NEC

User's Guide

NEC Express Server
Express5800 Series

Express5800/R120g-1E
EXP803

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

📄 Other manuals

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

Contents

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.
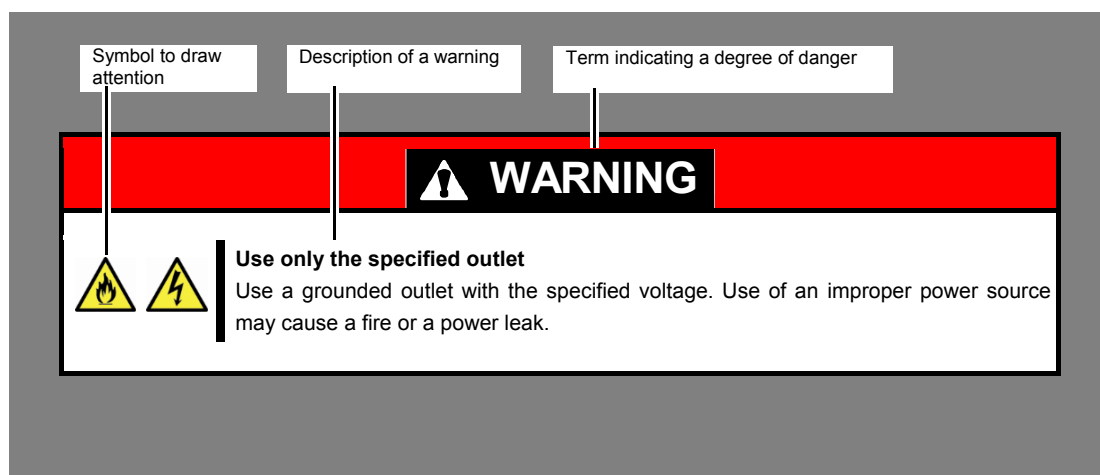
Notations used in the text

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, **server failure, data loss, and other serious malfunctions could occur**.
Note	Indicates items that must be confirmed when handling hardware or operating software.
Tips	Indicates information that is helpful to keep in mind when using this server.

Optical disk drive

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

- **DVD-ROM drive**
- **DVD Super MULTI drive**

Hard disk drive

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

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

Removable media

Unless otherwise stated, *removable media* described in this document refer to both of 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 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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UEFI NETWORK STACK 2

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This product includes cryptographic software written by Eric Young (eay@cryptsoft.com).
This product includes software written by Tim Hudson (tjh@cryptsoft.com).

CRYPTO PACKAGE USING WPA SUPPLICANT

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

http://www.nec.com/

Safety notes

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

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

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

Handling precautions

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

- **Do not use any cell phone or PHS and switch off them near the server. Electric waves from such devices can cause server to malfunction.**

- **Install the server in an appropriate place. For details about the installation location, see** *Chapter 2 Preparations (2. Installation and Connection)***.**

- **Before connecting/removing cables to/from peripheral devices, make sure that the server is off and unplug the power cord, if they are non plug-and-play devices.**

- **Connect the provided power cord to a 100/200 VAC outlet.**

- **Make sure that the access LED on the server is off before turning off the power or ejecting an optical disk.**

- **Wait for at least 30 seconds before connecting power cord to power outlet after disconnecting it.**

- **If any Uninterruptible Power Supply (UPS) unit is connected, set it to wait for at least 30 seconds before turning on the server after power off.**

- **Do not press the POWER switch to turn on the server before the STATUS LED 2 (amber) is unlit.**

- **Wait for at least 30 seconds before turning on the server after turning off the server.**

- **Turn off the server and unplug the power cord before moving it.**

- **Regularly clean the server to prevent various types of failure. See** *Chapter 1 Maintenance (2. Daily Maintenance)* **in "***Maintenance Guide***" for details.**

- **Momentary voltage drop may occur due to lightning strike. To prevent this, use of UPS is recommended.**

- **Any copy-protected CD that does not conform to standards is not supported.**

- **In the following cases, check and adjust the system clock before operation.**
    - After transportation
    - After storage
    - After the server is used following a period of disuse, in which storage conditions did not conform to those that guarantee server operations (temperature: 5 to 40°C; humidity: 20% to 80%).

- **Check the system clock approximately once per month. Use of a time server (NTP server) is recommended if high accuracy timing is required by the system.**

- **Observe the storage conditions (Temperature: –10°C to 55°C, Humidity: 20% to 80%, No condensation of moisture) to store the server.**

- **Do not power off or reset the server, nor disconnect the power cord before POST completes.**

- **If this server, internal optional devices, and media set for the backup devices (tape cartridges) are moved from a cold place to a warm place in a short time, condensation will occur and cause malfunctions and failures when these are used in such state. To protect important stored data and property, make sure to wait for a sufficient period to use the server and components in the operating environment.**

    Reference: Time effective at avoiding condensation in winter (more than 10°C differences between the room temperature and atmospheric temperature)

    Disk devices: Approximately 2 to 3 hours   Tape media: Approximately 1 day

- **This server does not support hibernation/standby feature.**
- **For optional devices, we recommend you use our NEC products. Even if they are successfully installed or connected, installation of unsupported devices can cause the server to malfunction or even failure. You will be charged to repair failure or damage caused by use of such products even within warranty period.**

Tips for your health and safety

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

Keep proper posture

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

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

Adjust the angle of your display

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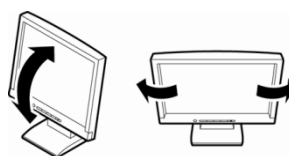
Adjust the brightness and contrast of the display

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

Adjust the angle of keyboard

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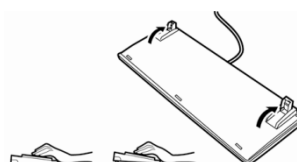
Clean your equipment

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

Take rest breaks

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

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NEC Express5800 Series
Express5800/R120g-1E

General Description

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

1. Introduction

2. Accessories
Describes the accessories of the server.

3. Features
Describes the features of the server and server management.

4. Names and Functions of Parts
Describes the name of each part contained in this server.

1. Introduction

Thank you for purchasing this NEC Express5800 Series product.

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

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

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

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

2. Accessories

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

- **Front Bezel**
- **Bezel Lock Key (attached to Front Bezel)**
- **Slide Rails**
- **Safety Precautions and Regulatory Notices**
- **Getting Started**

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

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

3. Features

The server has the following features:

High performance

- Intel® Xeon® processor
  - N8101-1029F : E5-2603 v4 (1.70GHz 6Core)
  - N8101-1030F : E5-2620 v4 (2.10GHz 8Core)
  - N8101-1031F : E5-2623 v4 (2.60GHz 4Core)
  - N8101-1032F : E5-2630 v4 (2.20GHz,10Core)
  - N8101-1036F : E5-2650 v4 (2.20GHz 12Core)
  - N8101-1037F : E5-2650L v4 (1.70GHz 14Core)
  - N8101-1045F : E5-2609 v4 (1.70GHz 8Core)
  - N8101-1046F : E5-2660 v4 (2.00GHz 14Core)
- Turbo Boost Technology feature *1
- Hyper Threading Technology feature *1
- High-speed memory access (DDR4 1866/2133/2400 supported) *2
- High-speed disk access (SATA 6Gbps / SAS 12GB/s supported)
- High-speed 10GBASE-SFP+ / 10GBASE-T / 1000BASE-T/100BASE-TX / 10BASE-T interface
  (10Gbps / 1Gbps / 100Mbps / 10Mbps supported)
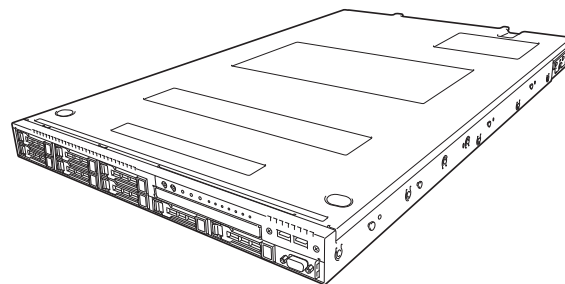
High reliability

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

Management Utilities

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

Power saving and noiseless design

- Selection of power unit appropriate to environment, work load, and configuration
- Power consumption monitoring feature
- Power control feature
- 80 PLUS® Platinum / Titanium certified high efficiency power supply *4
- Fan control appropriate to environment, work load, and configuration
- Silent sound design
- Enhanced Intel SpeedStep® Technology supported
- Cold redundant feature

Expandability

- PCI Express 3.0 (x8 lanes): 1 slot (Full height) *5, 6
- PCI Express 3.0 (x8 lanes): 1 slot (Low profile) *6
- PCI Express 3.0 (x8 lanes): 1 slot (dedicated to RAID controller)
- LOM card slot (x8 lanes): 1 slot (dedicated to LOM card)
- Large capacity memory of up to 1 TB *3
- Can upgrade to multi-processor system with up to two processors
- Expansion Bay (for hard disk drives): 8 slots
- Optical disk drive bay provided as standard
- USB3.0 interface (Front: 2 ports, rear: 2 ports, internal: 1 port)
- USB2.0 interface (internal: 2 ports)
- Management LAN port (1 port)
- With optional LOM card, two to four ports can be added.

Ready to use

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

Many built-in Features

- Redundant power supply system supported (valid when optional power supply unit is installed)
- El Torito Bootable CD-ROM (no emulation mode) format supported
- Software power-off
- Remote power-on feature
- AC-Link feature
- Remote console feature
- Power switch mask
- Connector for display unit provided on front panel
- 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 (setup utility)
- BIOS Setup utility (SETUP)

Maintenance features

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

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

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

*3:   In 2-CPU configuration. Up to 512 GB in 1-CPU configuration.

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

*5:   Requires N8116-39 Riser Card (PCIe x8)

*6:   Can be changed to PCI Express 3.0: 1 slot (x16 lanes) by using optional riser card.

3.1   **Firmware and Software Version Management**

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

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

4. Names and Functions of Parts

This section describes the names of the server parts.

4.1 Front View (With Front Bezel)
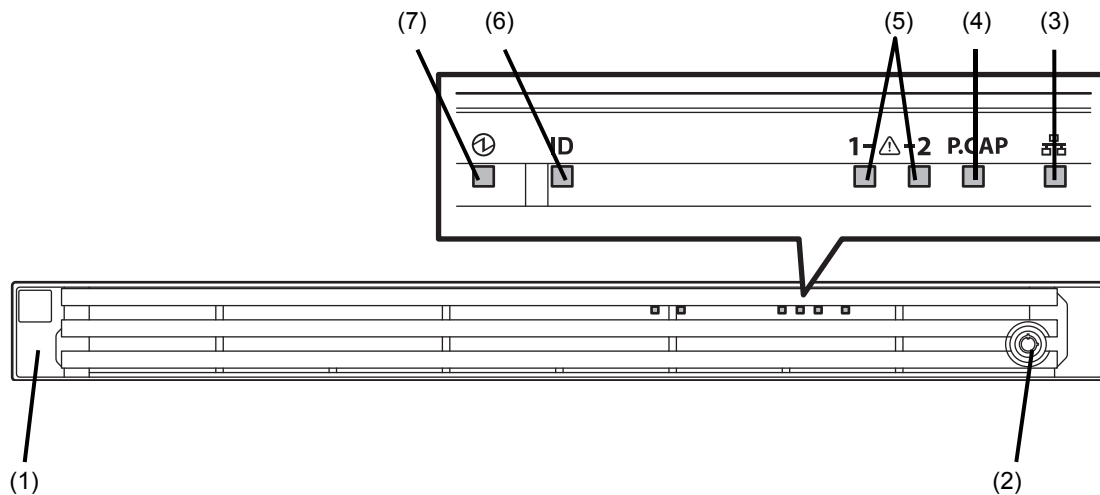
(1) Front Bezel
A cover to protect the front of the server. This cover can be locked with the provided Bezel Lock Key.

(2) Key Slot
A slot for Bezel Lock Key that is used to lock Front Bezel.

