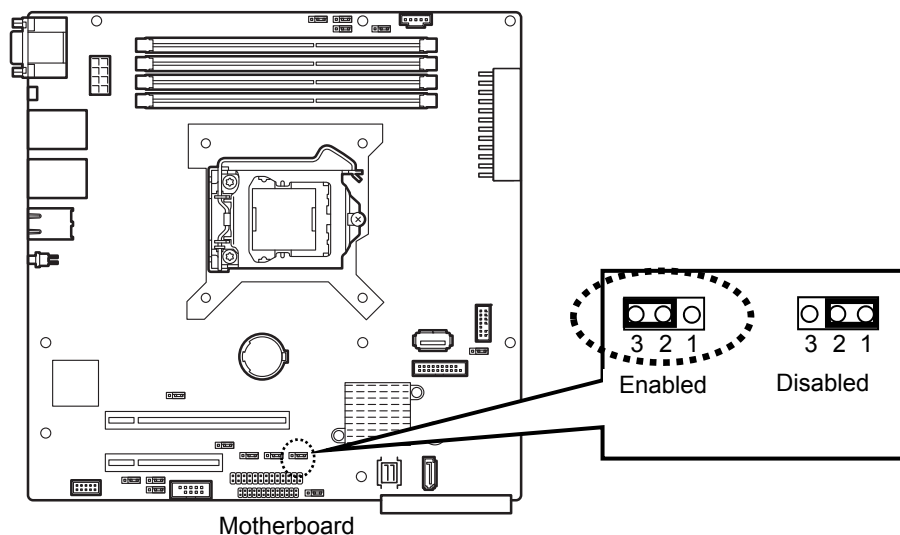
Note In the RAID system, use hard disk drives that have the same specifications (capacity, rotational speed, and standard) for each disk array.

Tips Logical drives can be created even with only one physical device.

Set the jumper on the motherboard according to your system, as shown below.

- (a) **Using the Software RAID (SW RAID)**
Enable SW RAID by changing jumper setting on motherboard.

Jumper on motherboard (SWRAID)
Change jumper setting to 2-3 (Enabled).



When not using Software RAID (SWRAID), jumper setting to 1-2 (Disabled).

(b) Using an optional RAID controller**Note**

When installing an optional RAID controller, start the BIOS Setup utility, select **PCI Configuration** from the **Advanced** menu, and then make sure that the parameter of **PCI Slot xx ROM** (xx is PCI slot number) is set to **Enabled**.

Important

Do not change the mode to hibernate when building a RAID system.

(c) Installation

For the instruction of installing the optional RAID controller, see *Chapter 2 (1.10 PCI Card)*.

(d) Removal

To remove the optional RAID controller, reverse the installation procedure.

If you intend to use with the card removed, be sure to attach the blank cover attached to the riser card.

Important

- To avoid static electricity, see *Chapter 1 (1.8 Anti-static Measures) in Safety Precautions and Regulatory Notices*.
- Do not change the mode to hibernate when building a RAID System.
- To install the SAS hard disk drive together with SATA hard disk drive, there are some conditions to be met. See *Chapter 2 (1.8.2 Notes on setting up a RAID System)*.

Tips

When using SAS hard disk drives, install a RAID controller to the server.

Note

- When installing an optional RAID Controller, start the BIOS Setup utility, select **PCI Configuration** from the **Advanced** menu, and then make sure that the parameter of **PCI Slot xx ROM** (xx is PCI slot number) is set to **Enabled**.
- When connecting a RAID controller, 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.

1.8.1 Connecting cables

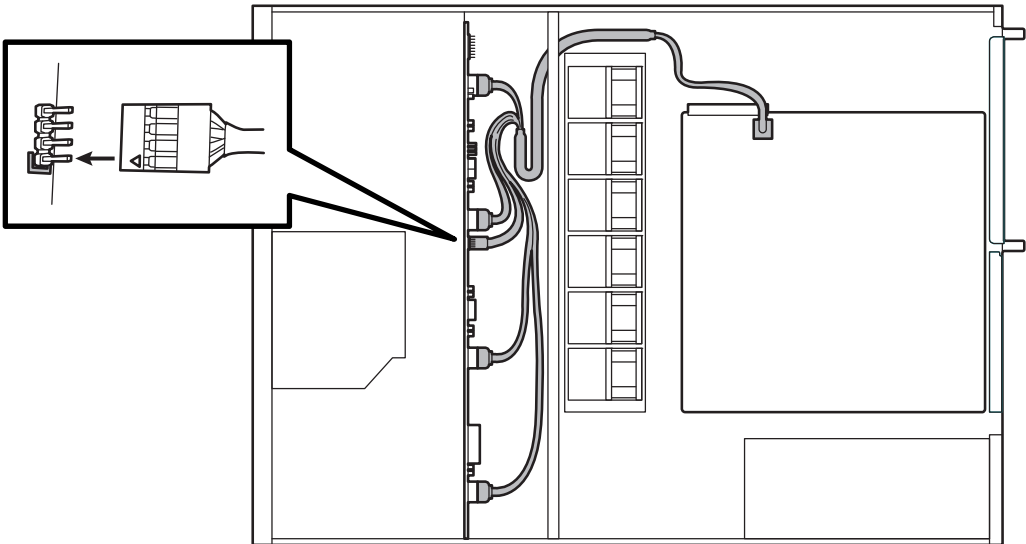
To use an on-board controller or optional RAID controller, connect the interface cable. See the figures below for how to connect cables.

Important Both SAS hard disk drives and SATA hard disk drives cannot be installed.

Tips When using SAS hard disk drives, install a RAID controller to the server.

Using the on-board controller for a 3.5-inch drive model

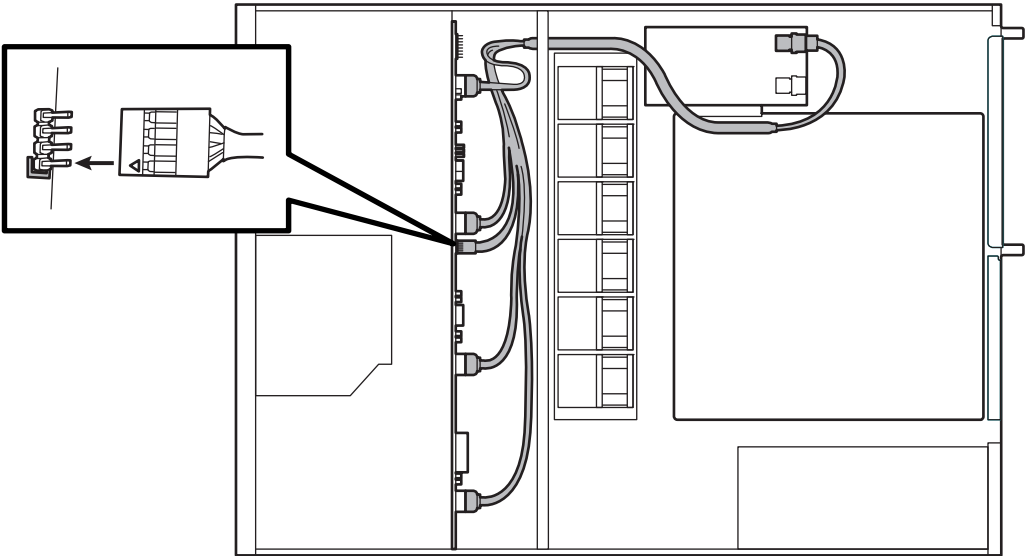
- Using the built-in SAS/SATA cable by which standards are attached to the server.
- Connect the 0 to 3 connectors of the built-in SAS/SATA cable to the SATA0 to SATA3 connectors on the backplane, respectively.
- While matching the pin 1 (indicated by the triangleΔ) of the S1 and the pin 1 (indicated by the bold line) of the CON803, connect the S1 connector of the built-in SAS/SATA cable to the CON803 connector on the backplane.
- Connect the miniSASHD connector of the built-in SAS/SATA cable to the MINISAS_HD connector on the motherboard.



Motherboard	Hard disk drive	Backplane
MINISAS_HD	SLOT 0	SATA 0
	SLOT 1	SATA 1
	SLOT 2	SATA 2
	SLOT 3	SATA 3

Using optional RAID controller for a 3.5-inch drive model

- Using the built-in SAS/SATA cable by which standards are attached to the server.
- Connect the 0 to 3 connectors of the built-in SAS/SATA cable to the SATA0 to SATA3 connectors on the backplane, respectively.
- While matching the pin 1 (indicated by the triangleΔ) of the S1 and the pin 1 (indicated by the bold line) of the CON803, connect the S1 connector of the built-in SAS/SATA cable to the CON803 connector on the backplane.
- Connect the miniSASHD connector of the built-in SAS/SATA cable to the connectors for ports 0-3 on the optional RAID controller.

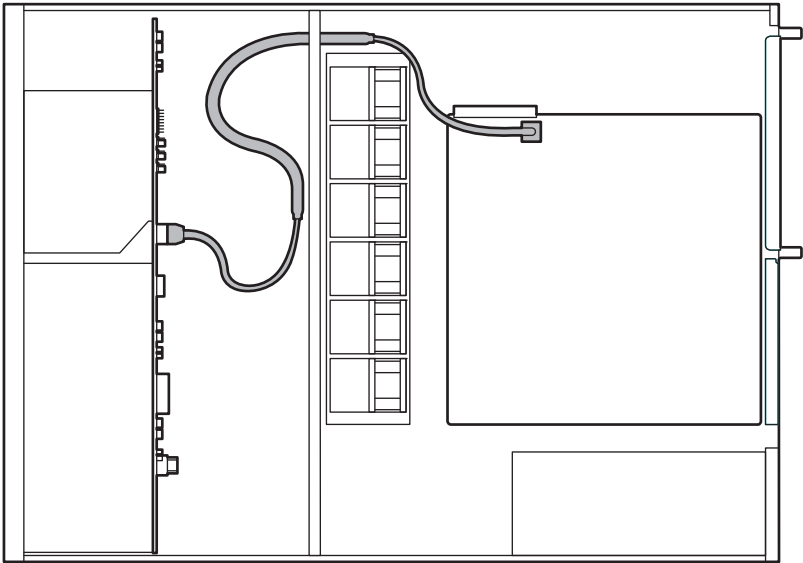


Optional RAID Controller	Hard disk drive	Backplane
Ports 0-3	SLOT 0	SATA 0
	SLOT 1	SATA 1
	SLOT 2	SATA 2
	SLOT 3	SATA 3

In the 2.5-inch drive model, where to connect on the backplane differs depending on the number of hard disk drives installed (1 to 4 or 5 to 8). See the description below for the backplane number and the slot number on the hard disk drive.

Using the on-board SATA controller in a 2.5-inch drive model (1 to 4 drives)

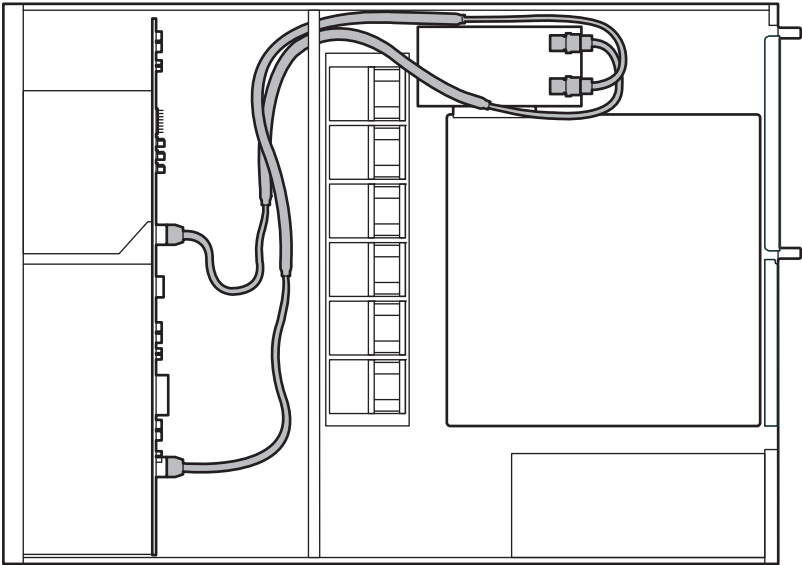
- Using the built-in SAS/SATA cable by which standards are attached to the server.
- Connect the miniSASHD connector of the built-in SAS/SATA to the SAS0-3 connectors on the backplane.
- Connect the miniSASHD another connector of the built-in SAS/SATA to the MINISAS_HD connector on the motherboard.



Motherboard	Hard disk drive	Backplane
MINISAS_HD	SLOT 0	SAS0-3
	SLOT 1	
	SLOT 2	
	SLOT 3	

Using optional RAID controller for a 2.5-inch drive model with eight hard disk drives installed (1 to 8 drives)

- Using the built-in SAS/SATA cable by which standards are attached to the server and K410-348(00) SAS/SATA cable (option).
- Connect the miniSASHD connector of the built-in SAS/SATA cable to the SAS 0-3 connector on the backplane, and then the other connector at the end of the cable to the connectors for ports 0-3 on the optional RAID controller.
- Connect the miniSASHD connector of K410-348(00) cable to the SAS 4-7 connector on the backplane, and then the other connector at the end of the cable to the connector for ports 4-7 on the optional RAID controller.



Optional RAID controller	Hard disk drive	Backplane
Ports 0-3	SLOT 0	SAS 0-3
	SLOT 1	
	SLOT 2	
	SLOT 3	
Ports 4-7	SLOT 4	SAS 4-7
	SLOT 5	
	SLOT 6	
	SLOT 7	

1.8.2 Notes on setting up a RAID System

Note the following points when setting up a RAID system.

- The number of hard disk drives required varies depending on the RAID level.
- If the on-board RAID controllers or optional RAID controllers (N8103-176/188/205/206/210) are used, the RAID system cannot be built in RAID5/RAID6.

RAID level	The minimum number of hard disk drives required to set up a RAID system	
	On-board RAID Controller or N8103-176/188/205/206/210	N8103-177/178/179/207/208/211
RAID 0	1	1
RAID 1	2	2
RAID 5		3
RAID 6		3
RAID 10	4	4
RAID 50		6
RAID 60		6

- Use SAS/SATA hard disk drives or SSDs that have the same capacity and rotational speed.
- When installing an OS in your RAID system, you can easily complete the setup process, including RAID configuration and OS installation, by using EXPRESSBUILDER.
- If you want to install the OS manually, use the RAID system configuration utility. The utility can be run during POST which starts immediately after the server is turned on. For details, see *Chapter 2 (5. RAID System Configuration)* in "Maintenance Guide" or the manual supplied with the optional RAID controller.

Important

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

- Depending on Option ROM settings, the numbering of RAID controller on OS is different from the numbering on EXPRESSSCOPE Engine3 (EE3).
The order of the numbers to be assigned to the utilities is shown below.
Be careful when referring to the log or replacing the RAID controller.

Select Disabled or Enabled of the Option ROM function of the RAID Controller according to the manual of the RAID controller to be mounted.

Case1:

PCI slot number	RAID Controller	OptionROM	The number of RAID Controller	
			On OS*	On EE3
Slot1A	Int RAID Controller	Enabled	CTRL = 3	RAID Controller # = 3
Slot1B	Ext RAID Controller	Disabled	CTRL = 1	RAID Controller # = 1
Slot1C	Ext RAID Controller	Disabled	CTRL = 2	RAID Controller # = 2

Case2:

PCI slot number	RAID Controller	OptionROM	The number of RAID Controller	
			On OS*	On EE3
Slot1A	Int RAID Controller	Enabled	CTRL = 2	RAID Controller # = 2
Slot1B	Ext RAID Controller	Disabled	CTRL = 1	RAID Controller # = 1
Slot1C	-		-	-

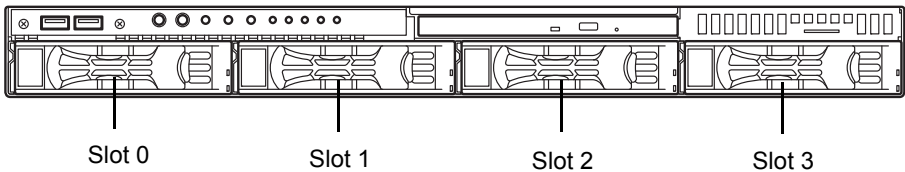
Case3:

PCI slot number	RAID Controller	OptionROM	The number of RAID Controller	
			On OS*	On EE3
Slot1A	Int RAID Controller	Enabled	CTRL = 2	RAID Controller # = 2
Slot1B	-	-	-	-
Slot1C	Ext RAID Controller	Disabled	CTRL = 1	RAID Controller # = 1

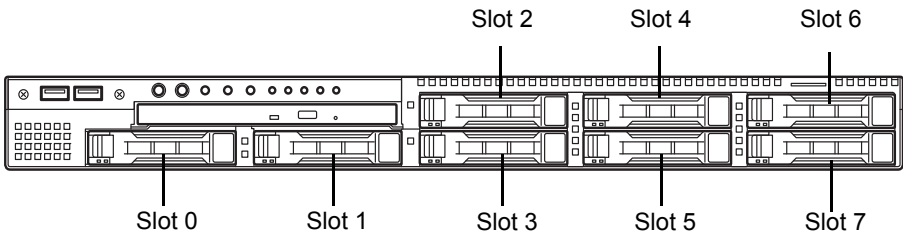
*Universal RAID Utility (URU) and System Event LOG

HDD slot numbering

3.5-inch drive model



2.5-inch drive model



<Mix of drives in 2.5-inch drive model>

You can install two types of drives in the HDD slot (eight slots including that of an additional cage) of the 2.5-inch drive model.

Five types of HDD can be installed: SAS HDD 10,000 rpm, SAS HDD 15,000 rpm, SATA HDD 7,200 rpm, SAS SSD, SATA SSD.