(3) LINK/ACT LED
LEDs for showing the status of accessing the network.
(See page 34)

(4) Power Capping LED
An LED for showing the power capping status of the server.
(See page 34)

(5) STATUS LED 1, 2
LEDs for showing the server status.
(See page 32)

(6) Unit ID (UID) LED
An LED for maintaining the server. This LED turns on when UID Switch is pressed. Commands from the software also cause it to turn on or flash.
(See page 34)

(7) POWER LED
An LED for showing the power status of server.
(See page 32)

4.2   Front View (Without Front Bezel)

See (3) to (5) on previous page.
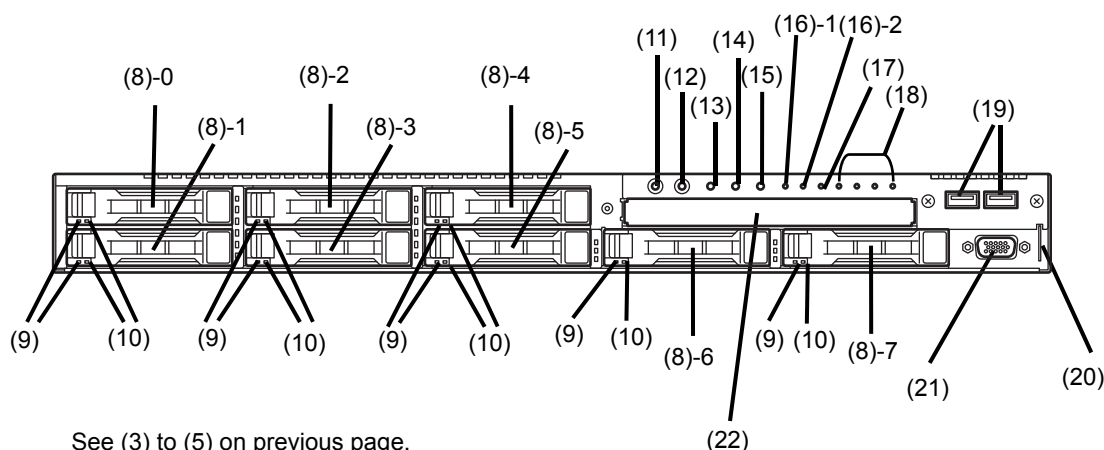
(8) 2.5-inch Hard Disk Drive Bay
Bays for installing HDDS. The sequential numbers indicate the corresponding slot numbers. All bays include Dummy Trays as standard.

(9) DISK Access LED
LEDs for showing the access of hard disk drives.
The LED is provided for each hard disk drive.
(See page 35)

(10) DISK STATUS LED
LEDs for showing the status of hard disk drive.
The LED is provided for each hard disk drive.
(See page 35)

(11) POWER Switch/LED
A switch for turning on/off the server. Press once to turn on the server. POWER LED lights when it is on. Press it again to turn off the server. Hold down the switch for four seconds or more to forcibly turn off the server.
(See page 32)

(12) Unit ID (UID) Switch/LED
A switch for turning on/off UID LED.
Pressing the switch once turns on UID LED and pressing again turns off the LED.
Commands from the software also cause it to turn on or flash.
(See page 34)

(13) RESET Switch
A switch for resetting the server.

(14) DUMP Switch (NMI)
A switch for collecting the memory dump.

(15) BMC RESET Switch
A switch for resetting BMC of this server. Use the switch only when there is a problem with EXPRESSSCOPE Engine 3 (BMC).
To use this switch, press it at least five seconds.

(16) STATUS LED 1, 2
LEDs for showing the server status.
(See page 32)

(17) Power Capping LED
An LED for showing the power capping status of the server.
(See page 34)

(18) LINK/ACT LED
LEDs for showing the access status of LAN.
(3)-1: LAN1 connector
(3)-2: LAN2 connector
(3)-3: LAN3 connector
(3)-4: LAN4 connector
LEDs for LAN3 and LAN4 are lit when optional LOM card (N8104-154/156) is installed.

(19) USB Connectors (front)
Connectors for connecting USB interface devices.

(20) Pull-out Tab
A tab for showing the part number and serial number of the server.

(21) Display Connector
A connector for connecting a display. This connector cannot be used with the display connector on rear panel at the same time.

(22) 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

4.3   Rear View
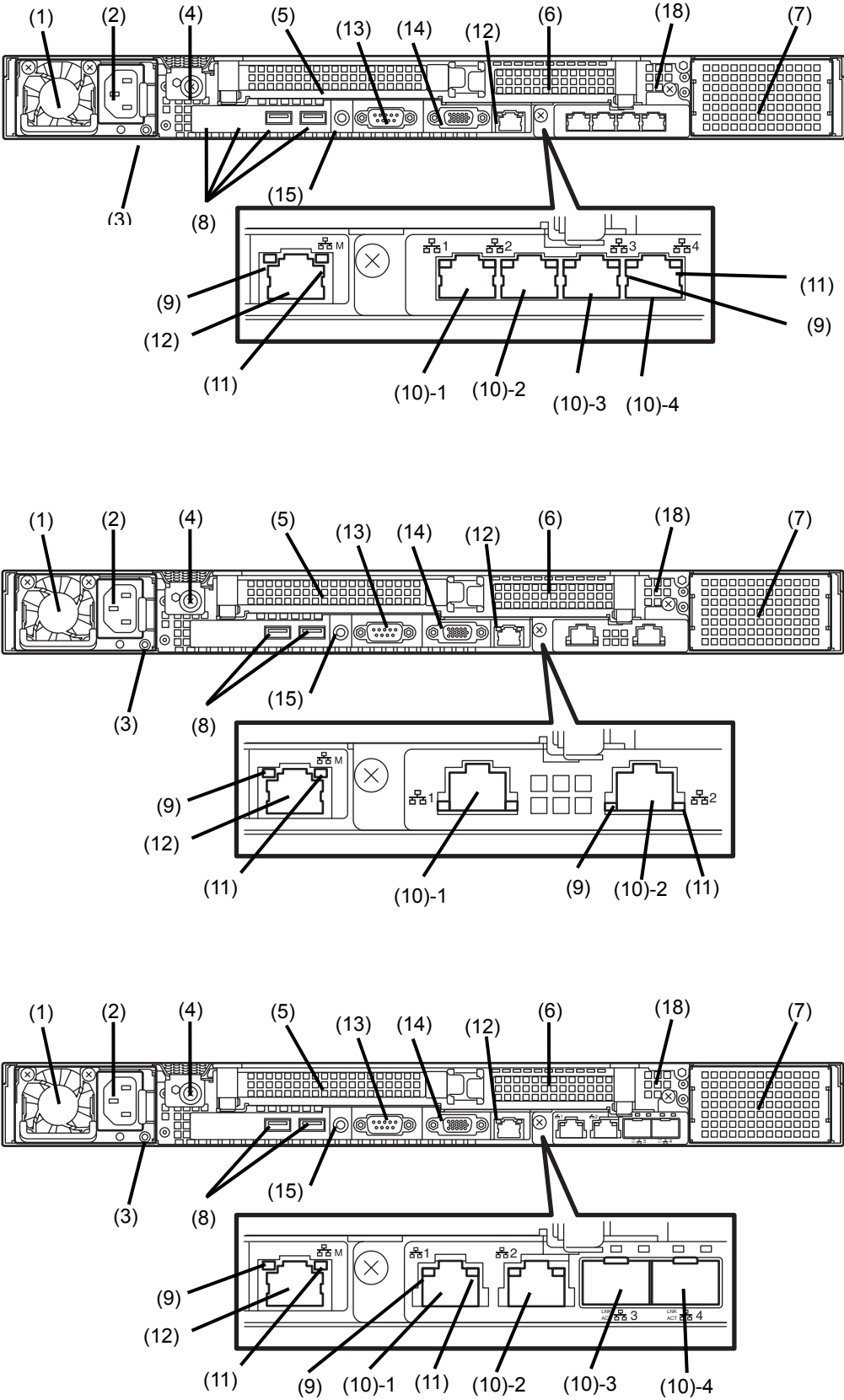
(1) Power Unit (Power supply slot 1)

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

(2) AC Inlet

A socket for connecting the power cord.

(3) AC POWER LED

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

(4) Cap Screw

A screw for fixing the top cover.

(5) Slot for Full-height PCI Card

A slot for installing a full-height PCI card.
Assigned PCI slot number is "1C".

(6) Slot for Low-profile PCI Card

A slot for installing a low-profile PCI card.
Assigned PCI slot number is "1D".

(7) Blank Cover (for power unit #2)

A cover for protecting the bay of additional power supply.

(8) USB Connectors

Connectors for connecting USB interface devices.

(9) LINK/ACT LED *1

LEDs for showing the access status of LAN.
(See page 36)

(10) LAN Connectors *1

LAN connectors which supports
1000BASE-T/100BASE-TX/10BASE-T.
(10)-1: LAN1 port connector
(10)-2: LAN2 port connector
(10)-3: LAN3 port connector
(10)-4: LAN4 port connector

If Shared BMC LAN feature is enabled in ROM Utility,
LAN1 connector can also be used as the management
LAN port. Sharing port is not recommended from the point
of performance and security.

(11) SPEED LED *1

LEDs for showing the transfer speed of LAN ports.
(See page 36)

(12) Management LAN Connector

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

(13) Serial Port A (COM) Connector

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

(14) Display Connector

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

(15) UID Switch/LED

A switch for turning on/off UID LED.
Pressing the switch once turns on UID LED and pressing
again turns off the LED.
Commands from the software also cause it to turn on or
flash.
(See page 34)

*1   LOM card is optional. The figure above shows when
N8104-154 is installed.

4.4 External View
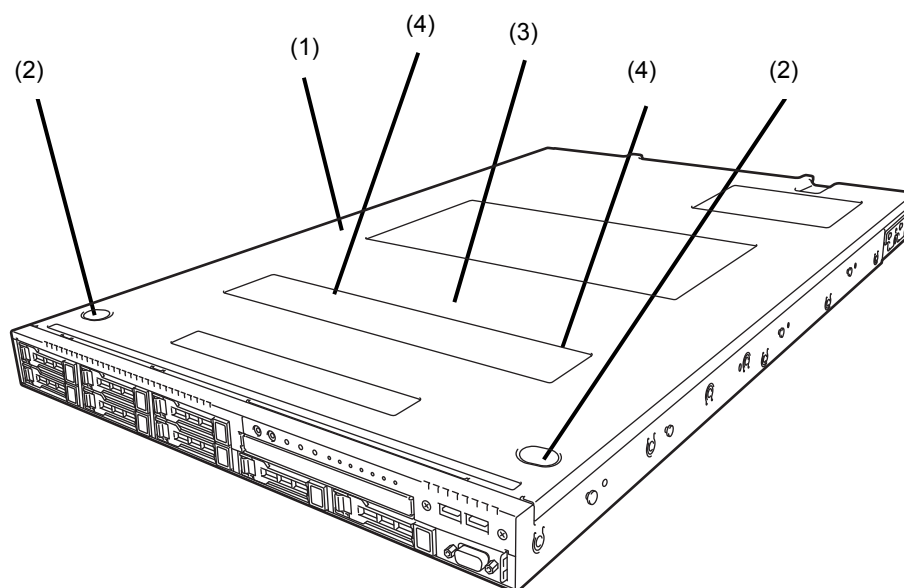
(1)   Top Cover

(2)   Release Button.