Important

- When drives are mixed, the RAID controller is required.
- A mix of drives in the same disk array (RAID group) is not allowed.
- To define the hot spare disk when drives are mixed, set as "Dedicated Hot Spare" for the same type of drive to prevent the drives from being mixed in the same RAID group (disk array). "Global Hot Spare" cannot be used.

1.9 RAID Controller and Flash backup unit (FBU)

When using the RAID controller (N8103-176/177/178/179/206/207/208), the optional FBU or on-board FBU is used in order to avoid data loss caused by accidents during a write-back operation. The model of the FBU to be used depends on a RAID controller.

- For N8103-176/177/178, use N8103-181 Flash Backup Unit
- For N8103-206/207/208, use N8103-209 Flash Backup Unit
- For N8103-179, use flash backup unit that comes with RAID controller.

1.9.1 Handling precautions

Observe the following precautions to use the FBU.

- Use the FBU that supports the RAID controller used.
- Before installing the FBU, 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 the FBU, refer to the manual that comes with it.

1.9.2 Installing RAID controller and Flash Backup Unit (FBU)

This section describes the procedure of installing a flash backup unit that comes with N8103-179 RAID controller, N8103-181 flash backup unit and N8103-209 flash backup unit.

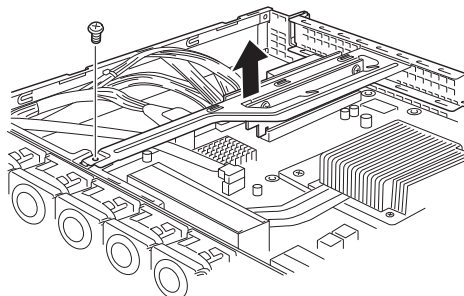
1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. See *Chapter 2 (1.5 Removing the Top Cover)* to remove the top cover.

<For PCI 1A slot>

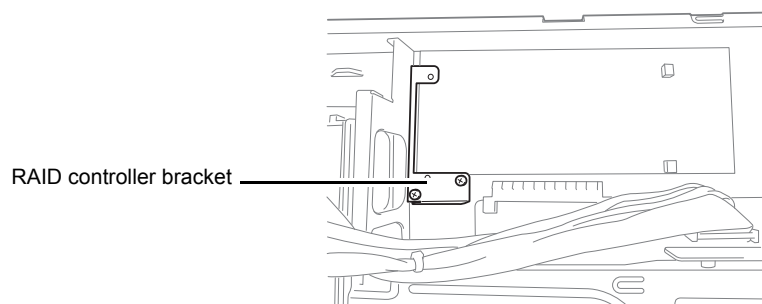
This is a dedicated slot used when mounting the RAID controller (N8103-188/176/176/177/178/205/206/207/208/210/211).

The parts other than this card cannot be implemented.

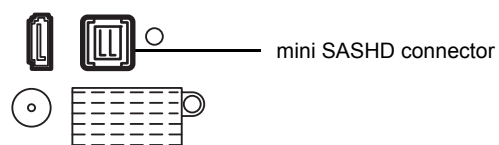
3. When a card is mounted to the PCI 1C slot of the riser card, remove the riser card temporarily.
Remove one screw fixing the riser card, hold both edges of the riser card, and then lift it straight to remove it from this server.



4. Remove the two screws, and remove the RAID controller bracket that is fixed to the PCI 1A slot of this server.



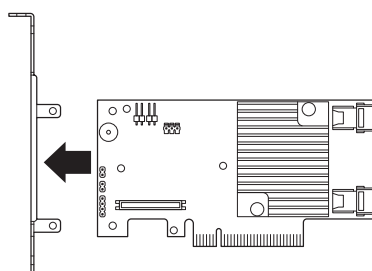
5. Remove the SAS/SATA cable connected to the mini SASHD connector of the motherboard.



6. Remove two screws of the RAID controller, and remove the PCI bracket.

Tips

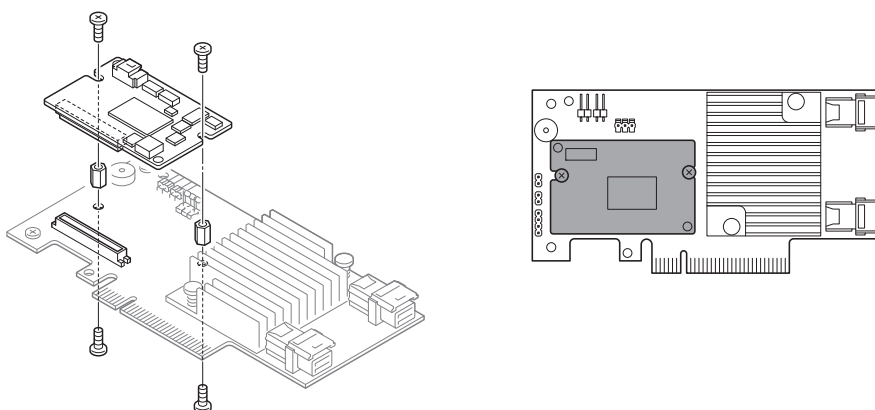
The following diagram shows an example of N8103-176/177/178. Remove the PCI bracket from the RAID controller also in N8103-206/207/208.



7. Connect the FBU control board to the RAID controller.

Tips

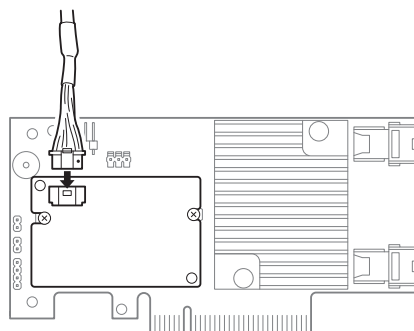
The following diagram shows an example of N8103-176/177/178. The control board is installed in N8103-206/207/208 as standard, and installation of this part is not required.



8. Connect the FBU control cable to the FBU control board connector.

Tips

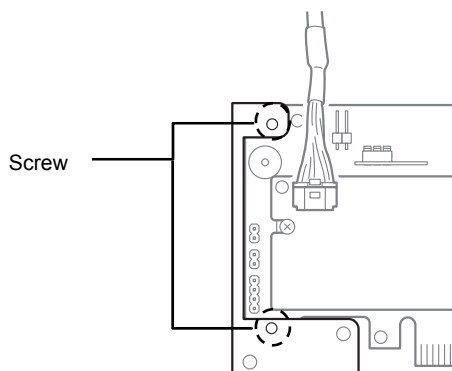
For the position of the connector of N8103-206/207/208, refer to the manual attached to N8103-206/207/208.



9. Install the RAID controller bracket that was removed in step 4 to the RAID controller by using two screws that were removed in step 6. Place the RAID controller bracket on the front side of the RAID controller, and fix it by using two screws from the back side.

Tips

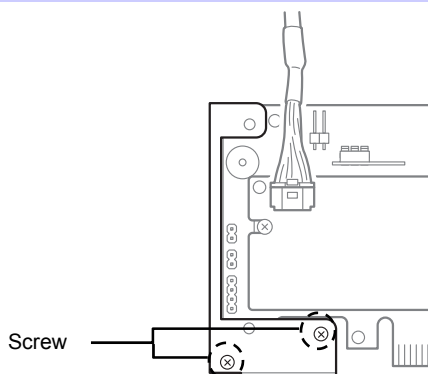
The following diagram shows an example of N8103-176/177/178.



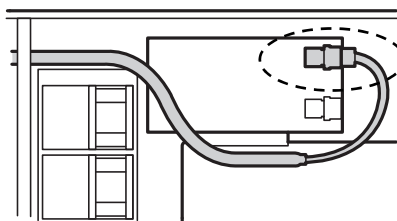
10. Fix the RAID controller to the PCI 1A slot by using two screws that were removed in step 4.

Tips

The following diagram shows an example of N8103-176/177/178.



11. Connect the SAS/SATA cable that were removed in step 5 to the RAID controller.



<For the 3.5-drive model>

For N8103-188, connect to PORT 0, and for N8103-176/177/178, connect to PORTS 0-3.

For N8103-205/206/207/208/210/211, connect to PORT C0.

<For the 2.5-drive model>

For N8103-188, connect to PORT 0, and for N8103-176/177/178, connect to PORTS 0-3.

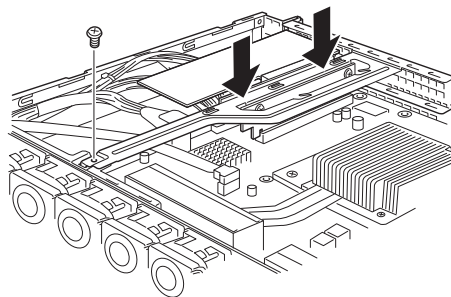
For N8103-205/206/207/208/210/211, connect to PORT C0.

To connect 5 units or more of the hard disks, K410-348 (00) built-in SAS/SATA cable is required. For N8103-188, connect the RAID controller to PORT 0, and for N8103-176/177/178, connect the RAID controller to PORTS 4-7.

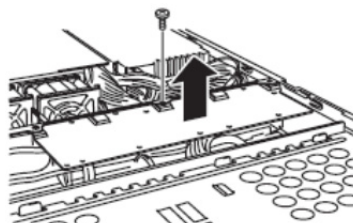
For N8103-205/206/207/208/210/211, connect to PORT C1.

For details, refer to "1.8.1 Connecting cables".

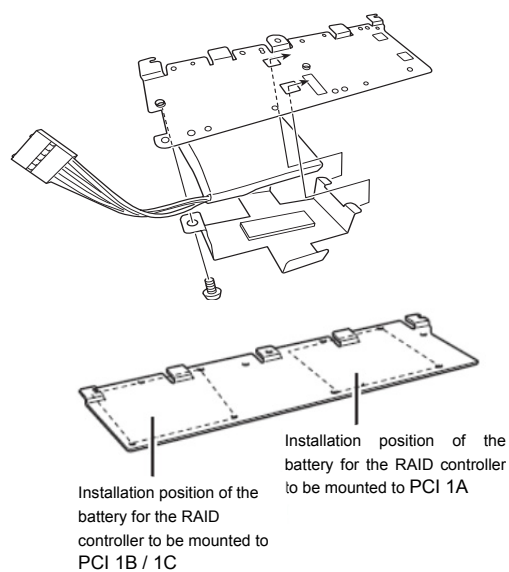
12. When the riser card was removed as described in step 3, insert the riser card into the slot of the motherboard, and fix it by using one screw that was removed in step 3.



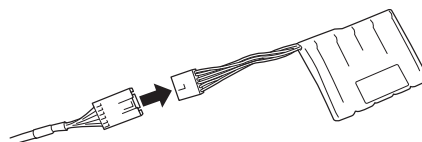
13. Remove one screw, and remove the battery mounting chassis.



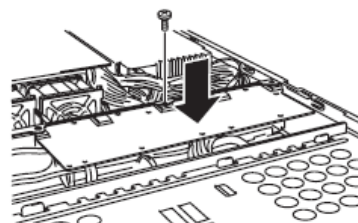
14. Install FBU to the battery mounting chassis by using one screw. The installation position is on the PCI 1A side. See the figure.



15. Connect the FBU control cable and flash backup unit.



16. Install the battery mounting chassis that was removed in step 13 by using one screw.

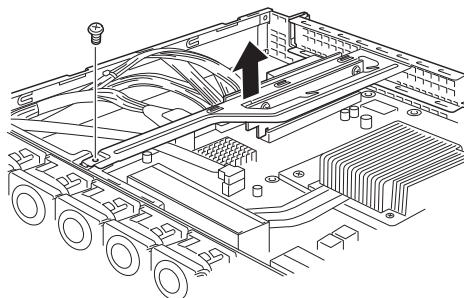


17. Install the removed parts.

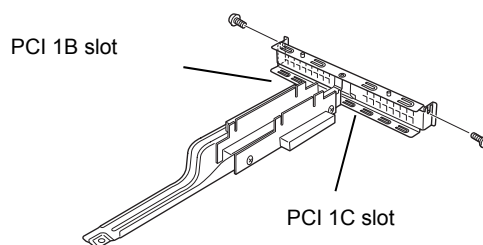
<For PCI 1B / 1C slot>

Mount the RAID controller (N8103-179) to the PCI 1B or 1C slot.

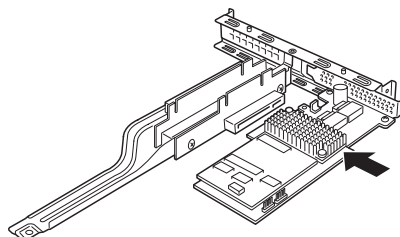
3. Remove one screw fixing the riser card, hold both edges of the riser card, and then lift it straight to remove it from this server.



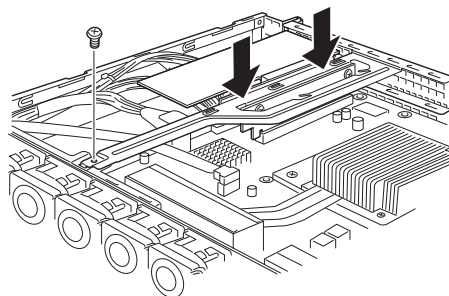
4. Remove one screw from the riser card, and remove the blank cover of the slot to which the RAID controller is mounted.



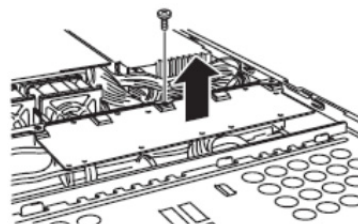
5. Install the RAID controller to the riser card, and connect the FBU control cable.



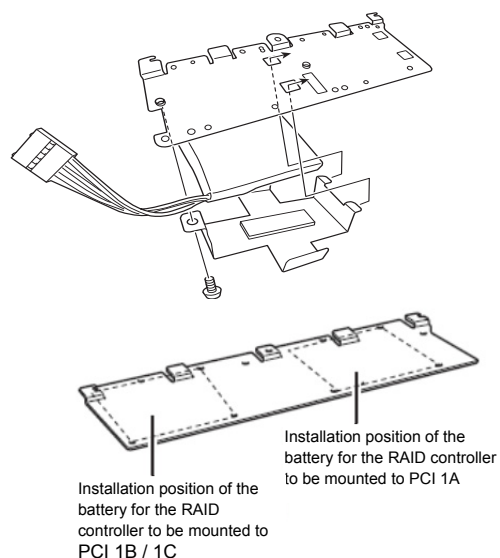
6. Insert the riser card into the slot of the motherboard, and fix it by using one screw that was removed in step 3.



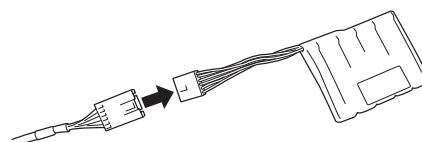
7. Remove one screw, and remove the battery mounting chassis.



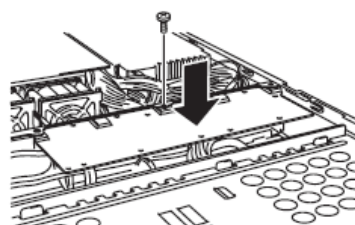
8. Install FBU to the battery mounting chassis by using one screw. The installation position is on the PCI 1B or 1C side. See the figure.



9. Connect the FBU control cable and flash backup unit.



10. Install the battery mounting chassis that was removed in step 7 by using one screw.



11. Install the removed parts.

1.10 PCI Card

The server provides a riser card where you can install a PCI card on the motherboard. The riser card can have two low-profile PCI cards installed.

Connect PCI cards for network expansion or file device function into PCI card slots provided on the riser card.

Important Avoid static electricity to work with the procedure below. For details, see *Chapter 2 (1.2 Overview of Installation and Removal)*.

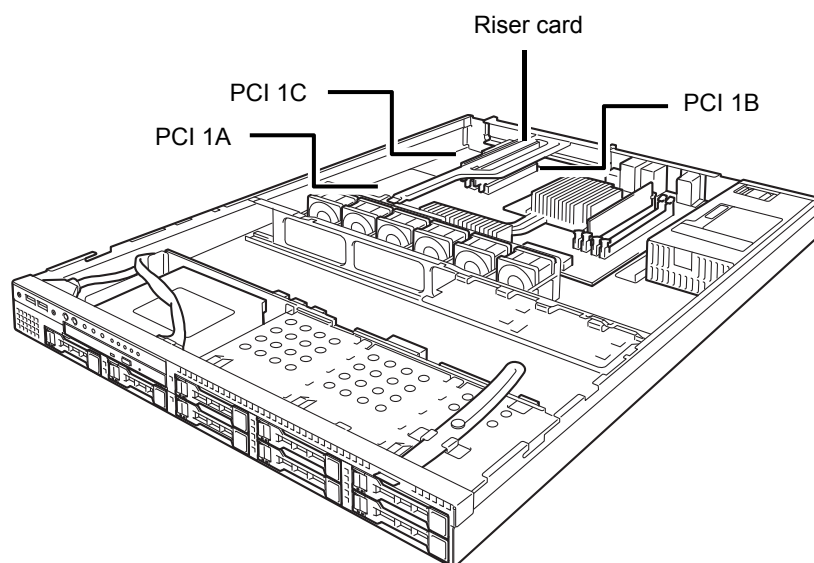
Note

- There are restrictions for combination of the PCI boards that can be installed. See the system configuration guide for details.
- Only Low-profile type of PCI cards can be installed in the riser card of the server. Check the card spec before installation.

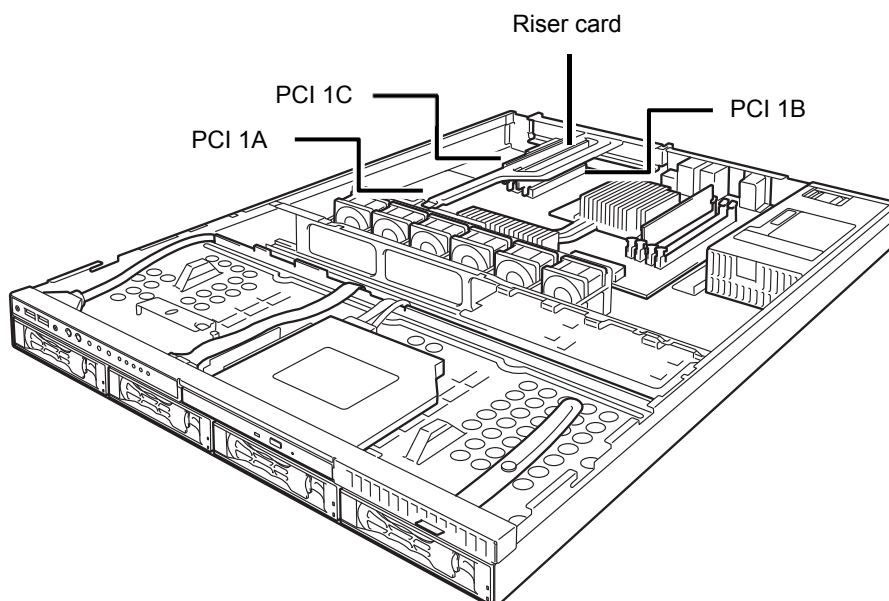
Tips

If SAS controllers, LAN adapter (network boot), or Fibre Channel controllers are used without connecting to hard disk drives with OS installed, set the **Option ROM** for the card to **Disabled**. For the setting, see *Chapter 2 (1. System BIOS)* in "Maintenance Guide".

2.5-inch hard disk drive model



3.5-inch hard disk drive model



1.10.1 Notes

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

- Do not touch the terminals of the riser cards and the leads of electronic components with your bare hand. Fingerprints and dust left on them cause the server to malfunction due to a connection failure or damage to the leads.
- The server provides no connector to connect a LED connector which is supplied in RAID Controller used to indicate disk access.
- The search order for PCI bus slot on boot is as follows.
Slot 1B → Slot 1C → Slot 1A
- The PCI devices of the same type (including onboard PCI device) may be recognized in different order from that described above, depending on OS or RAID System BIOS utility. Check the slot location of PCI device by PCI bus number, device number and function number shown in the table below.

PCI device	PCI bus number	Device number	Function number
Onboard NIC1	8Fh	0	0
Onboard NIC2	8Fh	0	1
Slot 1A	0Ch	×	×
Slot 1B	1h	×	×
Slot 1C	90h	×	×

- Set **Disabled** for the optional ROM of a LAN device not to be booted by using the BIOS Setup utility.
- If a bootable device such as a PCI card or USB device is added, the boot order may change. In the BIOS Setup utility, select **Hard Drive BBS Priorities** from the **Boot** menu, and then specify a higher priority for the boot device.
Boot → Hard Drive BBS Priorities → Check the display
If the boot device is an HDD under an optional RAID Controller, the display is (Bus xx Dev 00) PCI RAID Adapter. Note that the value for xx changes depending on the PCI slot where a RAID Controller is installed.

1.10.2 Supported cards and available slots

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

Tips

- Different cards mounted on the same bus operate at the lower frequency.
- When the operation performance of a PCI card is higher than the PCI slot on the server, the PCI card operates with the performance of the PCI slot on the server.
- Standard network
Teaming among standard network controllers (both on-board cards) is supported.
- For the N8117-01A, use a cable with the following product name and designation:
Product name: RS-232C (B)
Designation: 804-062746-820

(1/2)

Model name	Product name		PCI 1A	PCI 1B	PCI 1C	Remark
		PCI slot performance ^{*1}	x4 lane	X16 lane	x4 lane	
		Transfer bandwidth (per lane)	8 Gb/s			
		Slot size	Low profile			
		PCI card type	x8 socket	x16 socket	x8 socket	
		Available card size	Up to 173 mm			
N8103-142	SAS controller (Card performance: PCI EXPRESS 2.0 (x8))	–	○	○	Dedicated to connecting external devices	
N8103-184	SAS controller (Card performance: PCI EXPRESS 3.0 (x8))	–	○	○		
N8103-205	RAID Controller (RAID 0/1) (Card performance: PCI EXPRESS 3.0 (x8))	○	–	–	For connection of the built-in disk Connection with the flash back up unit is prohibited	
N8103-210	RAID Controller (2 GB, RAID 0/1) (Card performance: PCI EXPRESS 3.0 (x8))	○	–	–		
N8103-211	RAID Controller (2 GB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 3.0 (x8))	○	–	–		
N8103-206	RAID Controller (2 GB, RAID 0/1) (Card performance: PCI EXPRESS 3.0 (x8))	○	–	–	For connection of the built-in disk A flash back up unit can be connected	
N8103-207	RAID Controller (2 GB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 3.0 (x8))	○	–	–		
N8103-208	RAID Controller (4 GB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 3.0 (x8))	○	–	–		
N8103-188	RAID Controller (RAID 0/1) (Card performance: PCI EXPRESS 3.0 (x8))	○	–	–	Dedicated to connecting internal disks	
N8103-176	RAID Controller (1GB, RAID 0/1) (Card performance: PCI EXPRESS 3.0 (x8))	○	–	–	Dedicated to connecting internal disks An extra battery (N8103-181) can be connected	
N8103-177	RAID Controller (1GB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 3.0 (x8))	○	–	–		
N8103-178	RAID Controller (2 GB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 3.0 (x8))	○	–	–		
N8103-179	RAID Controller (1 GB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 3.0 (x8))	–	○	○	For connecting external disks The RAID cache can be backed up by using the flash backup unit that comes with N8103-179. Up to 1.	
N8118-307	Dual M.2 SATA mount kit	–	–	○	M.2 SATA SDD mount kit	
N8190-159	Fibre Channel controller (8 Gbps/Optical) (Card performance: PCI EXPRESS 2.0 (x8))	–	○	○	For connecting an external Fibre Channel	
N8190-160	Fibre Channel controller (2 ch) (8 Gbps/Optical) (Card performance: PCI EXPRESS 2.0 (x8))	–	○	○	For connecting an external Fibre Channel	
N8190-161	Fibre Channel controller (16 Gbps/Optical) (Card performance: PCI EXPRESS 3.0 (x8))	–	○	○	For connecting an external Fibre Channel	
N8190-162	Fibre Channel controller (2 ch) (16 Gbps/Optical) (Card performance: PCI EXPRESS 3.0 (x8))	–	○	○	For connecting an external Fibre Channel	

(2/2)

Model name	Product name		PCI 1A	PCI 1B	PCI 1C	Remark
		PCI slot performance ^{*1}	x4 lane	X16 lane	x4 lane	
		Transfer bandwidth (per lane)	8 Gb/s			
		Slot size	Low profile			
		PCI card type	x8 socket	x16 socket	x8 socket	
		Available card size	Up to 173 mm			
N8104-150	1000BASE-T connection board (1ch) (Card performance: PCI EXPRESS 2.0 (x1))	–	○	○	For additional LAN. PCI Express 2.0(x4) card shape.	
N8104-151	1000BASE-T connection board (2ch) (Card performance: PCI EXPRESS 2.0 (x1))	–	○	○	For additional LAN. PCI Express 2.0(x4) card shape.	
N8104-152	1000BASE-T connection board (4ch) (Card performance: PCI EXPRESS 2.0 (x4))	–	–	○	For additional LAN. Cannot use a LAN cable with boots.	
N8104-149	10GBASE connection board (SFP+/2 ch) (Card performance: PCI EXPRESS 2.0 (x8))	–	○	○	For additional LAN Prepare SFP module [N8104-129] if needed.	
N8104-157	10GBASE-T connection board (2 ch) (Card performance: PCI EXPRESS 3.0 (x4))	–	○	○	For additional LAN PCI Express 3.0 (x4) card shape.	
N8105-48	Graphics Accelerator (Card performance: PCI EXPRESS 2.0 (x16))	–	○	–	For connecting dual monitors	
N8117-01A	Additional RS-232C connector kit	–	○	○	For additional serial (RS-232C) port Up to 1	

- Installed as standard ○ Can be installed – Cannot be installed

*1 Lane: Indicates the transfer performance (transfer bandwidth).

<e.g.> For PCI Express

1 lane = 2.5 Gbps (unidirectional), 4 lanes = 10 Gbps (unidirectional)

For PCI Express 2.0

1 lane = 5 Gbps (unidirectional), 4 lanes = 20 Gbps (unidirectional)

For PCI Express 3.0

1 lane = 8 Gbps (unidirectional), 4 lanes = 32 Gbps (unidirectional)

Socket: Indicates the connector size. A card up to the number of sockets can be connected.

<e.g.> x4socket = x1card, x4card can be installed. x8 card cannot be installed.

- ◆ Maximum card depth that can be inserted.
LowProfile: Up to 173 mm
- ◆ For details of functions of each card, refer to the technical guide.
- ◆ The card performance described in the parentheses after the Product name indicates the maximum operation performance of the card.
- ◆ When the operation performance of a PCI card is higher than the PCI slot on the server, the PCI card operates with the performance of the PCI slot on the server.

(1) PCI slot limitations

See the table below for the limitations on installing PCI cards (due to the number of interrupts that can be processed in the system) depending on the installed processor.

Processor	RAID controller required	PCI slot limitations
Pentium G4560 Xeon E3-1220v6 Xeon E3-1225v6	Yes	You can install up to one N8190-157A Fibre Channel Controller (1ch). Other PCI cards can be installed up to the limit.
	No	No limitations.
Other processors	—	No limitations

(a) PCI slot limitations for VMware

- Do not install N8104-152 Quad Port 1000BASE-T Adapter when any of the following cards is installed.
N8104-157 Dual Port 10GBASE-T Adapter
N8104-149 10GBASE SFP+ Adapter (SFP+/2ch)
- For the configuration limitation for VMware ESXi, refer to the following documents.
VMware ESXi 6.0
<https://www.vmware.com/pdf/vsphere6/r60/vsphere-60-configuration-maximums.pdf>
VMware ESXi 6.5 Later
<https://www.vmware.com/pdf/vsphere6/r65/vsphere-65-configuration-maximums.pdf>

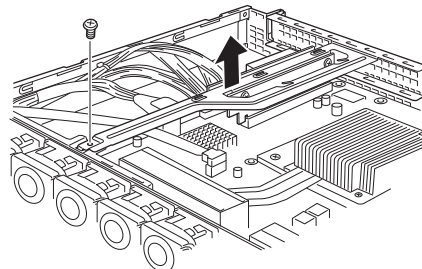
1.10.3 Installation

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

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

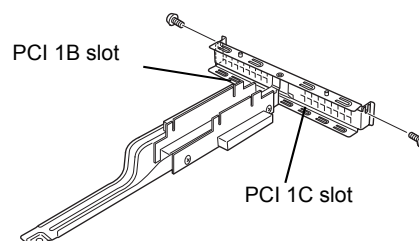
Note Check the card type (low profile or full-height type) which respective riser card supports and the type of PCI card to be installed.

1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. See *Chapter 2 (1.5 Removing the Top Cover)* to remove the top cover.
3. Remove one screw securing the riser card. Hold the both ends of the riser card and lift it off.



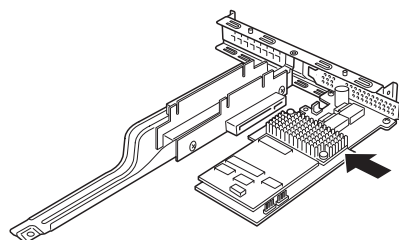
Note Be careful not to contact with other parts.

4. Confirm the installation position with the reference to the table in *Chapter 2 (1.10.2 Supported cards and available slots)*.
5. Remove one screw from the riser card and remove the blank cover.



Note Keep the blank cover for future use.

6. Install a PCI card to the riser card. When installing the card, position the terminal part of the PCI card to the riser card slot and insert it.



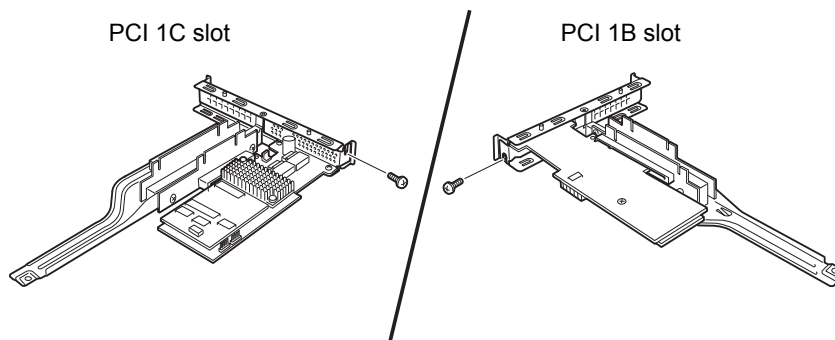
Important Do not touch the terminal part of riser cards or PCI cards and the signal pins of electric parts installed on the card. Installing cards with dirt or oil can cause malfunction.

Tips If you have trouble installing the card, remove the card once and try again. If you apply excessive pressure on the card, a PCI card or riser card might break.

Note

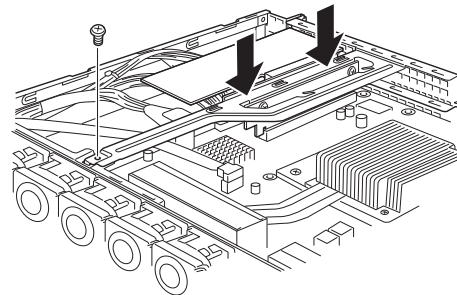
- Make sure that the head of a PCI card bracket is seated into the fixed slot.
- Depending on type of PCI cards, the terminal part of the PCI card may be too large to fit in the connector.

7. Fix the PCI card with the screw you removed in step 5.



Tips If the cable which is to be connected to the connector on the motherboard of the server is provided on the board, connect it to the board before installing the riser card to the server.

8. Connect the riser card to the motherboard slot and fix the card with the screw you removed in step 3. When connecting the card, position the terminal part of the card to the slot on the motherboard and insert it.



9. Reassemble the server.
10. Turn on the server and 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".
11. To set up the PCI card, run the configuration utility on the installed the card, if necessary. For details, refer to the manual that comes with the card.
- If a RAID controller, SAS controller or LAN card which connects to any bootable device is added, the boot priority is changed to the default settings. Configure the boot priority in the **Boot** menu of the BIOS Setup Utility. For details, see *Chapter 2 (1.2.5 Boot)* in "Maintenance Guide".

Using the optional RAID controller

For details, refer to the manual that comes with optional RAID controller.

Important

- Avoid static electricity to work with the procedure below. For details, see *Chapter 2 (1.2 Overview of Installation and Removal)*.
- Do not change the mode to hibernate when building a RAID system.

Note

- When installing an optional RAID controller, run the BIOS Setup Utility, select **PCI Configuration** from the **Advanced** menu, and then make sure that the parameter of **PCI Slot xx ROM** (xx is PCI slot number) is set to **Enabled**.
- When connecting a RAID controller, 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.

1.10.4 Removal

To remove a riser card, reverse the installation procedure. Hold the riser card to which the PCI card is attached firmly and remove it. Additionally, another worker must hold this server to prevent it from moving when removing the riser card.

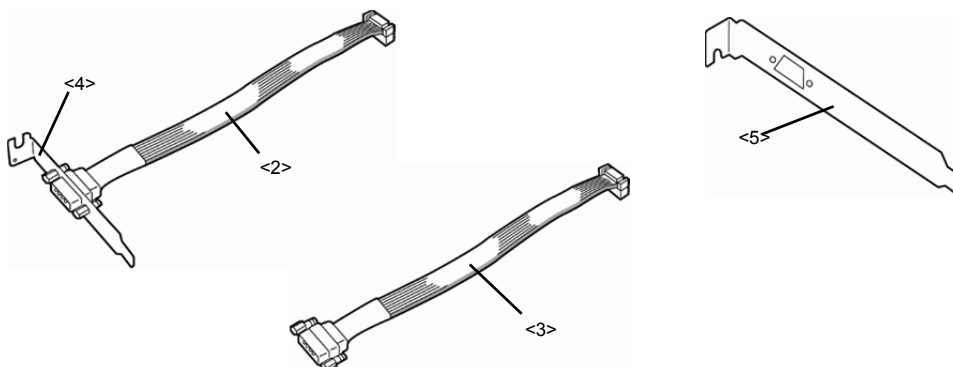
If using the server while the PCI card is removed, attach the blank cover that comes with the riser card.

1.10.5 Installing the N8117-01A extra RS-232C connector kit

Install a PCI card to connect to the PCI slot by using the following procedure. For details, refer to the instruction manual supplied with the connector kit.

The component parts for N8117-01A are as follows:

Item no.	Item name	Specification	Amount	Remarks
<1>	RS-232C connector Kit User's Guide	856-125671-002	1	
<2>	RS-232C cable (A)	804-063264-020	1	Not available for this server
<3>	RS-232C cable (B)	804-062746-820	1	
<4>	PCI bracket (1)	243-112122-001	1	Preinstalled to cable
<5>	PCI bracket (2)	243-112122-002	1	For full height PCI



This product uses a combination of items <3> and <4>.

Follow the procedure below to install the kit.