(3)   Fan Unit Top Cover

(4)   Latch for fixing Fan Unit Top Cover

4.5 Internal View
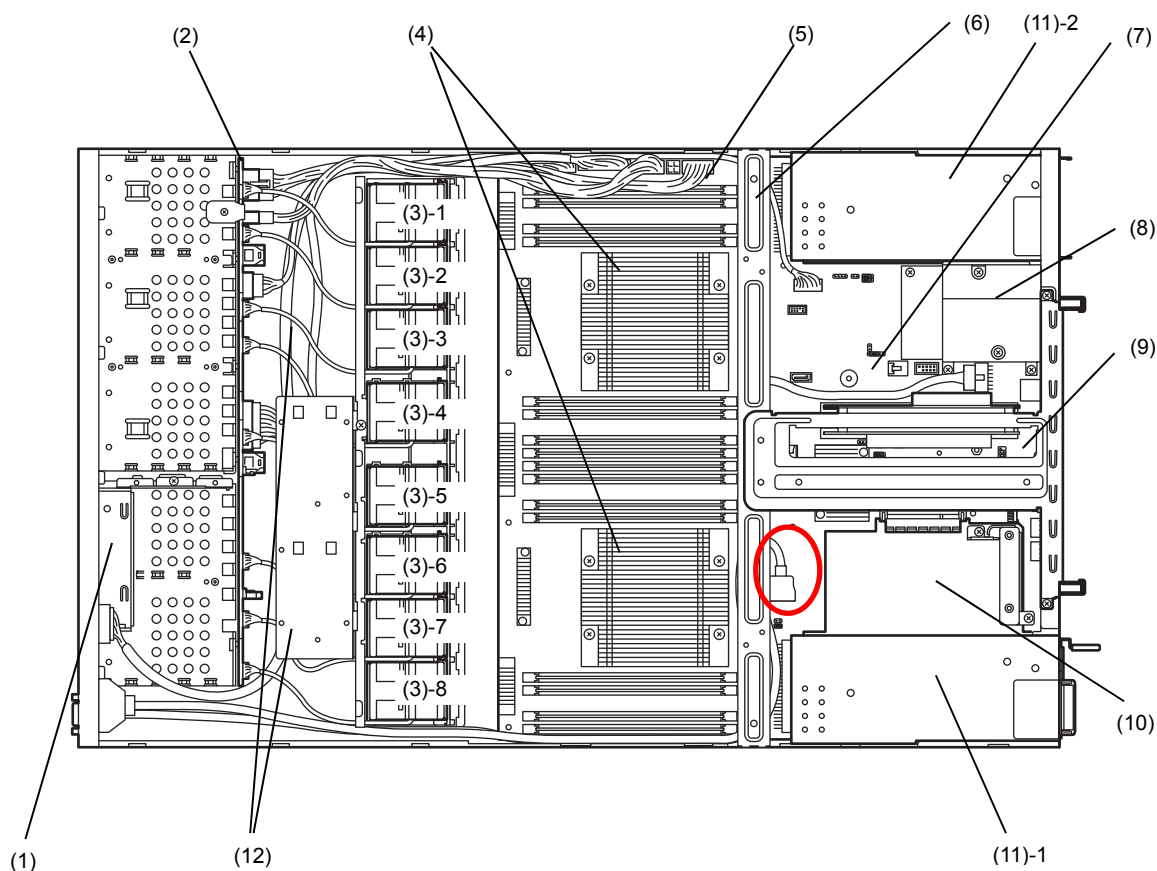
(1) Front Panel Board

(2) Backplane

(3) Cooling Fan
- -1 FAN1F/R
- -2 FAN2F/R
- -3 FAN3F/R
- -4 FAN4F/R
- -5 FAN5F/R
- -6 FAN6F/R (optional)
- -7 FAN7F/R (optional)
- -8 FAN8F/R (optional)

FAN1 to FAN5 are factory installed. FAN6 to FAN8 are required in 2-CPU configuration.

(4) Processor (Optional)
(mounted below the heat sink)

(5) DIMM (optional)

(6) Support Bar

(7) Motherboard

(8) Slot for LOM Card
Assigned PCI slot number is "1B".

(9) PCI Riser Card

(10) Slot for RAID Controller
Assigned PCI slot number is "1A".

(11) Power Supply Unit

(12) Battery Tray for RAID Controller

4.6 Motherboard
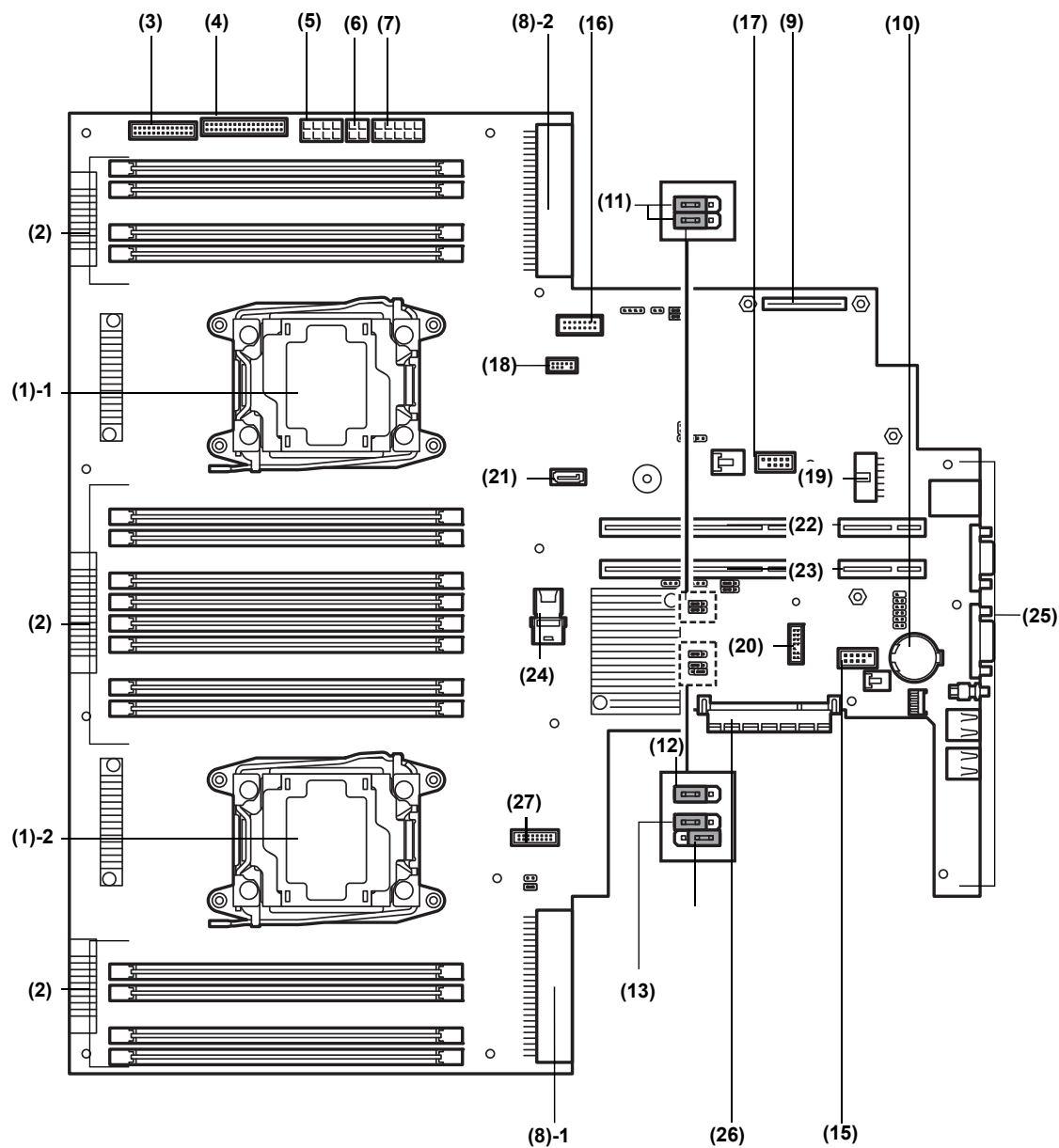
(1) Processor (CPU) Socket
-1: Processor #1 (CPU #1)
-2: Processor #2 (CPU #2)

(2) DIMM Socket

(3) Front Panel Connector

(4) Fan Connector

(5) Power Connector for Fan Unit

(6) Power Connector for SATA Optical Disk Drive

(7) Power Connector for HDD BP

(8) Power Connector
-1: Standard power unit (POW #1)
-2: Optional power unit (POW #2)

(9) LOM Card Connector

(10) Lithium Battery

(11) Unused Connector

(12) Clear Password Jumper Switch

(13) Clear CMOS Jumper Switch

(14) SW-RAID Jumper Switch

(15) USB Memory Module Connector

(16) Front Video Connector

(17) Connector for Optional COM
Connect an additional RS-232C connector kit N8117-01A
to use this port as a serial port.

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

(19) Unused Connector

(20) TPM Kit Connector

(21) SATA Connector (for optical disk drive)

(22) PCI Riser Card Connector (for low profile card)
For the supported card specifications, see *Chapter 2 (1.11
PCI card)*.

(23) PCI Riser Card Connector (for full height card)
For the supported card specifications, see *Chapter 2 (1.11
PCI card)*.

(24) SATA HDD Connector

(25) Connectors for External Devices (See page 26)

(26) RAID Controller Connector

(27) USB Connector (front)

4.7   Status Indicators

4.7.1   POWER LED (①)

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

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

4.7.2   STATUS LED 1, 2 (⚠)

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

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

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

STATUS LED 1, 2 pattern		Description	Solution
STATUS LED 1	**STATUS** LED 2		
On (green)	Off	The server is operating normally.	−
On (green)	On (amber)	Initialization of BMC is in progress.	Wait until initialization completes. (LED goes off). If the LED indication does not change after a few minutes, contact your sales representative.
Blinking (green)	Off	Memory is in a degraded state	Check the power supply path, e.g., power cable, etc. Contact your sales representative when there is no problem.
		Operating while CPU error is detected.	
		In redundant power configuration, power is not supplied to either of power unit.	
Off	Off	The power is off.	Turn the power ON when it is turned OFF. Wait until the POST is completed if it is in progress. Wait until the memory dump is completed when the DUMP switch is pressed. Contact your sales representative when there is no problem.
		POST is in progress.	
		Memory dump is being requested. (In such a case when the DUMP switch is pressed) Note: It remains green if the dump is caused by software.	
		CPU could not be recognized.	
		Watchdog timer expired.	
		An uncorrectable error is detected in the memory.	
		PCI system error has been detected.	
		PCI parity error has been detected.	
		PCI bus error has been detected.	

STATUS LED 1, 2 pattern		Description	Solution
STATUS LED 1	STATUS LED 2		
Off	Blinking (amber)	Power Supply Unit is failing (in power redundant configuration).	Remove dusts and contaminations form the intake duct and fan when they are contaminated. If the LED indication does not change, Contact your sales representative.
		A fan warning was detected.	
		A temperature warning was detected.	
		Voltage warning was detected.	
		One or more hard disk drives are failing (excluding RAID0 or non-RAID configuration).	
		Log acquisition stop: Memory correctable errors often occur.	
Off	On (amber)	Power supply error was detected.	
		Temperature error was detected.	
		Voltage error was detected.	
		CPU error was detected.	
		Chipset error was detected.	
		An uncorrectable error was detected in the memory.	
		SMI Timeout was detected.	
		Sensor failure was detected.	

4.7.3   LINK/ACT LED (⊞1, ⊞2, ⊞3, ⊞4)

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

The number of LEDs depends on an optional LOM card installed.

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

4.7.4   Optical Disk Drive Access LED

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

4.7.5   UID LED (ID)

UID LED is provided one each at the front and rear of the server. If you press UID Switch provided at the front or rear of the server, the light turns on. If you press it again, the light turns off. It flashes when commands from software are received.

This LED is used to identify the target server among multiple servers installed in a rack. Especially when performing maintenance from behind the server, lighting the LED will help you to identify which server to work with.

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

4.7.6   Power Capping LED

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

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

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

4.7.7   LED on a hard disk drive

Each HDD is equipped with DISK LED.

DISK LED 2 (amber)

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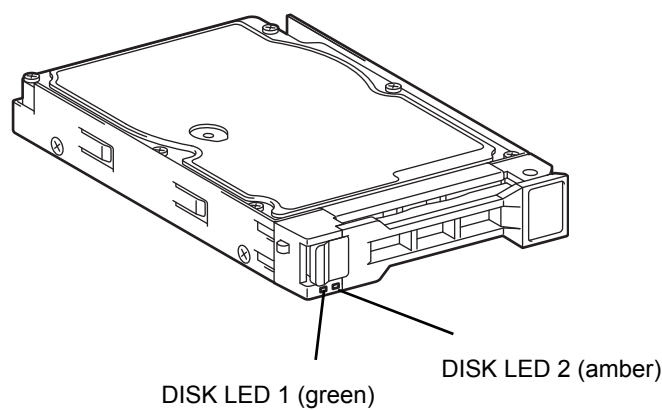
DISK LED 1, 2 pattern		Description	Solution
DISK LED 1	DISK LED 2		
Flashing (green)	Off	Hard disk drive is being accessed.	–
Off	On (amber) (only when RAID system is configured)	Hard disk drive is failing.	Contact your sales representative.
Flashing (green)	Flashing (amber) (only when RAID system is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

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

4.7.8   **LEDs for LAN connectors**

The LAN connectors have LINK/ACT LED and SPEED LED.

● Equipped with N8100-154

LINK/ACT LED
SPEED LED
SPEED LED

Management LAN connector

LAN connector

LINK/ACT LED

● Equipped with N8100-155

LINK/ACT LED
SPEED LED
LINK/ACT LED
SPEED LED

Management LAN connector

LAN connector
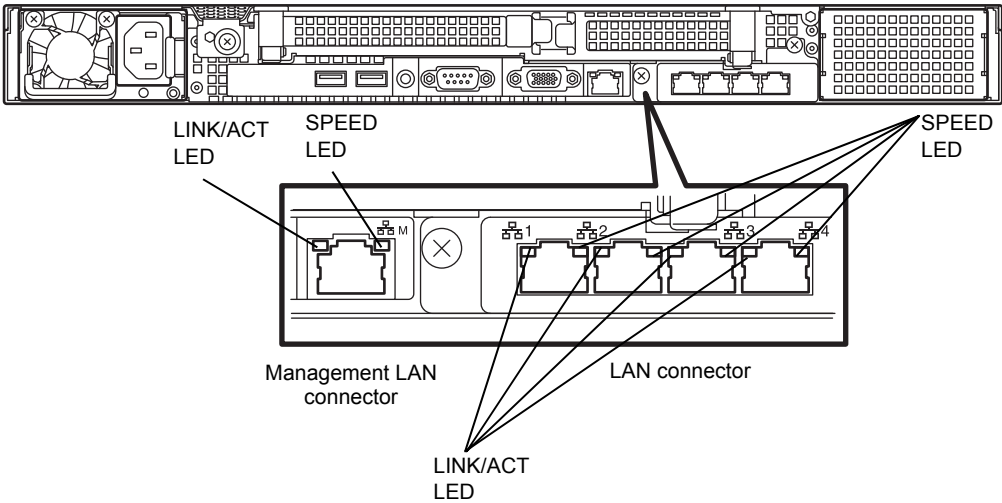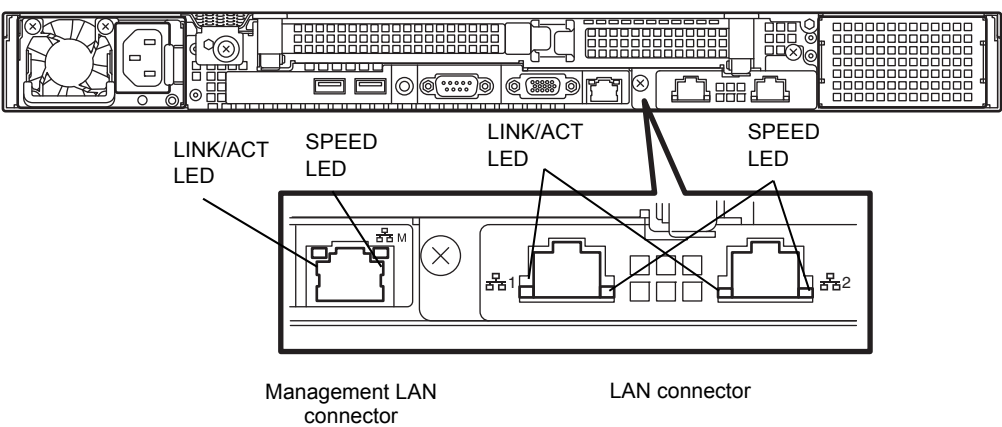
● Equipped with N8100-156

LINK/ACT LED
SPEED LED
LINK/ACT LED

Management LAN connector

SPEED LED

LAN connector
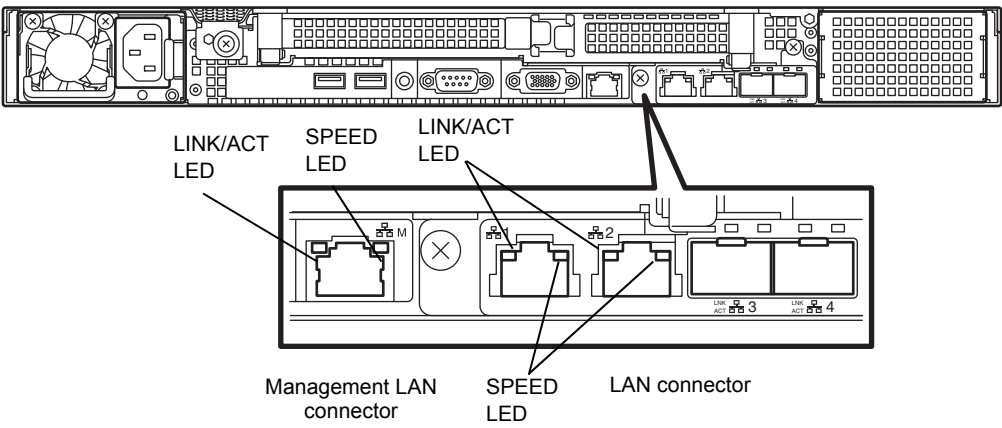
- **LINK/ACT LED (⬛1, ⬛2, ⬛3, ⬛4, ⬛M)**

    This LED indicates the status of the LAN port.

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

- **SPEED LED (⬛1, ⬛2, ⬛3, ⬛4, ⬛M)**

    This LED indicates which network interface is used.

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.

    When N8100-154 1000BASE-T LOM card (4ch) is installed

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.

    When N8104-155 10GBASE-T LOM card (2ch) is installed

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

    When N8104-156 10GBASE-SFP+ (2ch) + 1000BASE-T (2ch) LOM card is installed

    – When operating with 10GBASE-SFP+

SPEED LED pattern	Description
On (green)	The port is operating with 10GBASE-SFP+ interface.
On (amber)	The port is operating with 1000BASE-SFP+ interface.
Off	The port is not operating.

    – When operating with 1000BASE-T

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

4.7.9   AC POWER LED on power unit

The power unit is equipped with AC POWER LED.
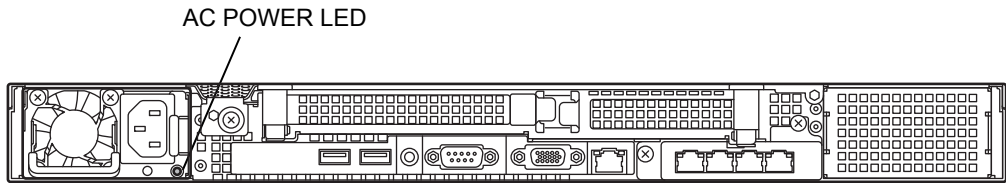
AC POWER LED

AC POWER LED pattern	Description	Solution
On (green)	The server is powered on.	–
Flashing (green)	The power cable is connected and AC power is supplied.	–
	Cold Redundant feature is enabled. (See page 95)	–
On (amber)	The power cable is not connected in redundant power configuration.	Connect the power cable.
	Power unit is failing.	Contact your sales representative.
Flashing (amber)	Power unit is failing.	Contact your sales representative.
Off	The power is not supplied to the server.	Connect the power cable. If it is already connected, contact your sales representative.

2

NEC Express5800 Series
Express5800/R120g-1E

Preparations

This chapter describes preparations for using this server.

1. **Installing Internal Options**

   Describes how to install or remove optional devices.

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

2. **Installation and Connection**

   Describes how to place the server and connect the cables.

1. Installing Internal Options

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

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

1.1   Safety Precautions

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

⚠ WARNING

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

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

⚠ CAUTION

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

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

1.2   Overview of Installation and Removal

Install/remove components by using the following procedure.

⚠ **CAUTION**

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

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

1. If the server is mounted on a rack, use UID Switch to identify the target server.
    See *Chapter 2 (1.3 Identifying Server (UID Switch))*.

2. Remove Front Bezel.
    See *Chapter 2 (1.4 Removing Front Bezel)*.
    If you want to install hard disk drives only, go to step 10.

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 30 seconds before continuing to work because cooling fan, hard disk drive, and other components are operating for a few seconds.**
> - **Make sure AC POWER LED on power supply unit is unlit.**

5. Pull out the server from rack and put it on a flat rigid desk. See *Chapter 2 (2.1 Installation)* for details.

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

6. Remove Top Cover.
    See *Chapter 2 (1.5 Removing 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 (*1.13 Use of Internal Hard Disk Drives in the RAID System*).

8. Attach Top Cover.
    See *Chapter 2 (1.14 Installing Top Cover)*.

9. Mount the server onto the rack.
    See *Chapter 2 (2.1.2 (1) Installation)*.

10. Install hard disk drives
    See *Chapter 2 (1.15 Hard Disk Drive)*.

11. Install power supply units
     See *Chapter 2 (1.16 Power Supply Unit)*.

12. Attach Front Bezel.
     See *Chapter 2 (1.17 Installing Front Bezel)*.

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

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

1.3   **Identifying Server (UID Switch)**

Using Unit ID (UID) Switch helps you to identify the target server from several servers in one rack.

When servers are running on a rack, before you turn the server off or disconnect a cable from the server, **be sure to identify the target server by using UID Switch first.**

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

UID Switch / LED

FRONT

REAR

UID Switch / LED
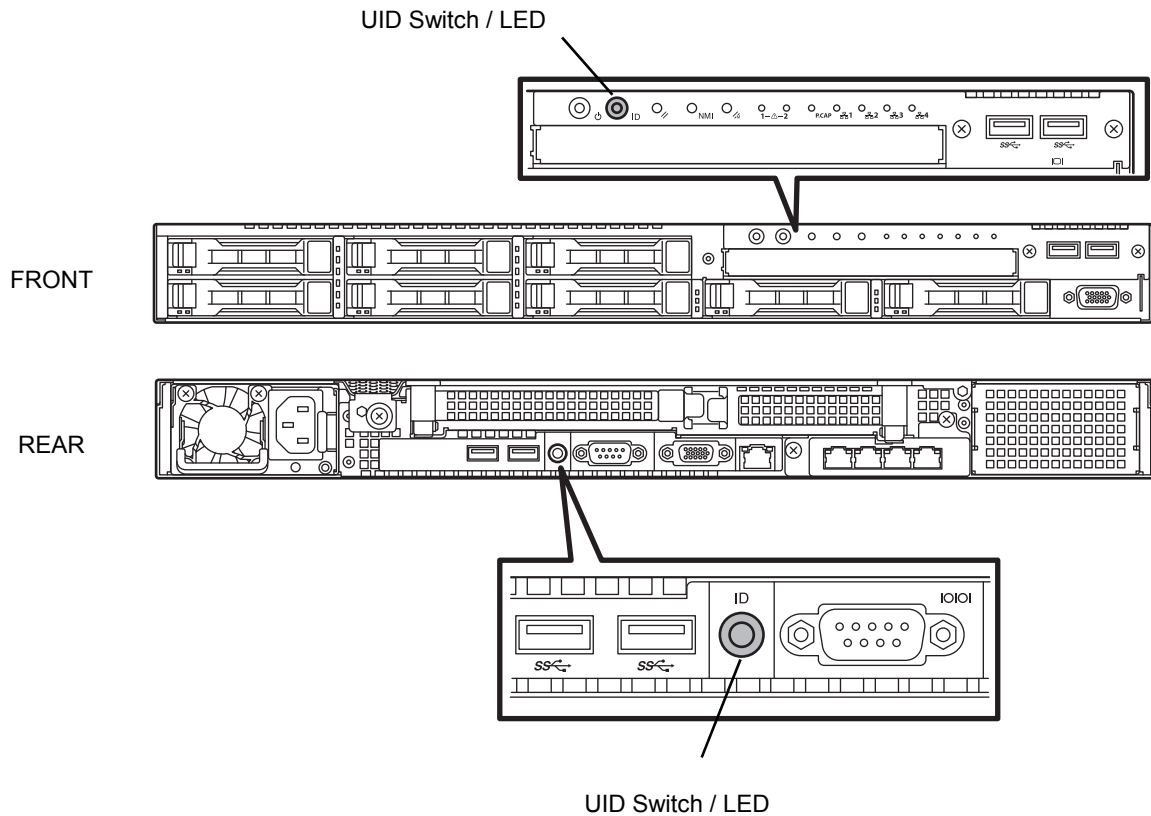
1.4   **Removing Front Bezel**

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

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

Unlocked   Locked
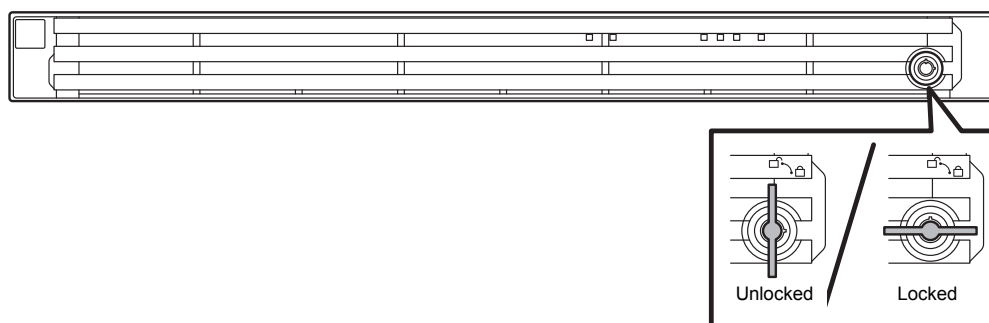
2. Hold the right end of Front Bezel and pull it toward you, and remove the right end from the chassis.