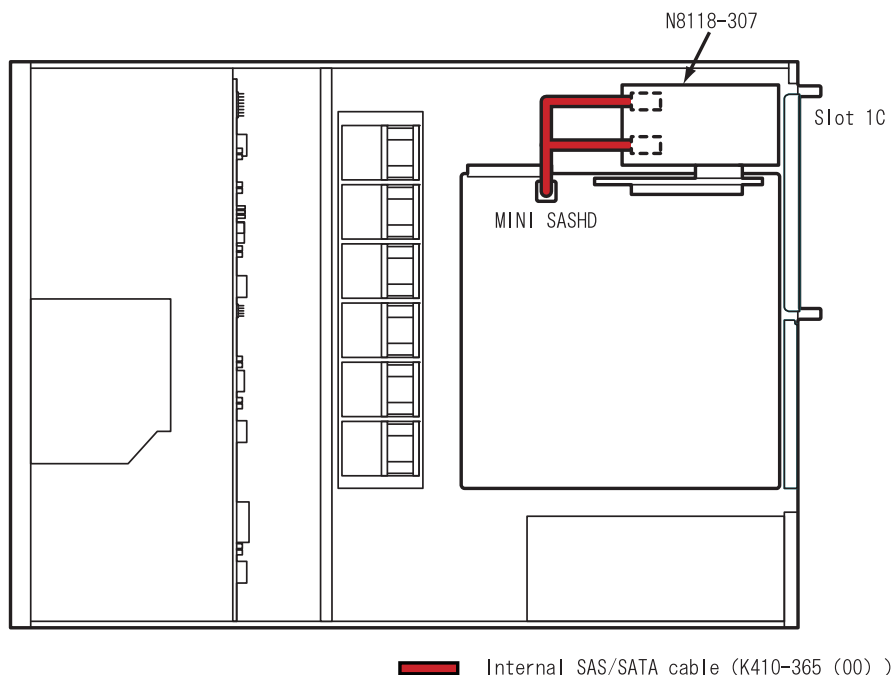
1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. See *Chapter 2 (1.5 Removing the Top Cover)* to remove the top cover.
3. Assemble <3> RS-232C cable (B) and <4> PCI bracket (1).
4. Refer to procedure 3-7 in *Chapter 2 (1.10.3 Installation)* to install RS-232C connector kit in the PCI slot.
5. Connect the RS-232C cable to the internal connector on the motherboard, making sure that the orientation is correct.
6. Form the cable, making sure that the cable does not interfere with other parts or slots, and connect the riser card as described in step 8 in *Chapter 2 (1.10.3 Installation)*
7. Reassemble the server.

1.10.6 Connecting Dual M.2 SATA mount kit (N8118-307)

The PCI 1C slot of the server can mount dual M.2 SATA mount kit (N811-307) which mounted at most 2 of 120GB M.2 SATA SSD (N8150-736) for internal connection.

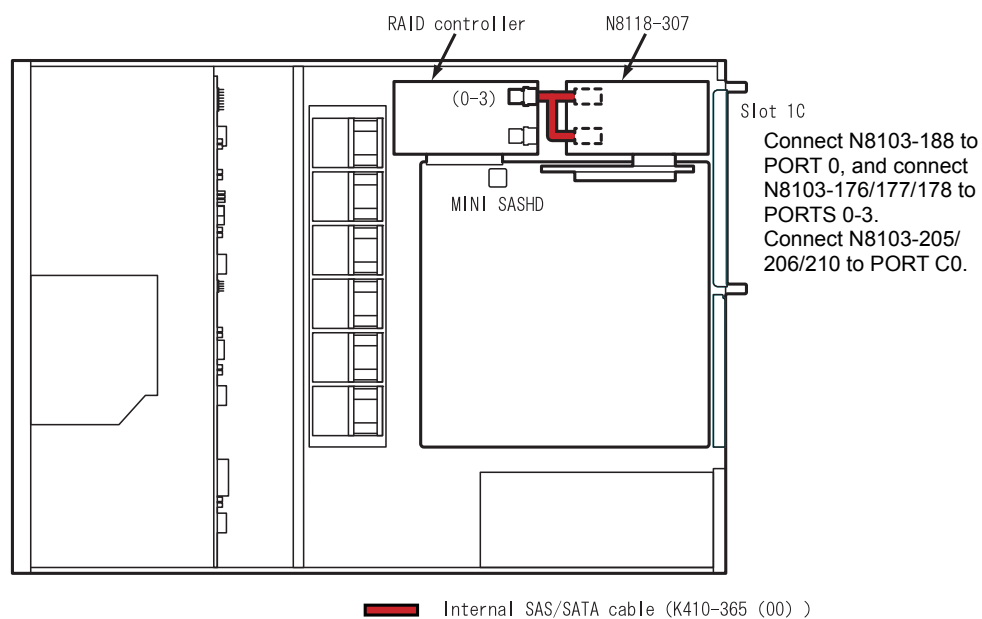
(a) Using SSDs by software RAID

Use the internal SAS/SATA cable (K410-365(00)) and connecting to the miniSAS connector on the motherboard.



(b) Using SSDs by hardware RAID

Use the internal SAS/SATA cable (K410-365(00)) and connecting to the RAID controller.

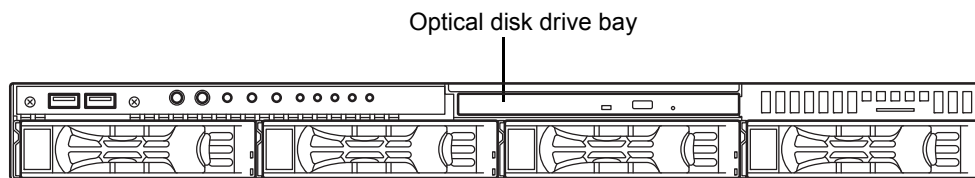
**Note**

M.2 SATA SSD and hard disc drive cannot be connected to the same RAID controller.

1.1.1 Optical Disk Drive

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

Important Do not install any unsupported optical disk drive.

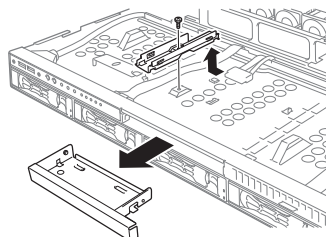


1.1.1.1 Installation

Install an optical disk drive in the following procedure.

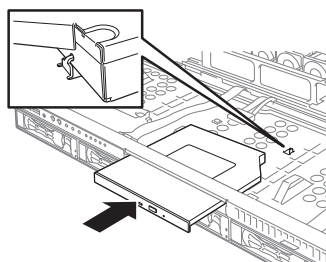
(a) 3.5-inch drive model

1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. See *Chapter 2 (1.5 Removing the Top Cover)* to remove the top cover.
3. Unscrew one screw securing the bracket of the optical disk drive and remove the optical disk drive cover.

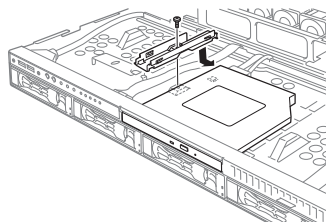


Important Keep the cover in the optical disk drive for future use.

4. Install the optical disk drive.



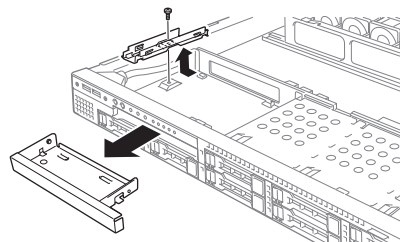
5. Screw the bracket you removed in step 3 to secure the optical disk drive in place.



6. Reassemble the server.

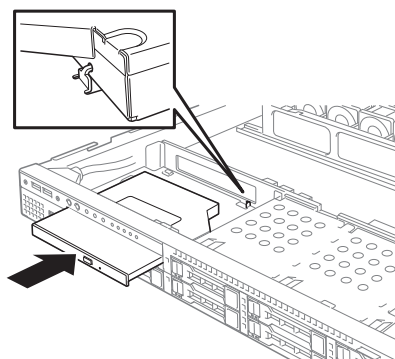
(b) 2.5-inch drive model

1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. See *Chapter 2 (1.5 Removing the Top Cover)* to remove the top cover.
3. Unscrew one screw securing the bracket of the optical disk drive and remove the optical disk drive cover.

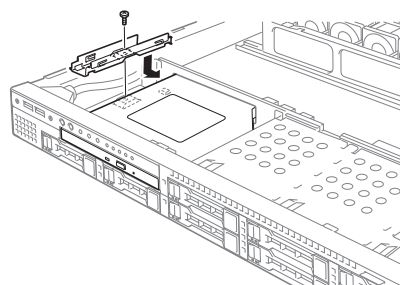


Important Keep the cover in the optical disk drive for future use.

4. Install the optical disk drive.



5. Screw the bracket you removed in step 3 to secure the optical disk drive in place.



6. Connect the cable of the optical disk drive, and reassemble the server.

1.11.2 Removal

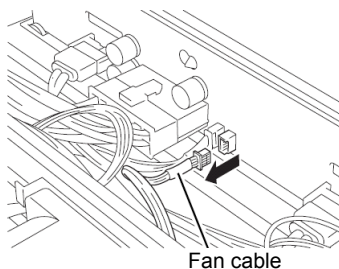
To remove an optical disk drive, reverse the installation procedure above.

1.12 Redundant Fan

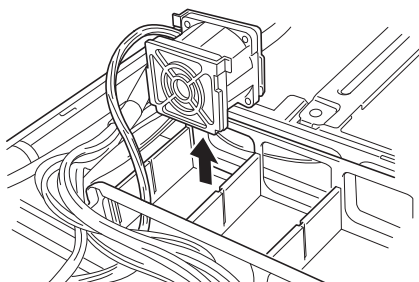
Replace the standard cooling fan with an optional redundant fan to make redundant fan configuration.

1.12.1 Replacing the standard fan unit with redundant fan unit

1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. See *Chapter 2 (1.5 Removing the Top Cover)* to remove the top cover.
3. Disconnect the fan cable from the backplane.

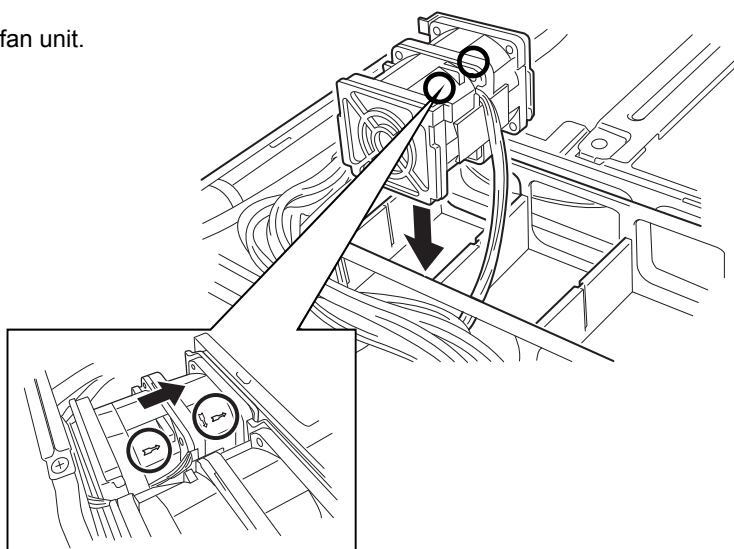


4. Lift the fan unit straight to remove it.



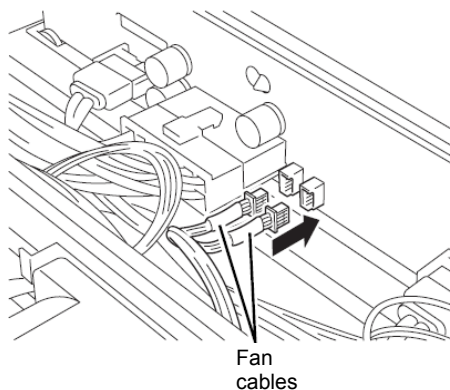
Important Keep the removed fan unit for future use.

5. Install the redundant fan unit.

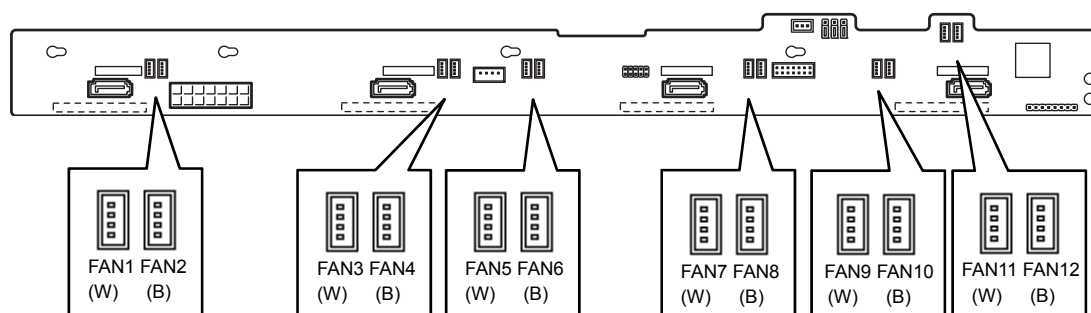


Important Make sure that the fan unit faces rearward of the chassis as shown by the arrows that indicate the air flow.

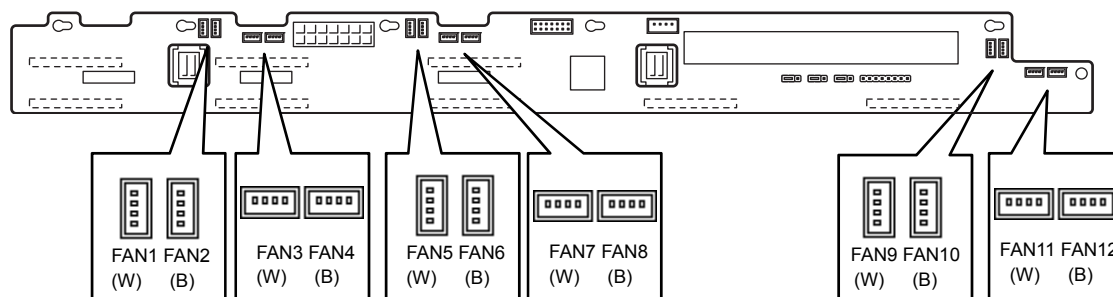
6. Connect the fan cables to the backplane. Make sure that the fan cables are not caught in the top cover, fan, or chassis.



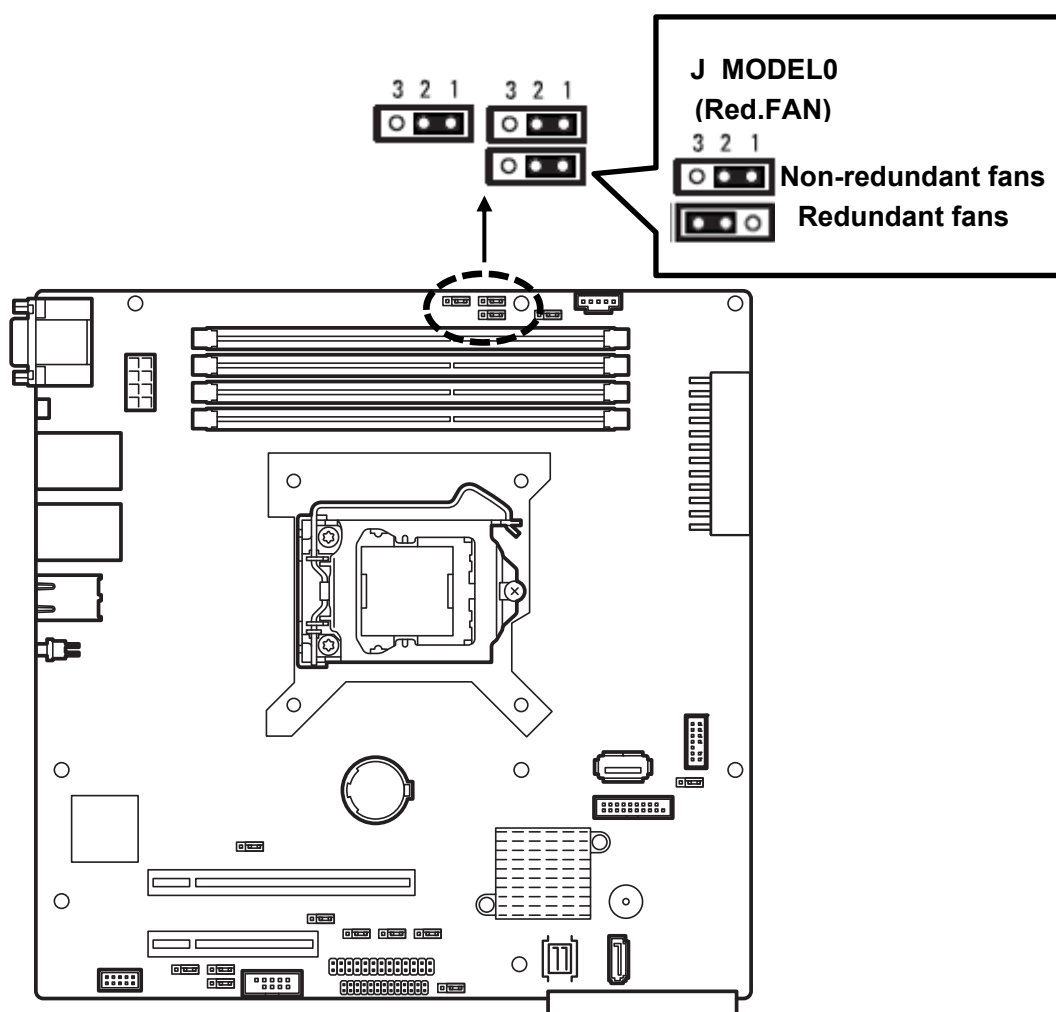
Backplane for 3.5-inch hard disk drive



Backplane for 2.5-inch hard disk drive



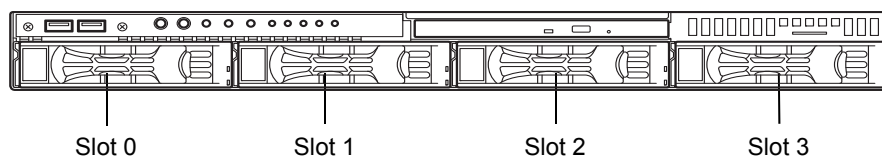
7. Change the jumper settings on the motherboard, as shown in the figure below.