3. Hold the left end of Front Bezel and pull it toward you, and remove the left end from the chassis.
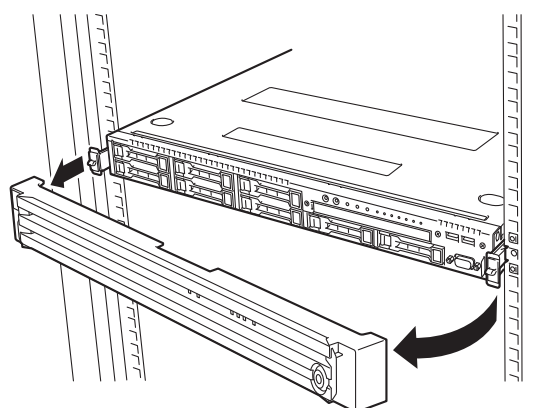
Note	Be careful not to press POWER Switch.

1.5   Removing Top Cover

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

1. See steps 1 to 5 in *Chapter 2* (*1.2 Overview of Installation and Removal)* for preparations.

2. Loosen Cap Screw located on rear panel.

3. Slide Top Cover toward the rear of the server while pressing Release Button on the cover.

4. Lift the cover, and remove it from the server.
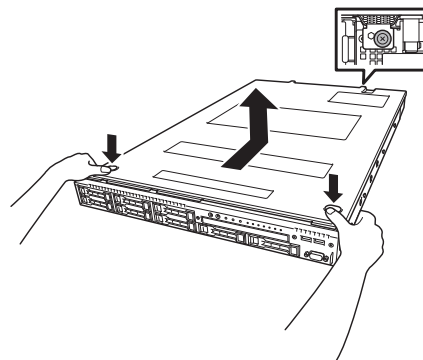
1.6   **TPM Kit**

This section describes the procedure for installing optional TPM Kit.

Connector for TPM Kit
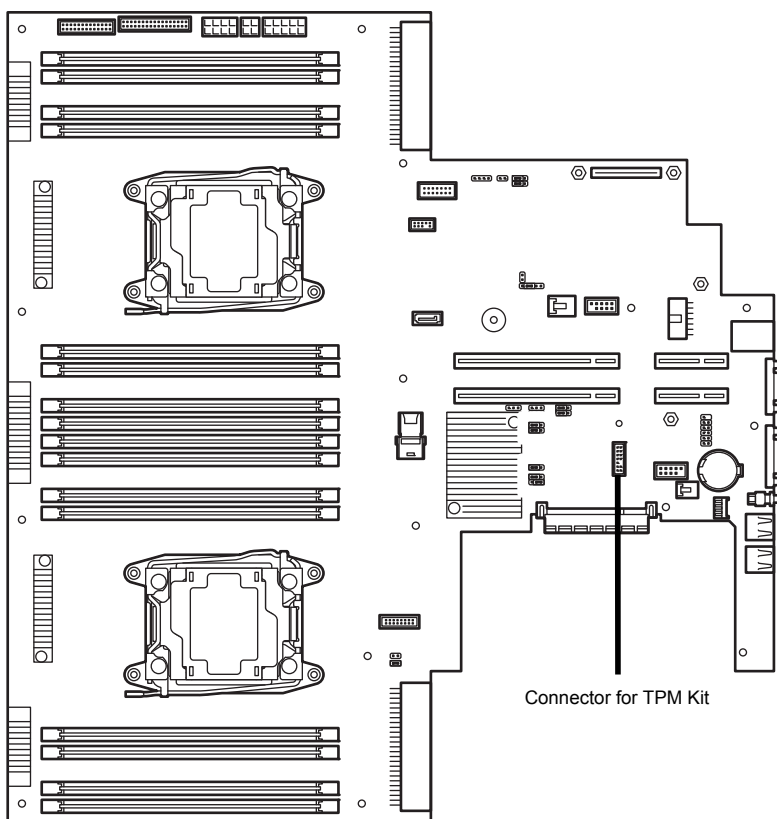
1.6.1   **Installation**

Install TPM Kit in the following procedure.

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

2.   Install TPM Kit and secure it by pushing the nylon rivet attached to TPM Kit.
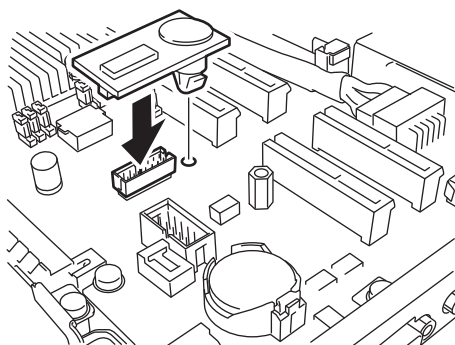
Important	**TPM Kit once installed cannot be removed.**
	Ask your sales representative if you want to remove the TPM Kit.

1.7   Processor (CPU)

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

Important	• **Avoid static electricity to work with the procedure below. For details, see** *Chapter 1 (1.8 Anti-static Measures) in Safety Precautions and Regulatory Notices.* • **Installing a third-party CPU may cause a failure. Repair of the server due to failures or damage resulted from installing such a CPU will be charged.**

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

1.7.1   Maximum number of processor cores supported by this server

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

Maximum number of processor cores

OS	The maximum number of logical processors supported by OS	The maximum number of logical processors supported by this server
Microsoft Windows Server 2008 R2 Standard (x64) Microsoft Windows Server 2008 R2 Enterprise (x64)	256 *1	88
Microsoft Windows Server 2012 Standard Microsoft Windows Server 2012 Datacenter Microsoft Windows Server 2012 R2 Standard Microsoft Windows Server 2012 R2 Datacenter	640 *1	88
VMware ESXi 5.5	320	88
VMware ESXi 6.0	480	88

*1:   When Hyper-V is used, the maximum number of logical processors is as shown below:
      Windows Server 2008 R2: 64
      Windows Server 2012, Windows Server 2012 R2: 320

1.7.2   Installation

Follow the steps below to install the CPU.

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

2. Locate the CPU socket to which you are going to install a CPU.
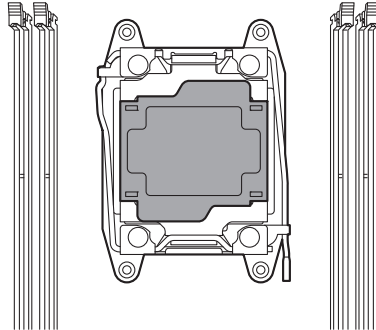
3. Remove the protective cover from the CPU socket.
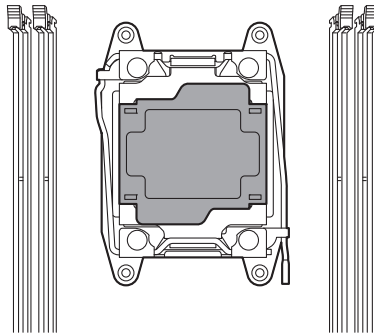
Note	Keep the removed protective cover for future use.

4. Push down the socket lever marked with "⌐ ① →" once to unlatch it from the hook, then slowly open the lever until it stops.
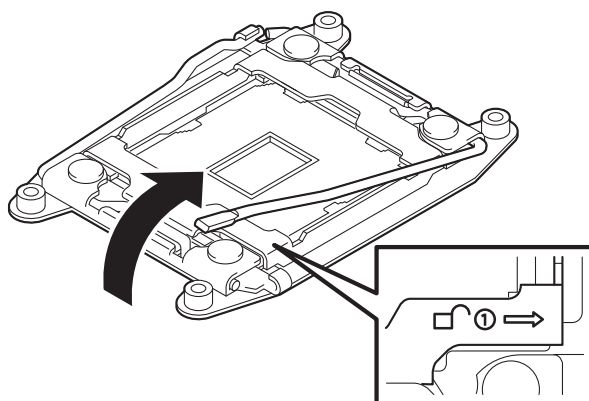
5. Push down the socket lever marked with "← ⌐ ①" once to unlatch it from the hook, then slowly open the lever until it stops.
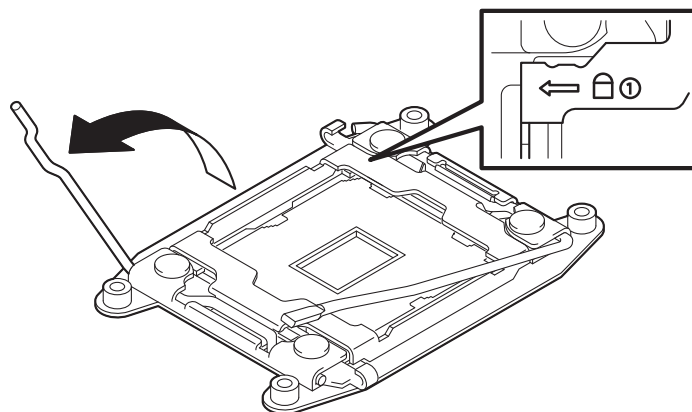
6. Lift the plate.
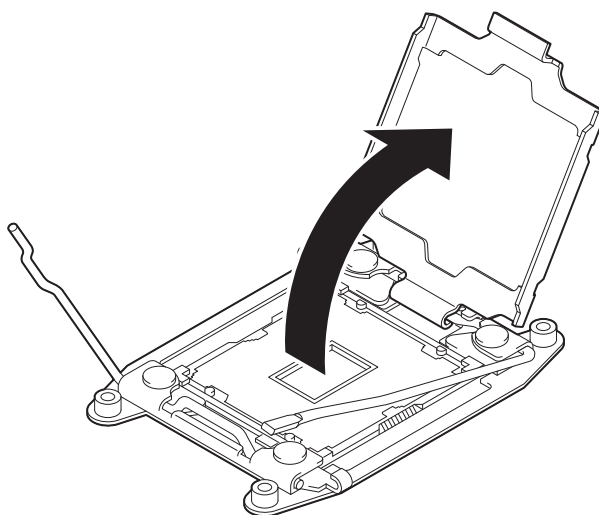
| Important | **Do not touch the socket contacts.** |

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

For easy installation, hold edges of CPU with your thumb and index fingers so that the notch is aligned with the key on the CPU socket.
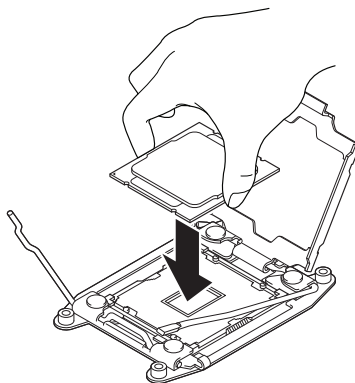
Important	• **Be sure to hold the CPU only at the edges.** • **Pay attention not to touch the bottom of the CPU (pin section).**

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

8. Lightly push the CPU to the CPU socket, and close the plate.
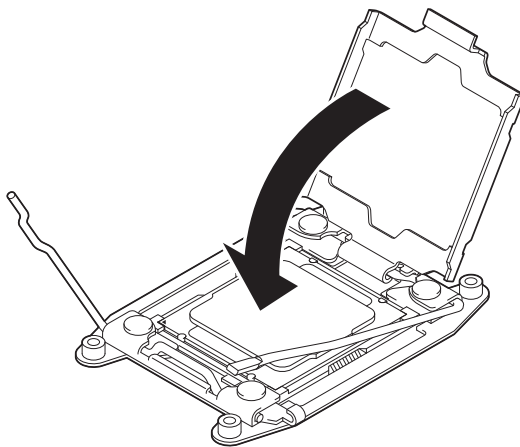
9. Close the socket lever marked with "← 🔒 ① " to fix it.
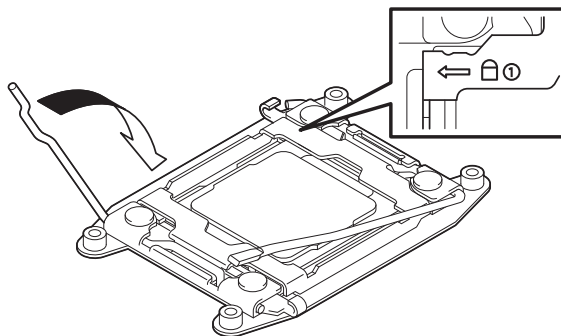
10. Close the socket lever marked with " ⌐⌐ ① →" to fix it.
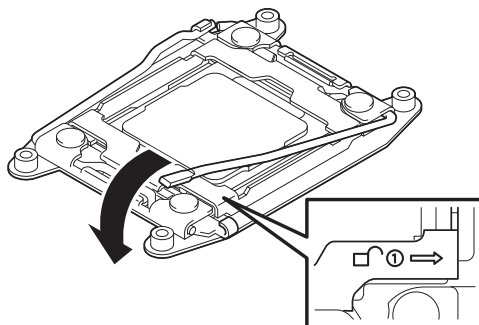
11. Put the heat sink on the CPU and fix the heat sink with four screws.