Important Do not change the other jumper pins.

1.13 3.5-inch Hard Disk Drive

The hard disk drive bays can install up to four hard disk drives.



Important

- Use hard disk drives provided by NEC.
- Hard disk drives with different types of interfaces or different rotational speeds cannot be installed together within the same RAID array.
- If using hard disk drives in a RAID system, confirm the jumper settings and cabling.

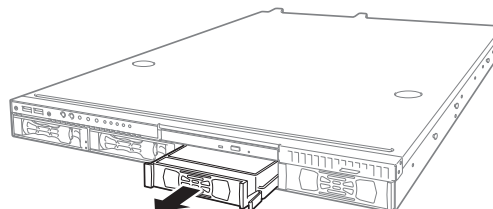
1.13.1 Installation

Install a hard disk drive by using the following procedure.

Important

In the RAID system, install the hard disk drives that have the same specifications (capacity, rotational speed and interface).

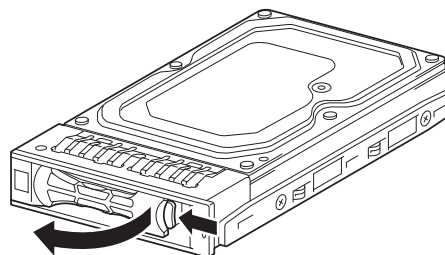
1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Locate the slot where you install the hard disk drive.
The server provides four slots. Install hard disk drives in ascending order of slot number.
3. Remove the dummy trays.



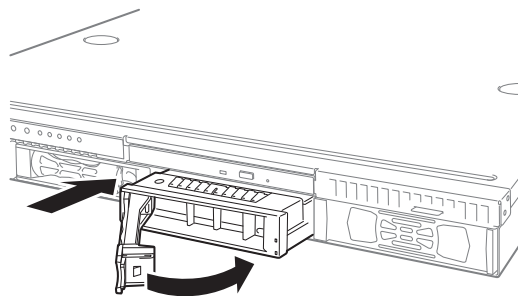
Important

- Keep the dummy trays for future use.
- Keep the dummy trays installed where hard disk drives are not installed.

4. Unlock the handle of the tray.



5. Hold the tray and its handle, and then 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.

Important

Be careful that your finger is not caught between the handle and the tray.

Note

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

7. Turn on the server, run the BIOS Setup Utility, and then specify the boot order from the **Boot** menu. For details about the **Boot** menu, see *Chapter 2 (1.2.5 Boot)* in "*Maintenance Guide*".
8. See *Chapter 2 (1.16 Attaching the Front Bezel)* to put the front bezel back.

1.13.2 Removal

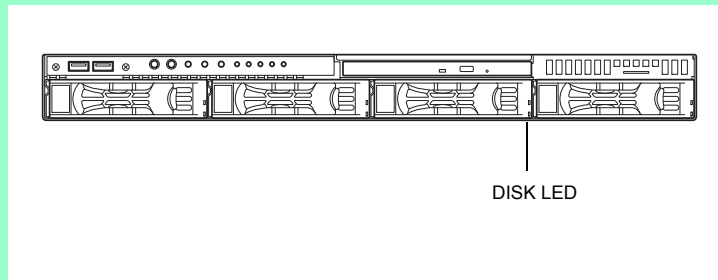
Remove a hard disk drive in the following procedure.

Important

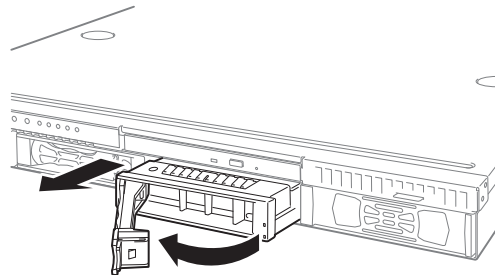
If you dispose of the removed hard disk drive, follow instructions described in Chapter 1 (1. Transfer, Movement, and Disposal) in *Safety Precautions and Regulatory Notices*.

Note

If you remove a failed hard disk drive, check the DISK LED lit in amber.



1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Push the lever to unlock and open the handle.
3. Hold the handle and tray firmly and pull the hard disk drive out.
4. Fill the open slot with the dummy tray, if necessary.

**Note**

Do not pull the handle only. The handle may break.

5. Turn on the server, run the BIOS Setup Utility, and then specify the boot order from the **Boot** menu. For details about the **Boot** menu, see *Chapter 2 (1.2.5 Boot)* in "*Maintenance Guide*".
6. See *Chapter 2 (1.16 Attaching the Front Bezel)* to put the front bezel back.

***1.13.3* Replacing a hard disk drive in the RAID system**

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

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

The disk is automatically rebuilt when hot swapping a failed hard disk drive.

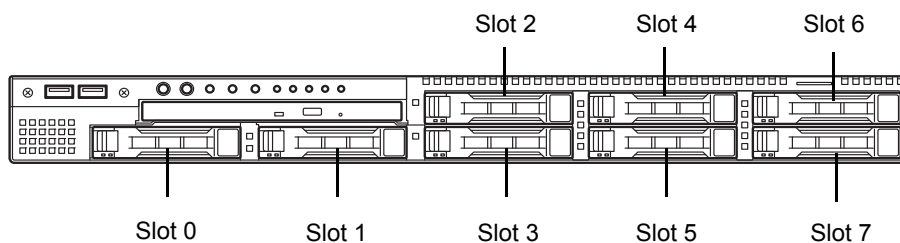
During the auto rebuild, the DISK LED on the hard disk drive flashes green and amber alternately to indicate that auto rebuild is being performed.

Observe the following precautions whenever executing auto rebuild.

- Do not turn off the server until auto rebuild completes.
- Leave an interval of at least 90 seconds between a hard disk drive removal and a hard disk drive installation.
- Do not replace another disk during the auto rebuilding.

1.14 2.5-inch Hard Disk Drive

The hard disk drive bays can install up to eight hard disk drives as standard.

**Important**

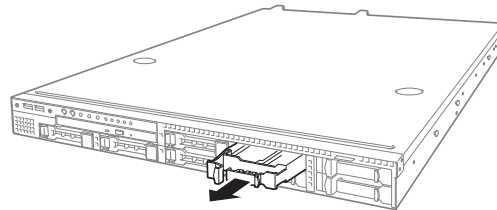
- Use hard disk drives provided by NEC.
- Hard disk drives with different types of interfaces or different rotational speeds cannot be installed together within the same RAID array .
- The hard disk drive cannot be mixed with SSD in the same RAID system.
- If using hard disk drives in a RAID system, confirm the jumper settings and cabling.

1.14.1 Installation

Install a hard disk drive by using the following procedure. Follow the same installation procedure for other bays.

Important In the RAID system, install the hard disk drives that have the same specifications (capacity, rotational speed and interface).

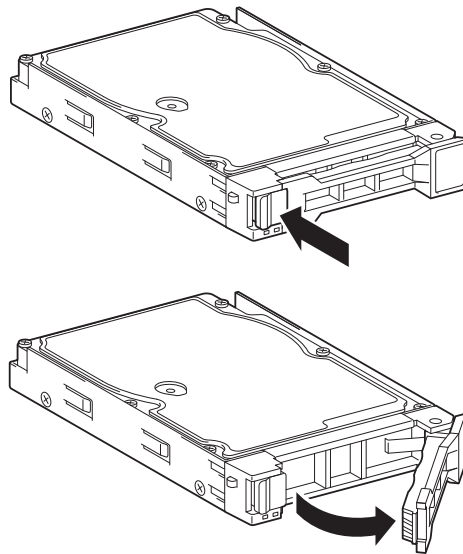
1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Locate the slot where you install the hard disk drive.
The server provides six slots as standard. Install hard disk drives in ascending port number order.
3. Remove the dummy trays.



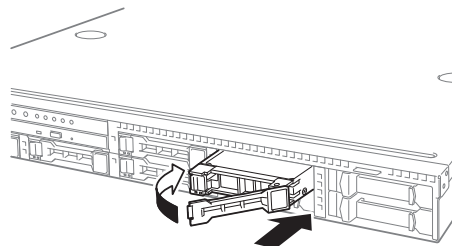
Important

- Keep the dummy trays for future use.
- Keep the dummy trays installed where hard disk drives are not installed.

4. Unlock the handle of the tray.



5. Hold the tray and its handle, and then 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.

Important

Be careful that your finger is not caught between the handle and the tray.

Note

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

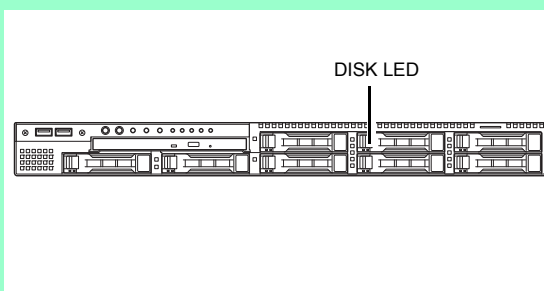
7. Turn on the server, run the BIOS Setup Utility, and then specify the boot order from the **Boot** menu. For details about the **Boot** menu, see *Chapter 2 (1.2.5 Boot)* in "*Maintenance Guide*".
8. See *Chapter 2 (1.16 Attaching the Front Bezel)* to put the front bezel back.

1.14.2 Removal

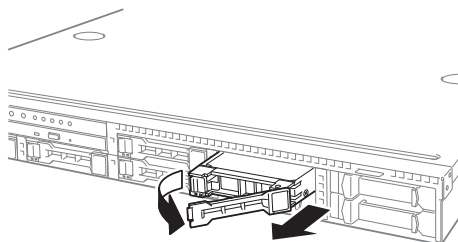
Remove a hard disk drive in the following procedure.

Important If you dispose of the removed hard disk drive, follow instructions described in Chapter 1 (1. Transfer, Movement, and Disposal) in Safety Precautions and Regulatory Notices.

Note If you remove a failed hard disk drive, check the DISK LED lit in amber.



1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Push the lever to unlock and open the handle.
3. Hold the handle and tray firmly and pull the hard disk drive out.



4. Fill the open slot with the dummy tray, if necessary.

Note Do not pull the handle only. The handle may break.

5. Turn on the server, run the BIOS Setup Utility, and then specify the boot order from the **Boot** menu. For details about the **Boot** menu, see *Chapter 2 (1.2.5 Boot)* in "Maintenance Guide".
6. See *Chapter 2 (1.16 Attaching the Front Bezel)* to put the front bezel back.

***1.14.3* Replacing a hard disk drive in the RAID system**

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

The auto rebuild feature is enabled in logical drives set to RAID 1, RAID 5, RAID 6, RAID 10, RAID 50 and RAID 60.

The disk is automatically rebuilt when hot swapping a failed hard disk drive.

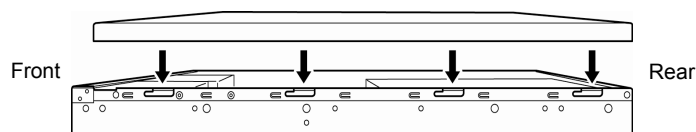
During the auto rebuild, the DISK LED on the hard disk drive flashes green and amber alternately to indicate that auto rebuild is being performed.

Observe the following precautions whenever executing the auto rebuild

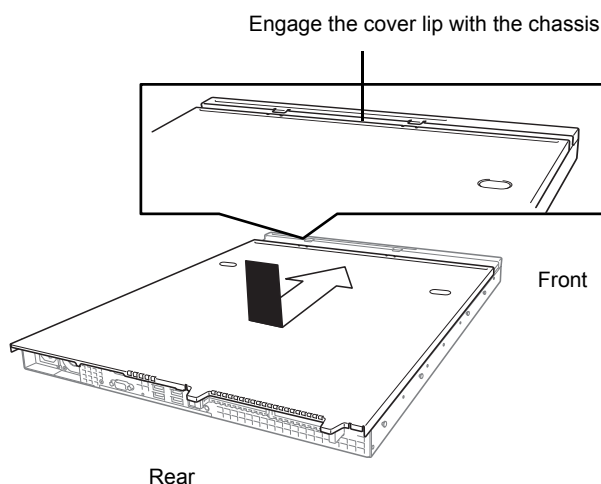
- Do not turn off the server until the auto rebuild ends.
- Leave an interval of at least 90 seconds between a hard disk drive removal and a hard disk drive installation.
- Do not replace another disk during the auto rebuilding.

1.15 Attaching the Top Cover

When attaching the top cover, make sure that the tab is securely inserted into the server frame, and then slide it forward. The top cover is locked when it makes a clicking sound.



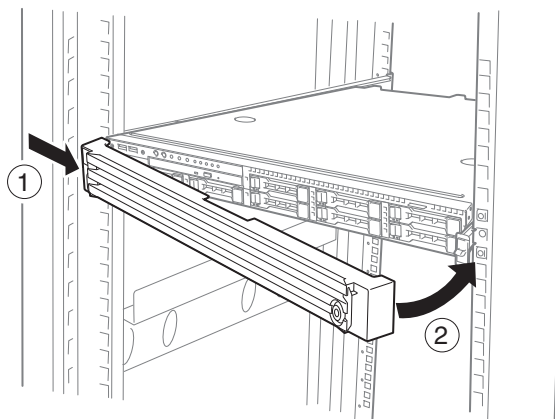
Check that the release button is raised. If the button stays depressed, slide the cover backward again.



1.16 Attaching the Front Bezel

Hook the tab on the left of the bezel to the server frame, and fit the bezel into the server.

Lock the bezel with the bezel lock key.



Important

Be careful not to accidentally press POWER Switch when attaching the front bezel.

2. Installation and Connection



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



2.1 Installation

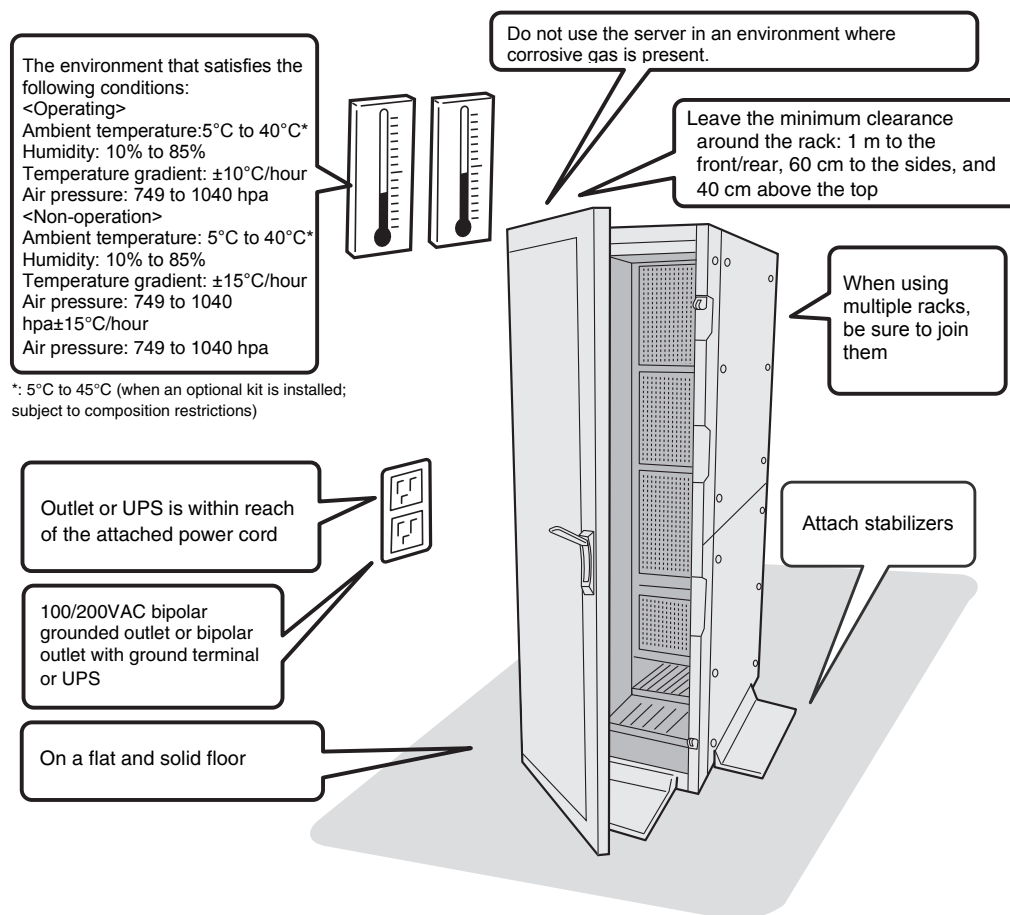
This server must be mounted to a rack which conforms to EIA standards for use.

2.1.1 Installing rack

Refer to the manual that comes with your rack for how to install the rack.

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

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






Do not install the rack or server under the following environment.

- Narrow space
- Place that cannot bear the total weights of the rack
- Place where stabilizers cannot be installed
- 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, and so on) exist
- Place where the air (or dust) includes components accelerating corrosion (sulfur, sodium chloride, and so on) 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, such as contact spark at power-on/power-off of commercial power supply through a relay

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


Mount the server to the rack.



 **WARNING**



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

- Do not 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, refer to *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.

About temperature increases and airflow in the rack

Review airflow in the rack and room 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) Installation

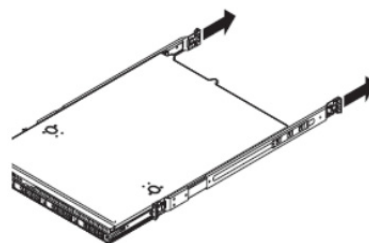
Mount the server to a rack in the following procedure.

- **Preparation for mounting**

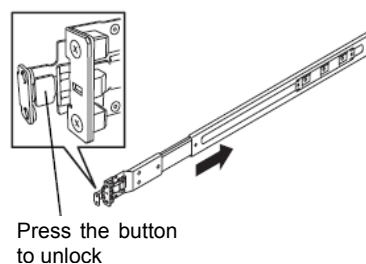
Remove the tape that attached slide rails before mounting it to the rack.

- **Removing outer rails**

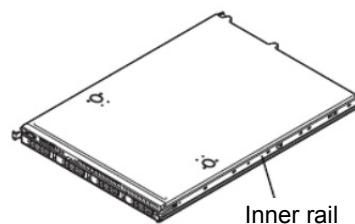
1. Remove the slide rails from left and right sides of the server.



2. While pressing the unlock button at the front of the server, hold the rail and slowly slide it backward.



3. After removing the outer rail, only the inner rail is screwed to the server.



Important Be careful to prevent your fingers being caught by the rail.

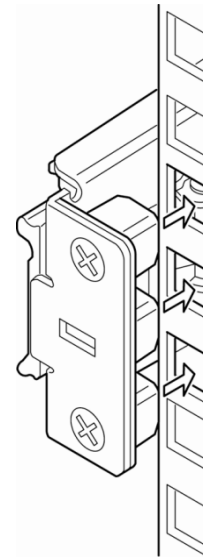
- **Installing outer rail**

Attach the outer rail you previously removed to the rack.

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

Right figure shows the front right side of the rack. Install to the rear right side and front and rear left sides following the same procedure.

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



Important Confirm that the rails are securely locked.

- **Installing the server**

Install the server by inserting the inner rail of this server into the outer rail attached to the rack and pushing the server in slowly.

Be careful that this server does not interfere with the servers installed above and below.

Be especially careful if the outer rails are attached to the rack by screws. In this case, adjust the position of the outer rail screws to leave a gap between servers so that the screws do not interfere with this server. If there is still a possibility that this server might interfere with another server, adjust the installation position such as by leaving a gap of 1U between this server and the other servers.

⚠ CAUTION



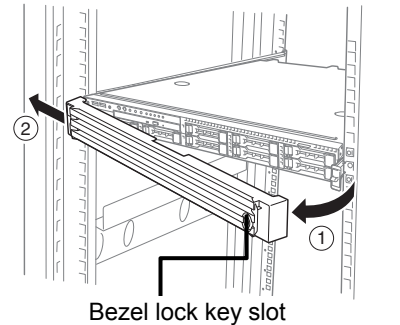
Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety Precautions and Regulatory Notices*.

- Do not drop.
- Do not leave the server being pulled out.
- Do not install with the cover removed.
- Do not get your fingers caught.

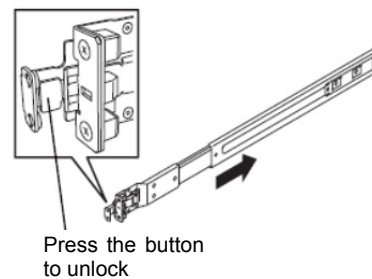
(2) Removal procedure

Remove the server from the rack in the following procedure. It is recommended more than one person work on this together.

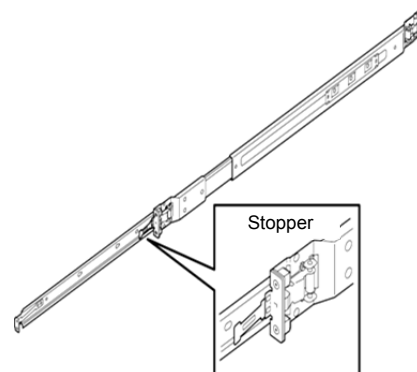
1. Turn off the server, and then disconnect the power cord and all cables from the server.
2. Unlock the front bezel and remove it.



3. Slowly pull the server out while pressing the unlock buttons located on either side of the front of the server.



4. The server will come to a stop halfway. Press and hold the stoppers on the rails and pull the server out of the rack.



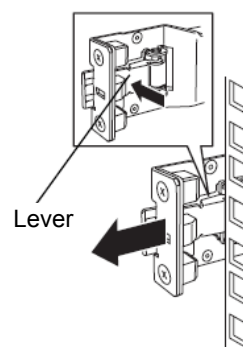
Important Be careful not to get your fingers caught in the rails and levers.

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.

6. Pull the rail in the direction of the arrows while pressing the lever.



(3) Removing outer rails

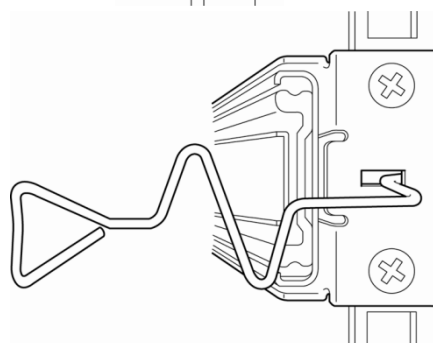
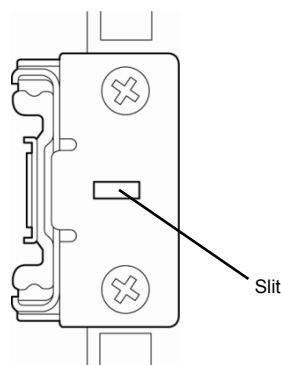
If multiple rails are installed and the unlock lever cannot be pushed, remove the rail from the rack by using the following procedure.

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

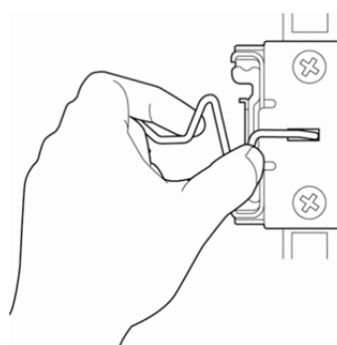
2. Prepare the designated tool to remove slide rail (outer rail) that comes with the server.



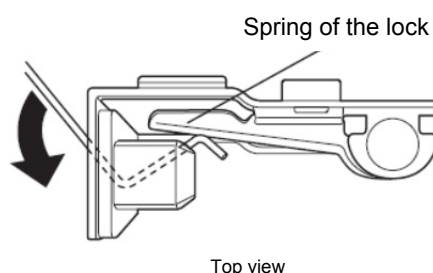
3. Insert the tool into the slit at the front of a rail as shown in the right figure.



4. Unlock the rail by moving the tool in the direction as shown in the right figure.

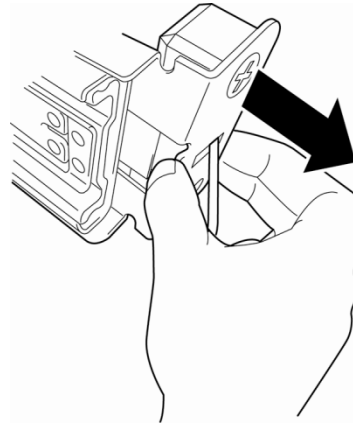


Front view

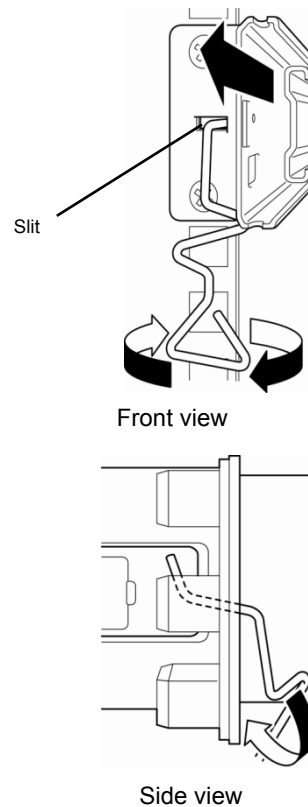


Top view

5. Remove the rail from the rack while it is being unlocked.







6. Insert the tool into the slit at the rear of the rail in the direction described. Rotate the tool to unlock it as shown in the right figure.
7. Remove the rail while it is being unlocked.

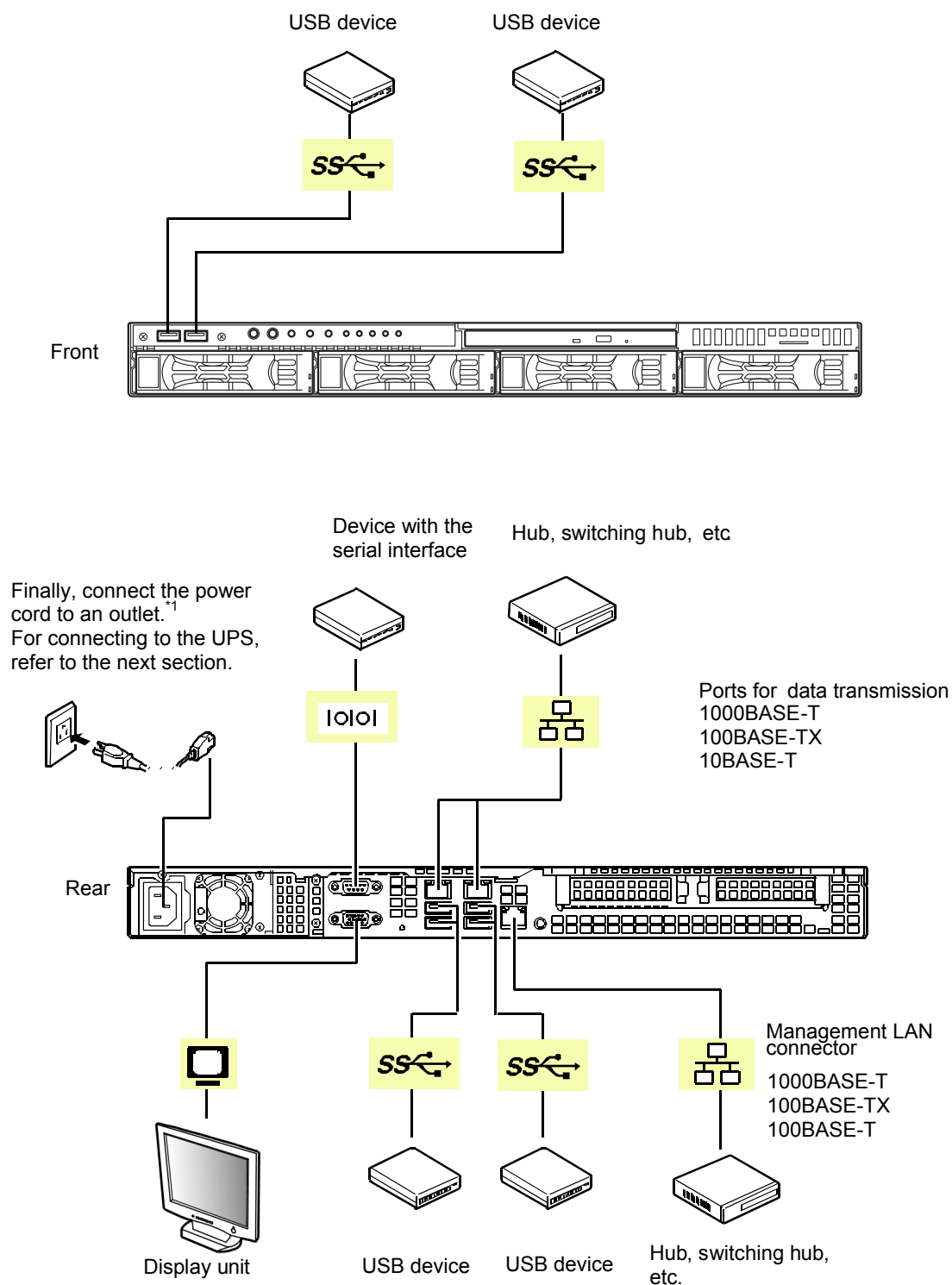


2.2 Connection

Connect peripheral devices to the server. Connectors that enable a variety of peripheral devices to be connected are provided at the front and rear of the server. Figures on the following pages show the peripheral devices that can be connected as standard. Connect the peripheral devices before connecting the power cord to the server.

 WARNING	
	<p>Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, refer to <i>Safety Precautions and Regulatory Notices</i>.</p> <ul style="list-style-type: none"> Do not hold the power plug with wet hands Do not connect the ground wire to a gas pipe

 CAUTION	
	<p>Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to <i>Safety Precautions and Regulatory Notices</i>.</p> <ul style="list-style-type: none"> 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

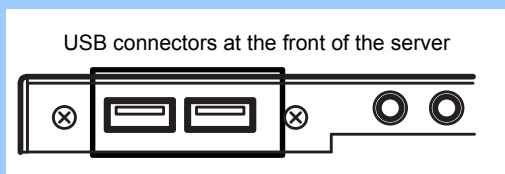


^{*1} Connect the power cord to a circuit breaker of up to 15A.
To prevent power cord from disconnecting, secure the power cord with the provided cable tie.

Important**Use of external USB devices**

If you connect an external USB DVD-ROM drive to a USB connector at the front of the server, do not connect any other device to the adjacent USB port.

* The ports in a box in the images below are “adjacent USB ports”.



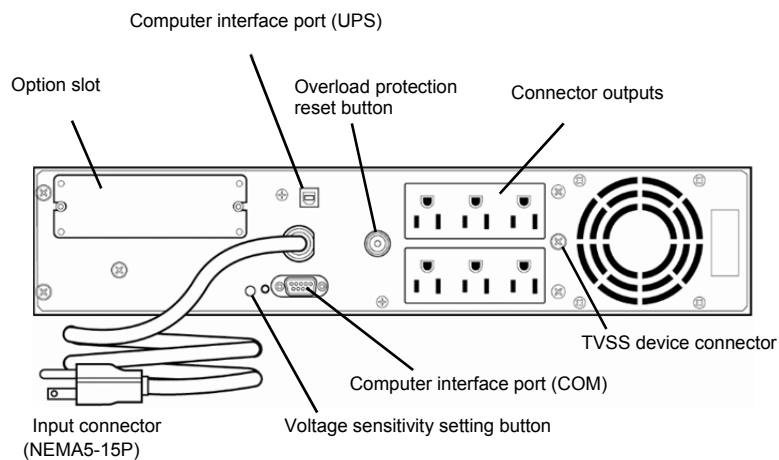
Note the following precautions to connect cables

- Turn off the server and peripheral 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 so that it does not touch the rack door or side guide rail.
- Make sure that no pressure is applied on the plug of power cord.
- A leased line cannot be directly connected to the serial port connector. If you connect a card to a line, use the card which you have applied for with the certification authority.
- The connectors that are not described in this section are unused connectors. Do not connect them all.

2.2.1 Connecting to a uninterruptible power supply (UPS)

To connect to the uninterruptible power supply (UPS), use the connector output on the rear of the UPS. For details, refer to the manual supplied with the UPS.

Example



To change the settings for linking the power supply of UPS, select **Server** and then **AC-LINK** in the BIOS setup utility, and change the displayed parameters. Select **Power On** to perform automatic operations by using the UPS. For details, see *Chapter 2 (1.2.4 Server)* in "Maintenance Guide".

NEC Express5800 Series Express5800/R110i-1

3

Setup

This chapter describes how to set up the server.

1. Turning on the Server

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

2. 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. See *Chapter 2 (6. Details of EXPRESSBUILDER)* in *Maintenance Guide*.

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

Turn on the server by using the following procedure.

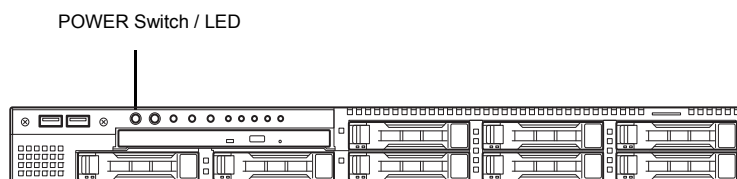
Tips

After connecting the power cord or turning off the server, wait for at least 30 seconds before turning on the server.

1. Turn on a display, an Uninterruptible Power Supply (UPS), and other peripherals.
2. Remove the front bezel.
3. If POWER LED lights amber, wait until POWER LED is unlit.
4. Press POWER Switch at the front of the server.
POWER LED is turned on green and after a while, NEC logo appears on the display.

Important

Do not turn off the server before the NEC logo is displayed.



While the logo is being displayed, the self-diagnostic program (POST) runs and diagnoses the hardware. For details, see *Chapter 3 (1.1.1 POST process)*.

Important

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

1.1 POST

Power-On Self-Test (POST) is a self-diagnostic program stored in the server as standard. POST automatically runs after the server is turned on and checks the motherboard, memory, processor (CPU), keyboard, and other hardware. POST also displays the messages of utilities to configure PCI devices.

Usually, you do not need to check the message of POST. 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 POST
- When any error message is displayed

1.1.1 POST process

Note

- Do not perform key input or mouse operation except by the methods indicated in the manual while POST is running.
- Depending on changing PCI cards, the error message is displayed and POST stops. In this case, press <F1> key to continue POST.

1. POST runs automatically when the server is turned on.

NEC logo appears on the screen as factory settings.



Note

- Keyboard becomes operable after the logo appears.
- While the POST is running, ignore even if the screen is sometimes switched to the black screen.
- Initialization messages are not displayed depending on settings of BIOS and hardware configuration.
- Initialization messages are not displayed on the console redirection screen of a serial port.

2. When **Password On Boot** is **Enabled** in BIOS settings, the password entry appears.

If you enter the wrong password three times, POST stops and you cannot proceed. In this case, turn off and on the server.

Important

Do not set a password before installing the OS.

3. When <Esc> key is pressed, the logo disappears and the details of POST are displayed.

Tips

To show the details of POST without pressing <ESC> key, set **Quiet Boot** to **Disabled** in BIOS settings.

4. POST displays the result of memory test, CPU status, and other messages.

Tips

The memory capacity shown in the message is smaller than the actual physical memory depending on the hardware configuration.

- After a while, the following message is displayed on the screen.