Temporarily tighten the four screws diagonally, then tighten them securely.

Make sure that the screw aligns with the screw hole. If not, the screw may damage the motherboard.
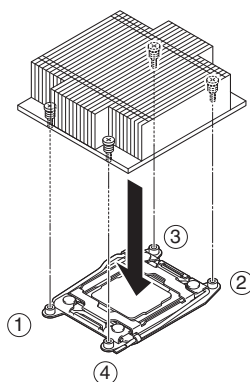
12. Make sure that the heat sink is installed on a level with the motherboard.

REAR

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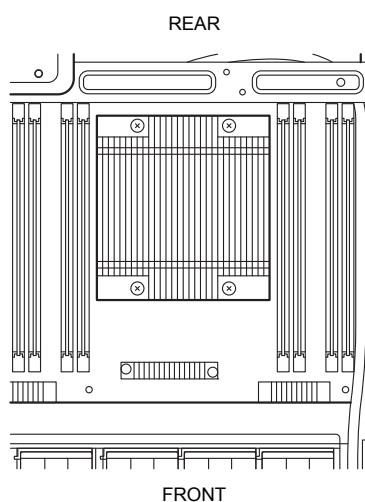
| Note | • If the heat sink is not level, remove it, and then install it again.
The following probably causes the heat sink not to be level:
– The CPU is not positioned correctly.
– All screws are not completely tightened.
• Do not move the secured heat sink. |

13. Install an additional fan unit provided with additional CPU board.
    Remove fan cover from the slot where you are going to install an additional fan unit.
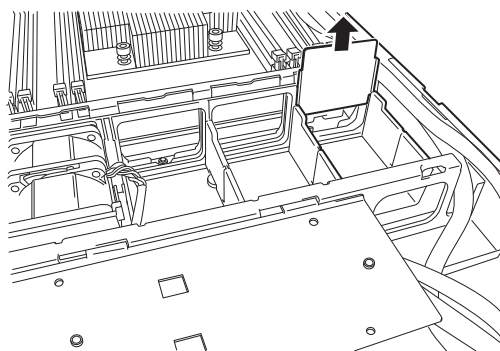
14. Remove the tray for RAID Controller.
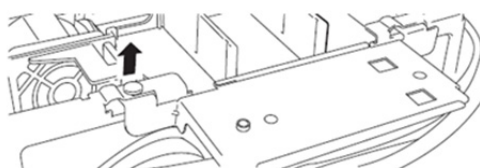
15. Insert the additional fan unit straight into fan cage.
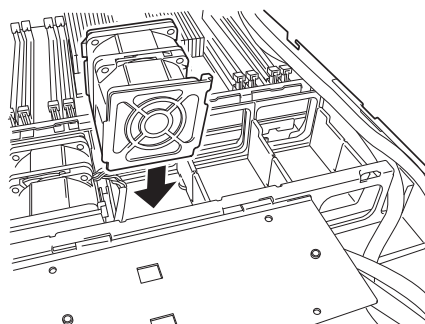
16. Connect cables for additional fan unit to the backplane.
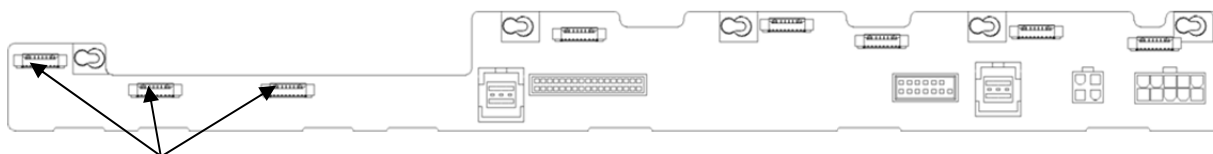
17. Insert the tray for RAID Controller.
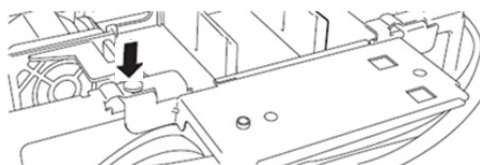
18. Continue to install or remove internal options, mount and connect the server, and turn it on.

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

> **Advanced → Processor Configuration → Processor Information**

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

1.7.3   **Replacement / Removal**

Important	• **Do not remove any CPU unless it is failed.**
	• **To remove the heat sink from the CPU, first turn the heat sink to the left and right lightly to make sure that the heat sink can be apart from the CPU. Removing the heat sink with it adhering to the CPU may cause the CPU and/or CPU socket to be defected.**

To remove CPU, reverse the installation procedure.

Perform the following steps if CPU is removed.

1. Mount the protective cover to CPU socket.

2. Remove the additional fan unit.

3. Mount the fan cover.

1.8   DIMM

Install a Dual Inline Memory Module (DIMM) to a DIMM socket on the motherboard in the server.

The motherboard provides 16 sockets to install DIMMs.

Important	• **Avoid static electricity to work with the procedure below. For details, see** *Chapter 1 (1.8 Anti-static Measures) in Safety Precautions and Regulatory Notices.* • **Use only the specified DIMMs. Installing a DIMM from a third party may damage not only the DIMM but the motherboard. You will be charged to repair failures or damages caused by the use of such products even within the warranty period.**
Tips	Up to 1 TB (64 GB x 16) can be installed in 2-CPU configuration. Up to 512 GB (64 GB x8) can be installed in 1-CPU configuration. No DIMMs are factory installed in standard configuration.

1.8.1   Maximum supported memory size

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

Maximum memory sizes

OS	Maximum memory size supported on each OS	Maximum memory size supported on the server
Microsoft Windows Server 2008 R2 Standard *1	32GB	32GB
Microsoft Windows Server 2008 R2 Enterprise *1	2TB	1TB
Microsoft Windows Server 2012 Standard *1 Microsoft Windows Server 2012 Datacenter *1 Microsoft Windows Server 2012 R2 Standard *1 Microsoft Windows Server 2012 R2 Datacenter *1	4TB	1TB
VMware ESXi 5.5 *2	4TB	1TB
VMware ESXi 6.0 *3	6TB	1TB

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

  - Windows Server 2008 R2 Standard : 32GB

  - Windows Server 2008 R2 Enterprise : 1TB

  - Windows Server 2012 ,Windows Server 2012 R2: 4TB

*2: Up to 1 TB on virtual machine.

*3: Available memory capacity for virtual machine is 4 TB at the maximum.

1.8.2   Memory Clock

The server supports the memory clock speed of DDR4-1600/1866/2133 MHz but the actual memory clock speed depends on CPU and memory configuration. The all of DIMMs operate at the same clock speed.

Code Number (CPU)	DIMM type	Clock speed
N8101-1029F (E5-2603v4) N8101-1030F (E5-2620v4)	4GB DDR4-2400 REG Memory Kit (1x4GB)	1866MHz
	8GB DDR4-2400 REG Memory Kit (1x8GB)	
	16GB DDR4-2400 REG Memory Kit (1x16GB)	
	32GB DDR4-2400 REG Memory Kit (1x32GB)	
	64GB DDR4-2400 TSV REG Memory Kit (1x64GB)	
	16GB DDR4-2400 REG Memory Kit (2x8GB)	
	32GB DDR4-2400 REG Memory Kit (2x16GB)	
	16GB DDR4-2400 REG Memory Kit (2x8GB)	
	32GB DDR4-2400 REG Memory Kit (2x16GB)	
N8101-1031F (E5-2623v4) N8101-1032F (E5-2630v4) N8101-1036F (E5-2650v4)	4GB DDR4-2400 REG Memory Kit (1x4GB)	2133MHz
	8GB DDR4-2400 REG Memory Kit (1x8GB)	
	16GB DDR4-2400 REG Memory Kit (1x16GB)	
	32GB DDR4-2400 REG Memory Kit (1x32GB)	
	64GB DDR4-2400 TSV REG Memory Kit (1x64GB)	
	16GB DDR4-2400 REG Memory Kit (2x8GB)	
	32GB DDR4-2400 REG Memory Kit (2x16GB)	
	16GB DDR4-2400 REG Memory Kit (2x8GB)	
	32GB DDR4-2400 REG Memory Kit (2x16GB)	
N8101-1037F (E5-2650Lv4) N8101-1045F (E5-2609v4) N8101-1046F (E5-2660v4)	4GB DDR4-2400 REG Memory Kit (1x4GB)	2400MHz
	8GB DDR4-2400 REG Memory Kit (1x8GB)	
	16GB DDR4-2400 REG Memory Kit (1x16GB)	
	32GB DDR4-2400 REG Memory Kit (1x32GB)	
	64GB DDR4-2400 TSV REG Memory Kit (1x64GB)	
	16GB DDR4-2400 REG Memory Kit (2x8GB)	
	32GB DDR4-2400 REG Memory Kit (2x16GB)	
	16GB DDR4-2400 REG Memory Kit (2x8GB)	
	32GB DDR4-2400 REG Memory Kit (2x16GB)	

1.8.3   Memory RAS Feature

The server supports the following RAS features. Some restrictions (such as DIMM installation location) are imposed on using the Memory Mirroring or Memory LockStep feature. See *Chapter 2 (1.8.8 Using Memory RAS Feature)* for conditions appropriate to your requirements.

- Standard memory feature (x4 SDDC ECC memory) *1
- Memory Mirroring feature (restrictions imposed on DIMM configuration)
- Memory LockStep feature (x8 SDDC ECC memory) (restrictions imposed on DIMM configuration)
- Memory Sparing feature (restrictions imposed on DIMM configuration)
  *1: x4 SDDC is not supported on N8102-631F

Supported RAS features depend on additional memory board.
See the table below for RAS features supported by additional memory board.

Features supported by additional memory board

Code Number and Product Name	Standard Feature (x4 SDDC)	Memory Mirroring Feature	Memory LockStep Feature (x8 SDDC)	Memory Sparing Feature
N8102-675F 4GB DDR4-2400 REG Memory Kit (1x4GB)	○	N/A	N/A	N/A
N8102-676F 8GB DDR4-2400 REG Memory Kit (1x8GB)	○	N/A	N/A	N/A
N8102-677F 16GB DDR4-2400 REG Memory Kit (1x16GB)	○	N/A	N/A	N/A
N8102-678F 32GB DDR4-2400 REG Memory Kit (1x32GB)	○	N/A	N/A	N/A
N8102-679F 64GB DDR4-2400 TSV REG Memory Kit (1x64GB)	○	N/A	N/A	N/A
N8102-680 16GB DDR4-2400 REG Memory Kit (2x8GB)	N/A	○	○	N/A
N8102-681 32GB DDR4-2400 REG Memory Kit (2x16GB)	N/A	○	○	N/A
N8102-683 16GB DDR4-2400 REG Memory Kit (2x8GB)	N/A	N/A	N/A	○
N8102-684 32GB DDR4-2400 REG Memory Kit (2x16GB)	N/A	N/A	N/A	○

○: Supported

1.8.4   DIMM installation order

Note	DIMM installation order in 1-CPU configuration differs from that in 2-CPU configuration.