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

Tips

When **Server** → **Power Measurement Policy** is **One time** or **Always**, the power measurement message appears instead of the above message. Wait until the measurement is complete.

You can call the following functions by pressing the function key.

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

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

Note

Note that the server does not boot from Internal Flash Memory when a bootable CD/DVD-ROM is set on the drive.

<F4> key: Run the offline tool. For details, see *Chapter 1 (9. Offline Tools) in "Maintenance Guide"*.

<F12> key: Boot from network.

- When the boot mode is legacy BIOS and a controller which has the dedicated BIOS is installed, a message that prompts you to start the utility is displayed.

Example: optional RAID controller

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

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

Example: on-board RAID controller

Press <Ctrl> <M> to Run LSI Software RAID Configuration Utility

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

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

Depending on the hardware 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.

- The password entry appears when you set a password in BIOS Setup Utility. Up to three password entries will be accepted. Three incorrect password entries disable the server to boot. In such a case, turn off the power and wait about ten seconds before turning on to boot the server.

Important

Do not set a password before installing the OS.

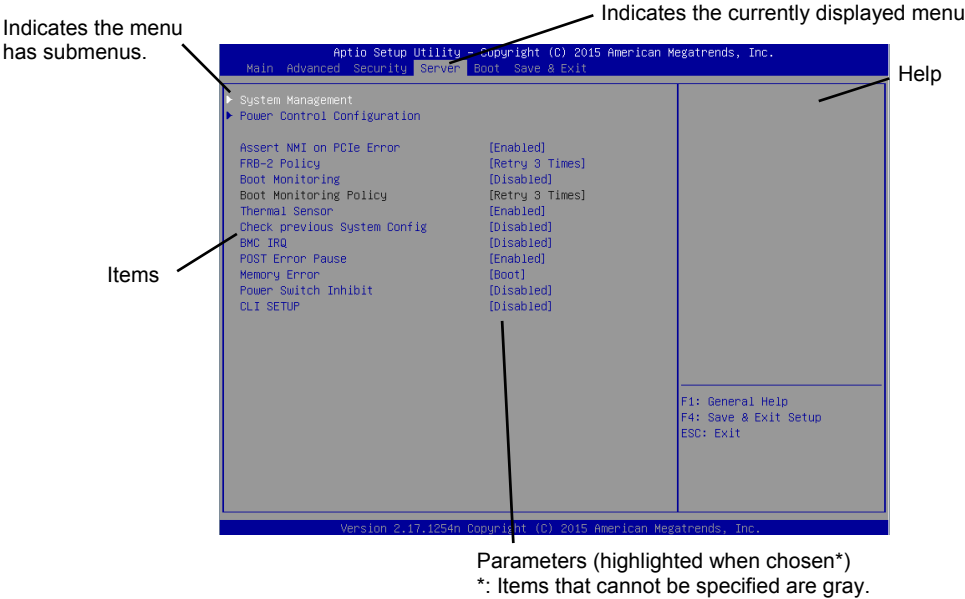
- If the error message of incorrect signature is displayed and POST stops, turn off the server and check if the bootable device (or bootable media) is correct.
- The OS starts when POST is completed.

1.1.2 POST error messages

If POST detects an error, the error message is displayed on the screen or beeps are sounded. Write down the error message for future use. For details, see *"Maintenance Guide"*.

2.3 Usage of SETUP

Use the following keys to operate SETUP.



- ☐ Cursor keys (<↑>, <↓>)
Chooses an item displayed on the screen. If characters of an item are highlighted, that means the item is currently chosen.
 - ☐ Cursor keys (<←>, <→>)
Chooses menus including **Main**, **Advanced**, **Security**, **Server**, **Boot**, and **Save & Exit**.
 - ☐ <→> key/<+> key
Changes the parameter of the chosen item. You cannot use this key when a menu which has ► on the left is chosen.
 - ☐ <Enter> key
Determines the chosen parameter.
 - ☐ <Esc> key
Returns to the previous screen. If you choose **Yes** in the following message, SETUP closes without saving the changes.
- | | |
|----------------------|----|
| Quit without saving? | |
| [Yes] | No |
- ☐ <F1> key
Displays help information. Press <Esc> key to go back to the original screen.

☐ <F2> key

Restores the parameters. If you choose **Yes** in the following message, the previous parameter(s) are restored.

Load Previous Values?
[Yes] No

☐ <F3> key

Loads default settings. If you choose **Yes** in the following message, the default settings of SETUP are restored. **The default settings are different from the factory settings.** See *Chapter 2 (1. System BIOS)* in "Maintenance Guide" for details.

Load Setup Defaults?
[Yes] No

Tips

The parameters of **Advanced** → **iSCSI Configuration** and **UEFI Driver Configuration** are not returned to the default value.

☐ <F4> key

Saves parameters. If you choose **Yes** in the following message, the parameters you configured are saved and SETUP closes.

Save configuration and exit?
[Yes] No

2.4 Cases that Require Changes

Use SETUP to change a parameter in the following cases. Other than cases described below, do not change the settings. The 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	Main → System Date Main → System Time	Configurable on OS
	On/Off NumLock on power ON	Boot → Bootup Numlock State	
	On/Off the function to display NEC logo during POST	Boot → Quite Boot → Disabled	By pressing <Esc> key, prevent the display of the logo.
Memory	Configure the memory after the DIMM is added or exchanged.	Advanced → Memory Configuration → Memory Retest → Yes	After rebooting, the Memory Retest setting changes to No automatically.
Optional board	Install RAID Controller board	Advanced → PCI Configuration → PCI Device Controller and Option ROM Settings → PCI Slot n Option ROM → Enabled	n is PCI slot number of the RAID Controller
	When an optional board is installed, set to [Disabled] for Option ROM for all PCI devices except for the boot device.	Advanced → PCI Configuration → PCI Device Controller and Option ROM Settings → PCI Slot n Option ROM → Enabled	"n": Slot number in the PCI device (except for the boot device)
		Advanced → PCI Configuration → PCI Device Controller and Option ROM Settings → LAN1 Option ROM Scan → Disabled	Option ROM on LAN1 must be disabled.
Boot	Set to UEFI in Boot mode depending on the installed OS.	Boot → Boot Mode → UEFI The following OS must be set to UEFI: — Windows Server 2016 — Windows Server 2012 — Windows Server 2012 R2 — VMware ESXi 6 — VMware ESXi 6.5 Later	For details, see <i>Installation Guide</i> .
	Set to Legacy in Boot mode depending on the installed OS.	Boot → Boot Mode → Legacy The following OS must be set to Legacy: — Windows Server 2008 R2	For details, see <i>Installation Guide</i> .
	Change the boot order of devices	Boot → Boot Option Priorities → Change the boot priority	
	Use remote power on feature (from modem)	Advanced → Advanced Chipset Configuration → Wake On Ring → Enabled	
	Use remote power on feature (from RTC alarm)	Advanced → Advanced Chipset Configuration → Wake On RTC Alarm → Enabled	
	Control from HW console terminal	Advanced → Serial Port Configuration → Change respective setting.	

Category	Description	To be changed	Remark
Boot	Set to Enabled in X2APIC depending on the installed OS.	Advanced → Processor Configuration → X2APIC → Enabled The following OS must be set to Enabled: — Windows Server 2016 — Windows Server 2012 — Windows Server 2012 R2 — VMware ESXi 6 — VMware ESXi 6.5 Later	For details, see <i>Installation Guide</i> .to select Enabled or Disabled .
	Set to Disabled in X2APIC depending on the installed OS.	Advanced → Processor Configuration → X2APIC → Disabled The following OS must be set to Disabled: — Windows Server 2008 R2	For details, see <i>Installation Guide</i> .to select Enabled or Disabled .
Security	Set a password to restrict operation of SETUP.	Security → Administrator Password → Security → User password	After a password is set, the entry of password is displayed when SETUP is launched.
	Set a password to restrict booting.	Security → Password on Boot → Enabled	You can select this parameter after you set a password.
	Use Trusted Boot (TBOOT) with an optional TPM kit.	Security → Trusted Computing Set to Enabled in the following items: - TPM Support - TPM State - TXT Support	If TXT Support is Enabled and the OS is started, do not disable TPM by a TPM management tool. If disable TPM, TPM Support or TXT Support cannot be changed. In such a case, Select Save & Exit → Load Setup Defaults .
UPS Powerlink	When the server is supplied with power from UPS, always turn on the power.	Server → Power Control Configuration → AC-LINK → Power On	
	If the server is turned off by using POWER switch, leave it OFF even when UPS supplies power.	Server → Power Control Configuration → AC-LINK → Last State	
	Keep the power OFF even when UPS supplies power.	Server → Power Control Configuration → AC-LINK → Stay off	

3. EXPRESSSCOPE ENGINE 3

3.1 Overview

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.

3.2 EXPRESSSCOPE ENGINE 3 Network Configuration

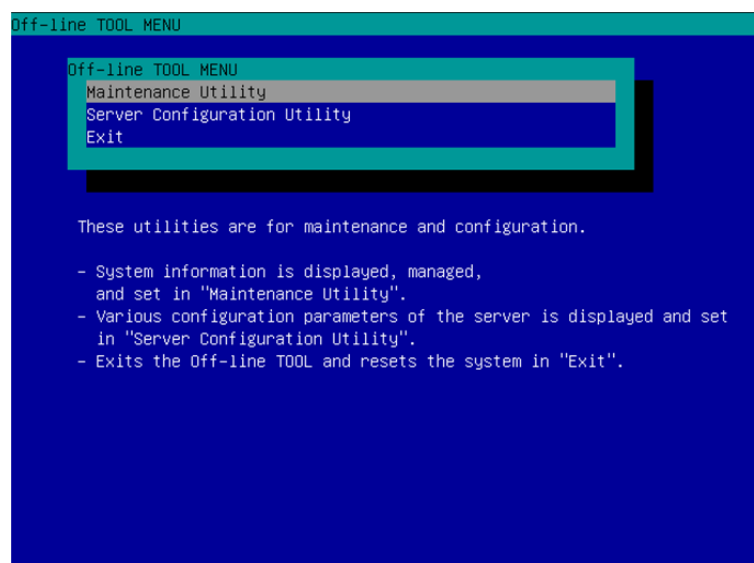
Take the steps below to use EXPRESSSCOPE Engine 3 through the Web browser.

1. Run POST following *Chapter 3 (1.1.1 POST process)*. 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.

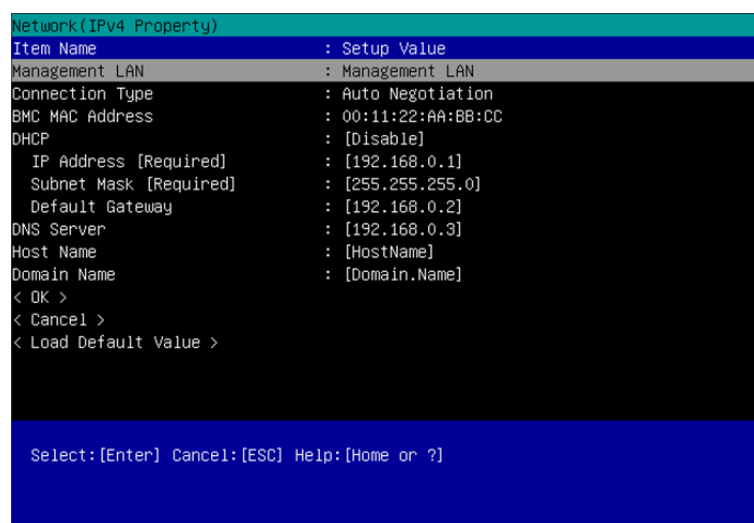
4. On Off-line TOOL MENU, select **Server Configuration Utility** → **EXPRESSSCOPE Engine 3** → **Configuration** → **Network** → **IPv4 Property** or **IPv6 Property**.



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.

4. EXPRESSBUILDER

EXPRESSBUILDER helps you to install Windows or maintain the server.

4.1 Features of EXPRESSBUILDER

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, choose OS installation in Boot Selection Menu.
Bundled software	Stores NEC ESM PRO, Universal RAID Utility, and other bundled software .
Maintenance	Diagnoses the server. To use this feature, choose Tool menu in Boot Selection Menu.
Manuals	Stores <i>User's Guide</i> , <i>Installation Guide</i> , <i>Maintenance Guide</i> , and other manuals.

4.2 Usage of EXPRESSBUILDER

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

You can run EXPRESSBUILDER by clicking the shortcut of NEC EXPRESSBUILDER on the desktop, or select NEC EXPRESSBUILDER from Windows Start menu or Start screen after installing Windows and Starter Pack.

EXPRESSBUILDER DVD:

DVD does not come with the product. Purchase the option or 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.

5. Installing Software Components

Continue to install the operating system and other bundled software.

See the instructions below.

- *Installation Guide (Windows)*

6. Turning off the Server

Turn off the server by using the following procedure. When 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. If the server does not automatically power off, press POWER Switch at the front of the server.
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/R110i-1

4

Appendix

1. Specifications

Describes specifications of the server.

2. Interrupt Lines

Describes the interrupt lines assigned to this server.

3. Glossary

4. Revision Record

1. Specifications

1.1 2.5-inch Drive Model

Product name			Express5800/R110i-1, EXP335A		
Model			N8100-2537F		
CPU	Type	Intel Pentium processor G4560	Intel Xeon processor E3-1220 v6	Intel Xeon processor E3-1225 v6	
	Clock	3.5GHz	3GHz	3.3GHz	
	Standard/Maximum	1/1			
	Number of cores/ Number of threads (T) (1 CPU)	2C/4T	4C/4T		
Chipset		Intel C236 chipset			
Memory	Standard/Maximum		Not pre-installed (installation required)/64 GB (4 x 16 GB)		
	Memory module		DDR4-2400 SDRAM DIMM, unbuffered		
	Maximum clock		2400 MHz		
	Error check, correction		ECC		
Auxiliary storage	Drive bay	Standard	-		
		Maximum ^{*3}	2.5-inch HDD: SATA 16 TB (8 x 2 TB), SAS 19.2 TB (8 x 2.4 TB) 2.5-inch SSD: SATA 12.8 TB (8 x 1.6 TB), SAS 3.2 TB (8 x 400 GB)		
		Hot swap	Supported		
	Interface level/ RAID System		SATA 6 Gb/s: RAID 0/1/10 (standard), RAID 5/6/50 (optional) SAS 12 Gb/s: RAID 0/1/5/6/10/50 (optional)		
	Optical disk drive		Internal/external drive (optional) *1		
	Expansion slots	Additional bay		-	
Supported slot		1x PCI EXPRESS 3.0 (x16 lanes, x16 sockets) + 2x PCI EXPRESS 3.0 (x4 lanes, x8 sockets) (Low profile, 173 mm)			
Graphics	Chip/VideoRAM		Management controller chip/32 MB		
	Graphic display/ resolution		16,770,000 colors: 640 x 480, 800 x 600, 1,024 x 768, 1,280 x1,024		
Interface		1x analog RGB (MiniD-Sub15 pins, 1 x rear) 1x serial port (RS-232C compliant/D-Sub 9 pins, serial port A, 1 x rear, optional port can be used (up to two ports in total)) 7 x USB 3.0 (2 x front, 4 x rear, 1 x internal) 2 x 1000 Base-T/100 Base-TX/10 Base-T (RJ-45) 1x1000Base-T/100Base-TX/10Base-T(RJ-45):Management LAN exclusive use.			
Redundant power supply		-			
Redundant fan		Supported (optional)			
External dimensions (width × depth × height)		444.0 x 615.2 x 43.6 mm (protrusions not included) 482.4 x 678.2 x 44.1 mm (front bezel/ protrusions/ inner rails included) 482.4 x 681.0 x 44.1 mm (dust proof bezel/ protrusions/ inner rails included)			
Weight (Standard/Max.)		10 kg/17.5 kg (including rails)			

Product name	Express5800/R110i-1, EXP335A
Model	N8100-2537F
Power supply	2 x 500 W 80 PLUS Gold compliant (bipolar grounded outlet) (hot-plug available) 100/200 VAC \pm 10%, 50/60 Hz \pm 3 Hz (power cable must be selected)
Power rating	513 W
Environmental requirements Temperature/Humidity	Operating: 5 to 40°C (when an option is installed: 5 to 45°C(it's subject to composition restrictions.))/10 to 85%, Storage: -10 to 55°C/10 to 85% (no condensation either when operating or when stored)
Accessories	Getting Started, One-touch rack rail (mounted on the server as standard), Power cord
Installed OS	—
Supported OSs	Microsoft Windows Server 2008 R2 Standard (x64) 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 Microsoft Windows Server 2016 Standard Microsoft Windows Server 2016 Datacenter

*1 If you do not intend to install a built-in DVD-ROM or DVD SuperMULTI, prepare an external DVD-ROM for maintenance and OS reinstallation purposes.