In 1-CPU configuration, install two DIMMs starting from the smallest slot number. If CPU2 is not installed, CPU2_DIMM1 to CPU2_DIMM12 are disabled.

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

See the table below to find allowable combination of DIMMs. Any other combination of DIMMs than described in this table is not allowed.

Code Number	N8102-								
	675F	676F	677F	678F	679F	680	681	683	684
N8102-675F	○	○	○	○	N/A	N/A	N/A	N/A	N/A
N8102-676F	○	○	○	○	N/A	N/A	N/A	N/A	N/A
N8102-677F	○	○	○	○	N/A	N/A	N/A	N/A	N/A
N8102-678F	○	○	○	○	N/A	N/A	N/A	N/A	N/A
N8102-679F	N/A	N/A	N/A	N/A	○	N/A	N/A	N/A	N/A
N8102-680	N/A	N/A	N/A	N/A	N/A	○	○	N/A	N/A
N8102-681	N/A	N/A	N/A	N/A	N/A	○	○	N/A	N/A
N8102-683	N/A	N/A	N/A	N/A	N/A	N/A	N/A	○	N/A
N8102-684	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	○

○: Allowed to be installed together

1CPU configuration	2CPU configuration		
3	5	CPU1_DIMM 3	
7	13	CPU1_DIMM 7	
4	7	CPU1_DIMM 4	
8	15	CPU1_DIMM 8	
6	11	CPU1_DIMM 6	
2	3	CPU1_DIMM 2	
5	9	CPU1_DIMM 5	
1	1	CPU1_DIMM 1	
	6	CPU2_DIMM 3	
	14	CPU2_DIMM 7	
	8	CPU2_DIMM 4	
	16	CPU2_DIMM 8	
	12	CPU2_DIMM 6	
	4	CPU2_DIMM 2	
	10	CPU2_DIMM 5	
	2	CPU2_DIMM 1	
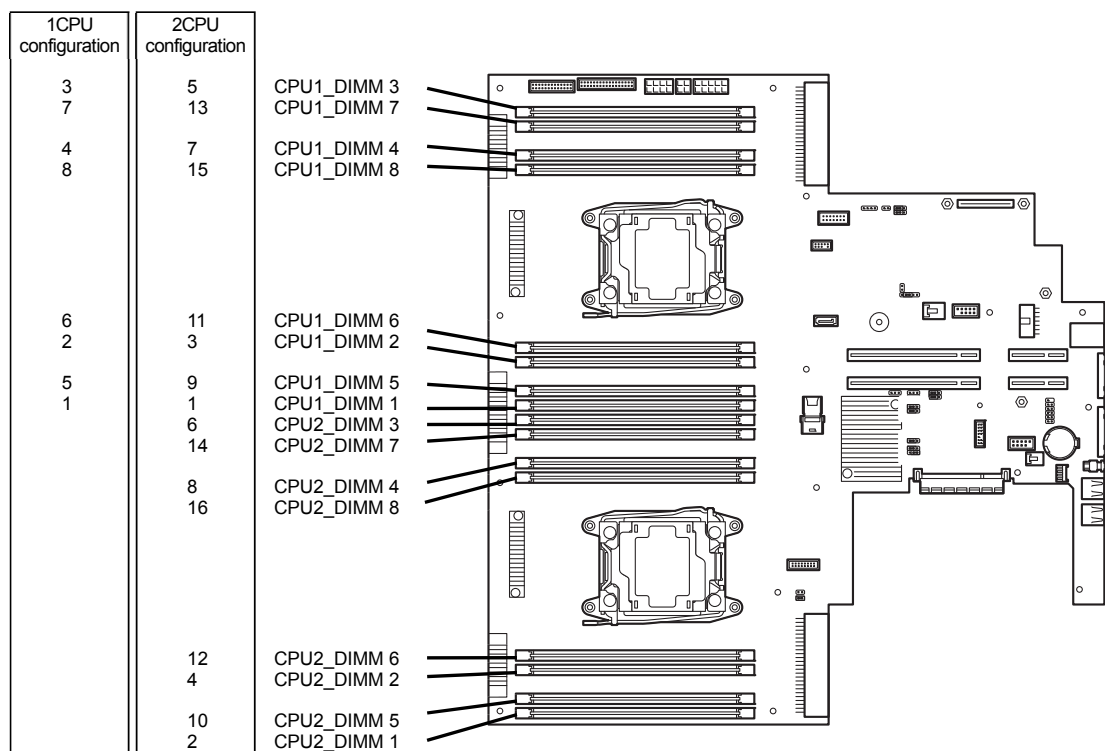
1.8.5   Installation

Install a DIMM by using the following procedure.

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

2. Open levers on left and right sides of
    DIMM slot, and remove the dummy cover.
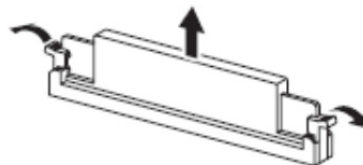
Note	Keep the removed dummy cover for future use.

3. Push the DIMM straight into the socket.
    When a DIMM is inserted into the socket,
    the lever automatically closes.

    Key slot

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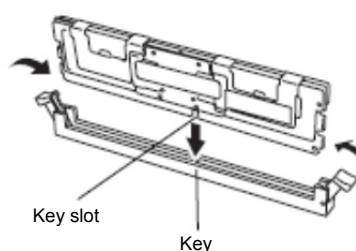
Important	• **Make sure the orientation of the DIMM. The DIMM has a notch, preventing being incorrectly inserted.**
	• **Do not apply too much pressure when you push a DIMM into the socket. Doing so can damage the socket or terminal part.**

4. Continue to install or remove internal options, mount and connect the server, and turn it on.

5. Confirm that no error messages are displayed in POST screen.
    If any error messages are displayed, see *Chapter 3 (1. POST Error Message)* in "*Maintenance Guide*".

6. Run BIOS Setup Utility, and select **Memory Configuration** and then **Memory Information** from the
    Advanced menu. Make sure the capacity of added DIMM is displayed properly.
    See *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*".

7. Select **Memory Configuration** from the **Advanced** menu, and then specify **Yes** for **Memory Retest**.
    After that, select **Save Changes and Exit** to reboot.

8. Specify **One Time** for **Power Measurement Policy** in **Server**.
    After the completion of the setting, select **Save Changes and Exit** to reboot.

9. Set the size of Paging File to the recommended value (total memory size x 1.5) or more.
    If using a Windows OS, see *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in
    "*Installation Guide (Windows)*".
    For other OS, follow the manual of the OS.

1.8.6   **Removal / Replacement**

To remove DIMM, reverse the installation procedure.

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

Important	**Failing to install dummy cover to vacant slot may cause malfunction of the server due to insufficient cooling effect.**
Note	When removing a defective DIMM, check error messages displayed at POST or NEC ESMPRO and check the DIMM socket where the defective DIMM is installed.

Follow the steps below after replacing or removing DIMMs.

1. 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*".

2. Run BIOS Setup Utility, select **Memory Configuration** from the **Advanced** menu, and then specify **Yes** for **Memory Retest**. After that, select **Save Changes and Exit** to reboot.

3. Specify **One Time** for **Power Measurement Policy** in **Server**.
   After the completion of the setting, select **Save Changes and Exit** to reboot.

4. Set the size of Paging File to the recommended value (total memory size x 1.5) or more.
   If using a Windows OS, see *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "*Installation Guide (Windows)*".
   For other OS, follow the manual of the OS.

1.8.7   **Cluster On Die setting, Early Snoop setting**

The following two items are provided in the **Memory Configuration** submenu in **Advanced** of the system BIOS setup utility (SETUP).

Item	Parameter	Description
Cluster On Die	[Disabled] Enabled	Enable or disable the Cluster On Die function. This item can be selected after installing the processor that supports this function and by specifying [Enabled] for **NUMA**. ・In the following OS, specify [Disabled] for this item. 　－ VMware ESXi 5
Early Snoop	Disabled [Enabled]	Enable or disable the Early Snoop function. This item can be selected by specifying [Disabled] for **Cluster On Die**.

Pay attention to the number of installed DIMMs when specifying [Enabled] for **Cluster On Die**.

● In the case of 1 CPU configuration

   Install DIMM to at least all the slots from CPU1_DIMM1 through DIMM3.

● In the case of 2 CPU configuration

   Install DIMM to at least all the slots from CPU1_DIMM1 through DIMM3 and CPU2_DIMM1 through DIMM3.

It is recommended to install DIMM for the following numbers for the purpose of effectively utilizing the Cluster On Die function of the processor.

● In the case of 1 CPU configuration

   Install DIMM to the slots from CPU1_DIMM1 through DIMM8.

   Or, install DIMM to the slots from CPU1_DIMM1 through DIMM12.

● In the case of 2 CPU configuration

   Install DIMM to the slots from CPU1_DIMM1 through DIMM4 and CPU2_DIMM1 through DIMM4.

   Or, install DIMM to the slots from CPU1_DIMM1 through DIMM8 and CPU2_DIMM1 through DIMM8.

For details about the DIMM installation order, see Section 1.8.4, "DIMM expansion order".

● 1CPU configuration (Memory RAS Mode: Independent)

Number of DIMMs	Cluster On Die function	Target DIMM slot
1 set	Unavailable	CPU1_DIMM1
2 sets	Unavailable	CPU1_DIMM1 ～ CPU1_DIMM2
3 sets	Available	CPU1_DIMM1 ～ CPU1_DIMM3
4 sets	Available (Recommended)	CPU1_DIMM1 ～ CPU1_DIMM4
5 sets	Available	CPU1_DIMM1 ～ CPU1_DIMM5
6 sets	Available	CPU1_DIMM1 ～ CPU1_DIMM6
7 sets	Available	CPU1_DIMM1 ～ CPU1_DIMM7
8 sets	Available (Recommended)	CPU1_DIMM1 ～ CPU1_DIMM8

● 1CPU configuration (Memory RAS Mode: Mirroring/ Lockstep)

Number of DIMMs	Cluster On Die function	Target DIMM slot
2 sets	Unavailable	CPU1_DIMM1 ～ CPU1_DIMM2
4 sets	Available (Recommended)	CPU1_DIMM1 ～ CPU1_DIMM4
6 sets	Available	CPU1_DIMM1 ～ CPU1_DIMM6
8 sets	Available (Recommended)	CPU1_DIMM1 ～ CPU1_DIMM8

● 1CPU configuration (Memory RAS Mode: Sparing)

Number of DIMMs	Cluster On Die function	Target DIMM slot
2 sets	Unavailable	CPU1_DIMM1 & CPU1_DIMM5
4 sets	Unavailable	CPU1_DIMM1 ～ CPU1_DIMM2, CPU1_DIMM5 ～ CPU1_DIMM6
6 sets	Available	CPU1_DIMM1 ～ CPU1_DIMM3, CPU1_DIMM5 ～ CPU1_DIMM7
8 sets	Available (Recommended)	CPU1_DIMM1 ～ CPU1_DIMM8

1.8.8　　**Using Memory RAS Feature**

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

Note	• See *List of features supported by additional memory board* in *1.8.3 Memory RAS Feature* before using memory RAS feature. • Only the features that additional memory board supports can be used.

The memory area on the motherboard of the server is divided into four memory channels.
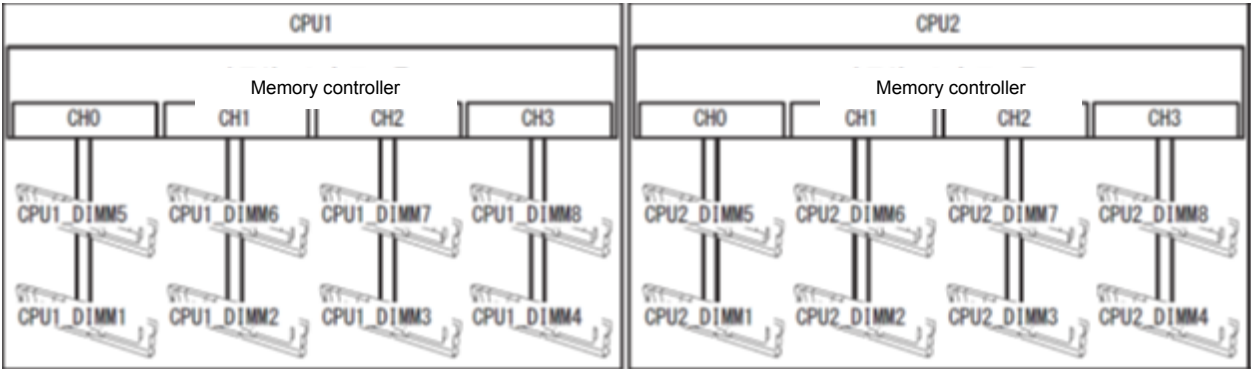
Memory Mirroring, Memory Lock Step, and Memory Sparing features keep memory redundancy between memory channels by monitoring or altering memory active/inactive status, respectively.