Product name			Express5800/R110i-1, EXP335A			
Model			N8100-2537F			
CPU	Type		Intel Xeon processor E3-1230 v6	Intel Xeon processor E3-1240L v5	Intel Xeon processor E3-1260L v5	Intel Xeon processor E3-1270 v6
	Clock		3.5GHz	2.1GHz	2.9GHz	3.8GHz
	Standard/Maximum		1/1			
	Number of cores/ Number of threads (T) (1 CPU)		4C/8T			
Chipset			Intel C236 chipset			
Memory	Standard/Maximum		Not pre-installed (installation required)/64 GB (4 x 16 GB)			
	Memory module		DDR4-2400 SDRAM DIMM, unbuffered			
	Maximum clock		2400 MHz	2133 MHz		2400 MHz
	Error check, correction		ECC			
Auxiliary storage	Drive bay	Standard	—			
		Maximum*3	2.5-inch HDD: SATA 16 TB (8 x 2 TB), SAS 19.2 TB (8 x 2.4 TB) 2.5-inch SSD: SATA 12.8 TB (8 x 1.6 TB), SAS 3.2 TB (8 x 400 GB)			
		Hot swap	Supported			
	Interface level/ RAID System		SATA 6 Gb/s: RAID 0/1/10 (standard), RAID 5/6/50 (optional) SAS 12 Gb/s: RAID 0/1/5/6/10/50 (optional)			
	Optical disk drive		Internal/external drive (optional) *1			
Expansion slots	Additional bay		—			
	Supported slot		1x PCI EXPRESS 3.0 (x16 lanes, x16 sockets) + 2x PCI EXPRESS 3.0 (x4 lanes, x8 sockets) (Low profile, 173 mm)			
Graphics	Chip/VideoRAM		Management controller chip/32 MB			
	Graphic display/ resolution		16,770,000 colors: 640 x 480, 800 x 600, 1,024 x 768, 1,280 x1,024			
Interface			1x analog RGB (MiniD-Sub15 pins, 1 x rear) 1x serial port (RS-232C compliant/D-Sub 9 pins, serial port A, 1 x rear, optional port can be used (up to two ports in total)) 7 x USB 3.0 (2 x front, 4 x rear, 1 x internal) 2 x 1000 Base-T/100 Base-TX/10 Base-T (RJ-45) 1x1000Base-T/100Base-TX/10Base-T(RJ-45):Management LAN exclusive use.			
Redundant power supply			—			
Redundant fan			Supported (optional)			
External dimensions (width × depth × height)			444.0 x 615.2 x 43.6 mm (protrusions not included) 482.4 x 678.2 x 44.1 mm (front bezel/ protrusions/ inner rails included) 482.4 x 681.0 x 44.1 mm (dust proof bezel/ protrusions/ inner rails included)			
Weight (Standard/Max.)			10 kg/17.5 kg (including rails)			

Product name	Express5800/R110i-1, EXP335A
Model	N8100-2537F
Power supply	2 x 80 PLUS Gold compliant (bipolar grounded outlet) (hot-plug available) 100/200 VAC \pm 10%, 50/60 Hz \pm 3 Hz (power cable must be selected)
Power rating	513 W
Environmental requirements Temperature/Humidity	Operating: 5 to 40°C (when an option is installed: 5 to 45°C(it's subject to composition restrictions.))/10 to 85%, Storage: -10 to 55°C/10 to 85% (no condensation either when operating or when stored)
Accessories	Getting Started, One-touch rack rail (mounted on the server as standard), Power cord
Installed OS	—
Supported OSs	Microsoft Windows Server 2008 R2 Standard (x64) 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 Microsoft Windows Server 2016 Standard Microsoft Windows Server 2016 Datacenter

*1 If you do not intend to install a built-in DVD-ROM or DVD SuperMULTI, prepare an external DVD-ROM for maintenance and OS reinstallation purposes.

1.2 3.5-inch Drive Model

Product name			Express5800/R110i-1, EXP335		
Model			N8100-2359F		
CPU	Type		Intel Pentium processor G4560	Intel Xeon processor E3-1220 v6	Intel Xeon processor E3-1225 v6
	Clock		3.5GHz	3GHz	3.3GHz
	Standard/Maximum		1/1		
	Number of cores/ Number of threads (T) (1 CPU)		2C/4T	4C/4T	
Chipset			Intel C236 chipset		
Memory	Standard/Maximum		Not pre-installed (installation required)/64 GB (4 x 16 GB)		
	Memory module		DDR4-2400 SDRAM DIMM, unbuffered		
	Maximum clock		2400 MHz		
	Error check, correction		ECC		
Auxiliary storage	Drive bay	Standard	—		
		Maximum*3	3.5-inch HDD: SATA 48 TB (4 x 12 TB)		
		Hot swap	Supported		
	Interface level/RAID System		SATA 6 Gb/s: RAID 0/1/10 (standard*1), RAID 5/6 (optional)		
	Optical disk drive		Internal/external drive (optional) *2		
	Additional slots	Additional bay		—	
Supported slots		1x PCI EXPRESS 3.0 (x16 lanes, x16 sockets) + 2x PCI EXPRESS 3.0 (x4 lanes, x8 sockets) (Low profile, 173 mm)			
Graphics	Chip/VideoRAM		Management controller chip/32 MB		
	Graphic display/resolution		16,770,000 colors: 640 x 480, 800 x 600, 1,024 x 768, 1,280 x 1,024		
Interface			1x analog RGB (MiniD-Sub15 pins, 1 x rear) 1x serial port (RS-232C compliant/D-Sub9 pin, serial port A, 1 x rear, optional port can be used (up to two ports in total)) 7 x USB 2.0 (2 x front, 4 x rear, 1 x internal) 2 x 1000 Base-T/100 Base-TX/10 Base-T (RJ-45) 1x1000Base-T/100Base-TX/10Base-T(RJ-45):Management LAN exclusive use.		
Redundant power supply			—		
Redundant fan			Supported (optional)		
External dimensions (width × depth × height)			444.0 x 615.2 x 43.6 mm (protrusions not included) 482.4 x 678.2 x 44.1 mm (front bezel/ protrusions/ inner rails included) 482.4 x 681.0 x 44.1 mm (dust proof bezel/ protrusions/ inner rails included)		
Weight (Standard/Max.)			10 kg/17.5 kg (including rails)		
Power supply			1 x 80 PLUS Platinum compliant (bipolar grounded outlet) (hot-plug unavailable) 100/200 VAC ± 10%, 50/60 Hz ± 3 Hz (power cable must be selected)		
Power rating			462 W		

Product name		Express5800/R110i-1, EXP335
Model		N8100-2359F
Environmental requirements Temperature/Humidity		Operating: 5 to 40°C (when an option is installed: 5 to 45°C(it's subject to composition restrictions.))/10 to 85%, Storage: -10 to 55°C/10 to 85% (no condensation either when operating or when stored)
Accessories		Getting Started, One-touch rack rail (mounted on the server as standard), Power cord
Installed OS		—
Supported OSs	OSs supported by NEC	Microsoft Windows Server 2008 R2 Standard (x64) 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 Microsoft Windows Server 2016 Standard Microsoft Windows Server 2016 Datacenter

*1 When using an onboard RAID configuration, RAID10 is not supported if an additional 2 TB HDD is installed.

*2 If you do not intend to install a built-in DVD-ROM or DVDSuperMULTI, prepare an external DVD-ROM for maintenance and OS reinstallation purposes.

Product name			Express5800/R110i-1, EXP335				
Model			N8100-2359F				
CPU	Type		Intel Xeon processor E3-1230 v6	Intel Xeon processor E3-1240L v5	Intel Xeon processor E3-1260L v5	Intel Xeon processor E3-1270 v6	
	Clock		3.5GHz	2.1GHz	2.9GHz	3.8GHz	
	Standard/Maximum		1/1				
	Number of cores/ Number of threads (T) (1 CPU)		4C/8T				
Chipset			Intel C236 chipset				
Memory	Standard/Maximum		Not pre-installed (installation required)/64 GB (4 x 16 GB)				
	Memory module		DDR4-2400 SDRAM DIMM, unbuffered				
	Maximum clock		2400 MHz	2133 MHz		2400 MHz	
	Error check, correction		ECC				
Auxiliary storage	Drive bay	Standard	-				
		Maximum*3	3.5-inch HDD: SATA 48 TB (4 x 12 TB)				
		Hot swap	Supported				
	Interface level/RAID System		SATA 6 Gb/s: RAID 0/1/10 (standard*1), RAID 5/6 (optional)				
	Optical disk drive		Internal/external drive (optional) *2				
	Additional slots	Additional bay		-			
		Supported slots		1x PCI EXPRESS 3.0 (x16 lanes, x16 sockets) + 2x PCI EXPRESS 3.0 (x4 lanes, x8 sockets) (Low profile, 173 mm)			
Graphics	Chip/VideoRAM		Management controller chip/32 MB				
	Graphic display/resolution		16,770,000 colors: 640 x 480, 800 x 600, 1,024 x 768, 1,280 x 1,024				
Interface			1x analog RGB (MiniD-Sub15 pins, 1 x rear) 1x serial port (RS-232C compliant/D-Sub9 pin, serial port A, 1 x rear, optional port can be used (up to two ports in total)) 7 x USB 2.0 (2 x front, 4 x rear, 1 x internal) 2 x 1000 Base-T/100 Base-TX/10 Base-T (RJ-45) 1x1000Base-T/100Base-TX/10Base-T(RJ-45):Management LAN exclusive use.				
Redundant power supply			-				
Redundant fan			Supported (optional)				
External dimensions (width x depth x height)			444.0 x 615.2 x 43.6 mm (protrusions not included) 482.4 x 678.2 x 44.1 mm (front bezel/ protrusions/ inner rails included) 482.4 x 681.0 x 44.1 mm (dust proof bezel/ protrusions/ inner rails included)				
Weight (Standard/Max.)			10 kg/17.5 kg (including rails)				
Power supply			1 x 80 PLUS Platinum compliant (bipolar grounded outlet) (hot-plug unavailable) 100/200 VAC ± 10%, 50/60 Hz ± 3 Hz (power cable must be selected)				
Power rating			462 W				

Product name		Express5800/R110i-1, EXP335
Model		N8100-2359F
Environmental requirements Temperature/Humidity		Operating: 5 to 40°C (when an option is installed: 5 to 45°C(it's subject to composition restrictions.))/10 to 85%, Storage: -10 to 55°C/10 to 85% (no condensation either when operating or when stored)
Accessories		Getting Started, One-touch rack rail (mounted on the server as standard), Power cord
Installed OS		—
Supported OSs	OSs supported by NEC	Microsoft Windows Server 2008 R2 Standard (x64) 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 Microsoft Windows Server 2016 Standard Microsoft Windows Server 2016 Datacenter

*1 When using an onboard RAID configuration, RAID10 is not supported if an additional 2 TB HDD is installed.

*2 If you do not intend to install a built-in DVD-ROM or DVDSuperMULTI, prepare an external DVD-ROM for maintenance and OS reinstallation purposes.

Product name			Express5800/R110i-1, EXP335A		
Model			N8100-2360F		
CPU	Type		Intel Pentium processor G4560	Intel Xeon processor E3-1220 v6	Intel Xeon processor E3-1225 v6
	Clock		3.5GHz	3GHz	3.3GHz
	Standard/Maximum		1/1		
	Number of cores/ Number of threads (T) (1 CPU)		2C/4T	4C/4T	
Chipset			Intel C236 chipset		
Memory	Standard/Maximum		Not pre-installed (installation required)/64 GB (4 x 16 GB)		
	Memory module		DDR4-2400 SDRAM DIMM, unbuffered		
	Maximum clock		2400 MHz		
	Error check, correction		ECC		
Auxiliary storage	Drive bay	Standard	—		
		Maximum*3	3.5-inch HDD: SATA 40 TB (4 x 10 TB)		
		Hot swap	Supported		
	Interface level/RAID System		SATA 6 Gb/s: RAID 0/1/10 (standard*1), RAID 5/6 (optional)		
	Optical disk drive		Internal/external drive (optional) *2		
	Additional slots	Additional bay		—	
Supported slots		1x PCI EXPRESS 3.0 (x16 lanes, x16 sockets) + 2x PCI EXPRESS 3.0 (x4 lanes, x8 sockets) (Low profile, 173 mm)			
Graphics	Chip/VideoRAM		Management controller chip/32 MB		
	Graphic display/resolution		16,770,000 colors: 640 x 480, 800 x 600, 1,024 x 768, 1,280 x 1,024		
Interface			1x analog RGB (MiniD-Sub15 pins, 1 x rear) 1x serial port (RS-232C compliant/D-Sub9 pin, serial port A, 1 x rear, optional port can be used (up to two ports in total)) 7 x USB 2.0 (2 x front, 4 x rear, 1 x internal) 2 x 1000 Base-T/100 Base-TX/10 Base-T (RJ-45) 1x1000Base-T/100Base-TX/10Base-T(RJ-45):Management LAN exclusive use.		
Redundant power supply			Supported		
Redundant fan			Supported (optional)		
External dimensions (width x depth x height)			444.0 x 615.2 x 43.6 mm (protrusions not included) 482.4 x 678.2 x 44.1 mm (front bezel/ protrusions/ inner rails included) 482.4 x 681.0 x 44.1 mm (dust proof bezel/ protrusions/ inner rails included)		
Weight (Standard/Max.)			10 kg/17.5 kg (including rails)		
Power supply			2 x 80 PLUS Gold compliant (bipolar grounded outlet) (hot-plug available) 100/200 VAC ± 10%, 50/60 Hz ± 3 Hz (power cable must be selected)		
Power rating			513 W		

Product name		Express5800/R110i-1, EXP335A
Model		N8100-2360F
Environmental requirements Temperature/Humidity		Operating: 5 to 40°C (when an option is installed: 5 to 45°C(it's subject to composition restrictions.))/10 to 85%, Storage: -10 to 55°C/10 to 85% (no condensation either when operating or when stored)
Accessories		Getting Started, One-touch rack rail (mounted on the server as standard), Power cord
Installed OS		—
Supported OSs	OSs supported by NEC	Microsoft Windows Server 2008 R2 Standard (x64) 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 Microsoft Windows Server 2016 Standard Microsoft Windows Server 2016 Datacenter

*1 When using an onboard RAID configuration, RAID10 is not supported if an additional 2 TB HDD is installed.

*2 If you do not intend to install a built-in DVD-ROM or DVDSuperMULTI, prepare an external DVD-ROM for maintenance and OS reinstallation purposes.

Product name			Express5800/R110i-1, EXP335A			
Model			N8100-2360F			
CPU	Type		Intel Xeon processor E3-1230 v6	Intel Xeon processor E3-1240L v5	Intel Xeon processor E3-1260L v5	Intel Xeon processor E3-1270 v6
	Clock		3.5GHz	2.1GHz	2.9GHz	3.8GHz
	Standard/Maximum		1/1			
	Number of cores/ Number of threads (T) (1 CPU)		4C/8T			
Chipset			Intel C236 chipset			
Memory	Standard/Maximum		Not pre-installed (installation required)/64 GB (4 x 16 GB)			
	Memory module		DDR4-2400 SDRAM DIMM, unbuffered			
	Maximum clock		2400 MHz	2133 MHz		2400 MHz
	Error check, correction		ECC			
Auxiliary storage	Drive bay	Standard	—			
		Maximum*3	3.5-inch HDD: SATA 40 TB (4 x 10 TB)			
		Hot swap	Supported			
	Interface level/RAID System		SATA 6 Gb/s: RAID 0/1/10 (standard*1), RAID 5/6 (optional)			
	Optical disk drive		Internal/external drive (optional) *2			
	Additional slots	Additional bay		—		
Supported slots		1x PCI EXPRESS 3.0 (x16 lanes, x16 sockets) + 2x PCI EXPRESS 3.0 (x4 lanes, x8 sockets) (Low profile, 173 mm)				
Graphics	Chip/VideoRAM		Management controller chip/32 MB			
	Graphic display/resolution		16,770,000 colors: 640 x 480, 800 x 600, 1,024 x 768, 1,280 x 1,024			
Interface			1x analog RGB (MiniD-Sub15 pins, 1 x rear) 1x serial port (RS-232C compliant/D-Sub9 pin, serial port A, 1 x rear, optional port can be used (up to two ports in total)) 7 x USB 2.0 (2 x front, 4 x rear, 1 x internal) 2 x 1000 Base-T/100 Base-TX/10 Base-T (RJ-45) 1x1000Base-T/100Base-TX/10Base-T(RJ-45):Management LAN exclusive use.			
Redundant power supply			Supported			
Redundant fan			Supported (optional)			
External dimensions (width × depth × height)			444.0 x 615.2 x 43.6 mm (protrusions not included) 482.4 x 678.2 x 44.1 mm (front bezel/ protrusions/ inner rails included) 482.4 x 681.0 x 44.1 mm (dust proof bezel/ protrusions/ inner rails included)			
Weight (Standard/Max.)			10 kg/17.5 kg (including rails)			
Power supply			2 x 500 W 80 PLUS Gold compliant (bipolar grounded outlet) (hot-plug available) 100/200 VAC ± 10%, 50/60 Hz ± 3 Hz (power cable must be selected)			
Power rating			513 W			

Product name		Express5800/R110i-1, EXP335A
Model		N8100-2360F
Environmental requirements Temperature/Humidity		Operating: 5 to 40°C (when an option is installed: 5 to 45°C(it's subject to composition restrictions.))/10 to 85%, Storage: -10 to 55°C/10 to 85% (no condensation either when operating or when stored)
Accessories		Getting Started, One-touch rack rail (mounted on the server as standard), Power cord
Installed OS		—
Supported OSs	OSs supported by NEC	Microsoft Windows Server 2008 R2 Standard (x64) 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 Microsoft Windows Server 2016 Standard Microsoft Windows Server 2016 Datacenter

*1 When using an onboard RAID configuration, RAID10 is not supported if an additional 2 TB HDD is installed.

*2 If you do not intend to install a built-in DVD-ROM or DVDSuperMULTI, prepare an external DVD-ROM for maintenance and OS reinstallation purposes.

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	8	Real-time clock
1	–	9	Microsoft ACPI-Compliant System
2	Cascade connection	10	PCI
3	COM 2 serial port	11	PCI
4	COM 1 serial port	12	–
5	PCI	13	Arithmetic operation processor
6	–	14	–
7	–	15	–

3. Glossary

Term	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 Windows 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 multiple 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 read 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.

Term	Description
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 settings in this file when setting Windows with EXPRESSBUILDER.

***4.* Revision Record**

Revision (Document Number)	Date Issued	Description
10.116.03-101.01	April 2017	Newly created
10.116.03-101.02	May 2018	Support new RAID controller
	Aug 2018	Clerical corrections

NEC Express Server

Express5800/R110i-1
User's Guide

Aug 2018

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