(1)   Memory Mirroring Feature

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

Note	• Memory Mirroring feature uses channels 0 and 1 or channels 2 and 3. • To use Memory Mirroring feature, install N8102-680/681 additional memory board (two DIMMs of same model). • DIMMs used in mirror set must be of the same model number.

Example: 2-CPU configuration
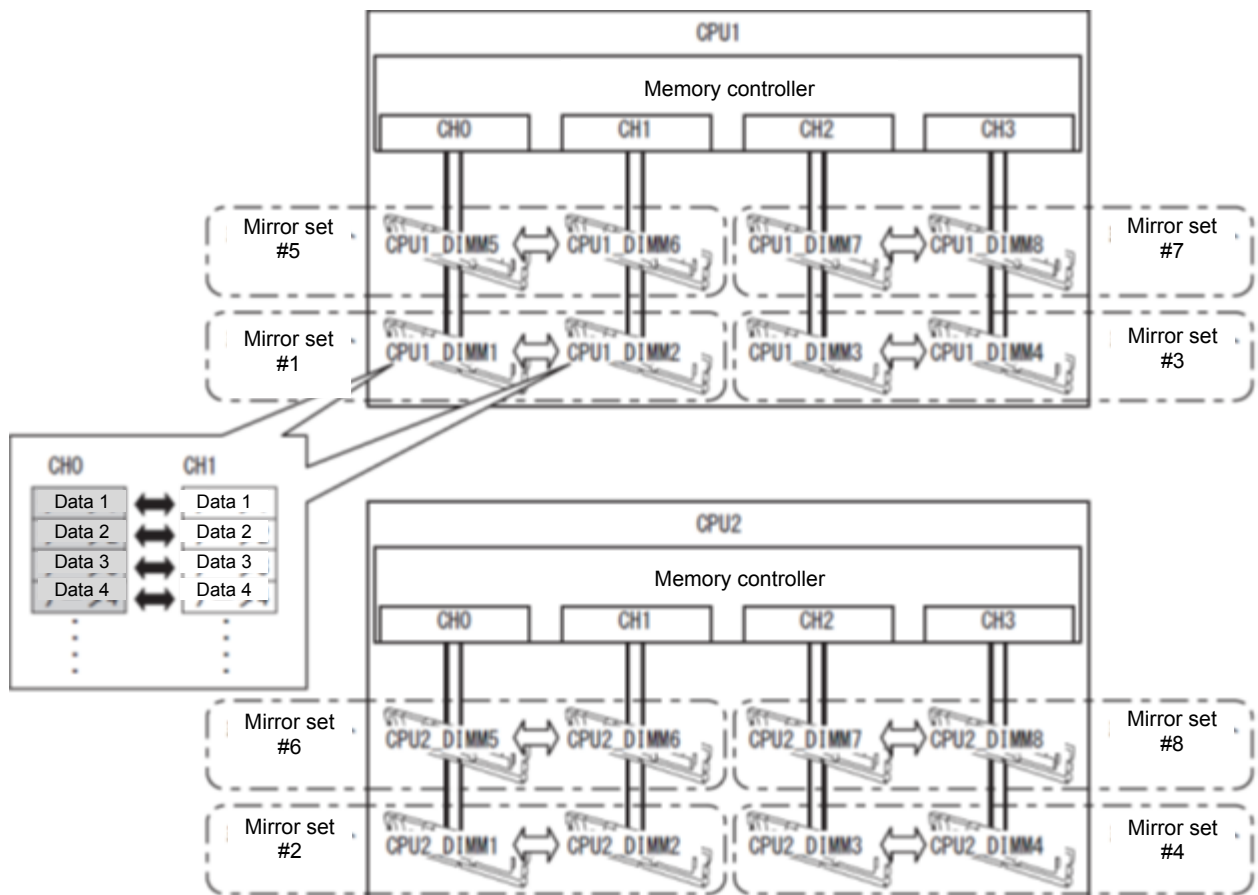
Tips	The operating system can use a half of the total physical memory capacity.

Memory Mirroring feature can be used under the following conditions:

- Install DIMMs in DIMM sockets to configure a mirror set.

- All the installed DIMMs must be the same capacity.

- See *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*", check if your server supports Memory Mirroring feature.
  Select **Advanced** → **Memory Configuration** → **Memory Information**, and check if **Supported** is displayed in **Mirroring**.

- See *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*" to change parameters as shown below.
  Advanced → **Memory Configuration** → **Memory RAS Mode** → Change to **Mirroring**.

- After restart, run SETUP again, and check if "**Mirrored**" is displayed for the following parameter.
  Advanced → **Memory Configuration** → **Memory Information** → **CPUx_DIMMx Status**

- Installation order depends on CPU configuration. See the figure below.
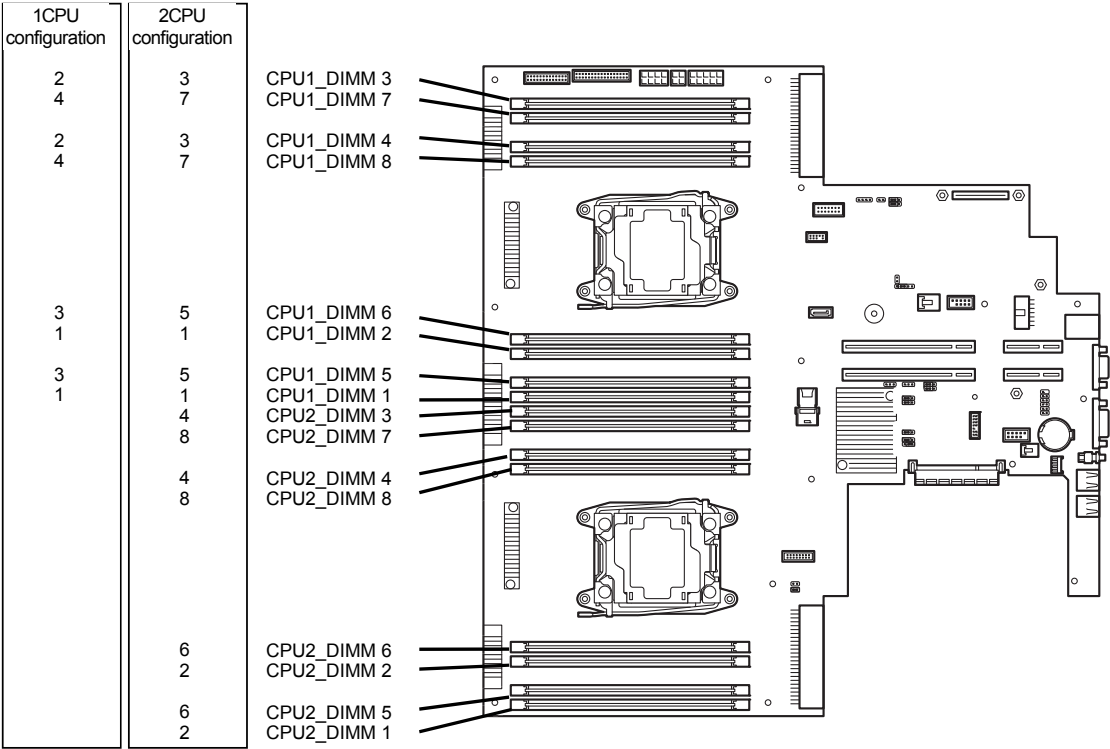
Memory Mirroring cannot be configured in the following case:

- Memory Mirroring within a specific memory channel

Notes on Configuring Memory Mirroring

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

- When you additionally install DIMMs that unable to configure Memory Mirroring
- When you remove DIMMs that takes down Memory Mirroring

(2)　Memory Lock Step Feature (x8 SDDC)

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

Note	• Memory LockStep feature uses channels 0 and 1 or channels 2 and 3.
	• To use Memory LockStep feature, install N8102-683/684 additional memory board (two DIMMs of same model).
	• DIMMs used in LockStep set must be of the same model number.
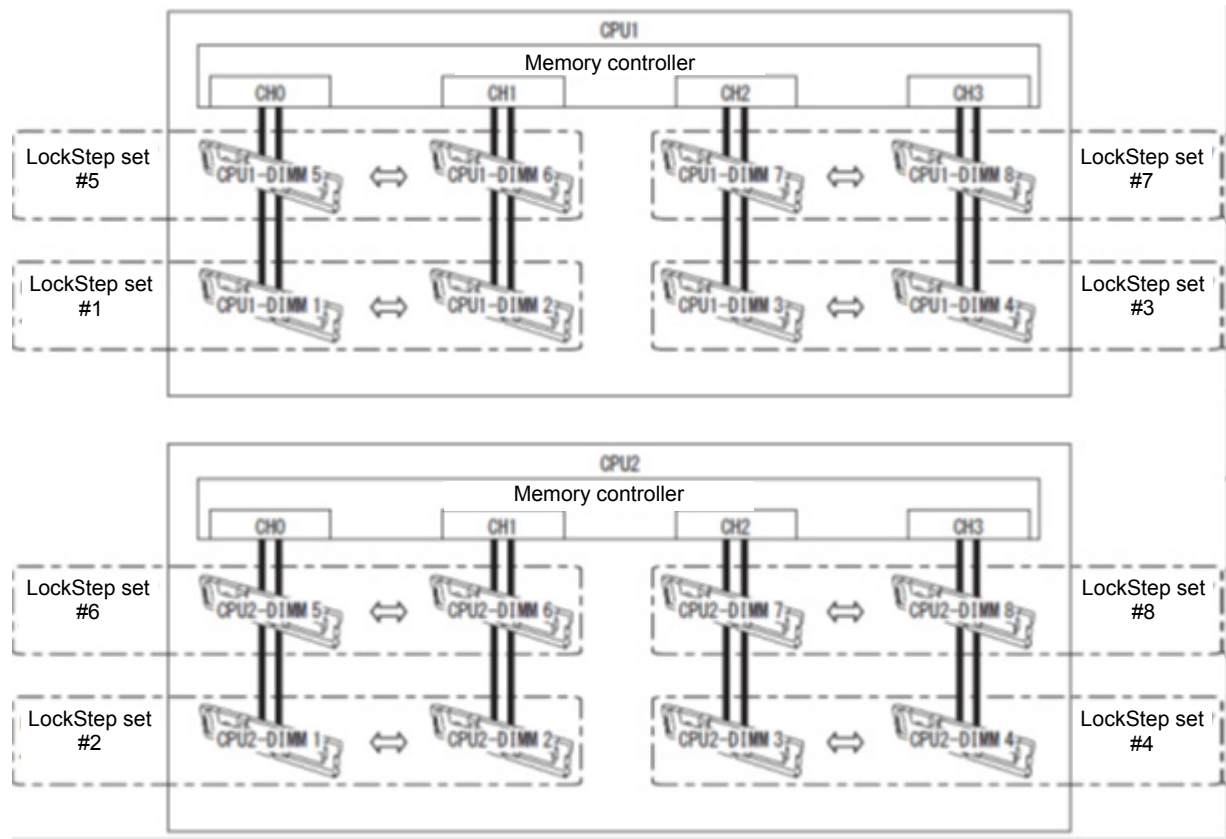
Memory Lock Step feature can be used under the following conditions:

- Install DIMMs in DIMM socket to configure a Lock Step set.

- All the installed DIMMs should have the same capacity.

- See *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*" to change parameters as shown below.
  Advanced → **Memory Configuration** → **Memory RAS Mode** → Change to **LockStep**.

- After restart, run SETUP again, and check if "**Lock Step**" is displayed for the following parameter.
  Advanced → **Memory Configuration** → **Memory Information** → **CPUx_DIMMx Status**

- Installation order depends on CPU configuration. See the figure below.
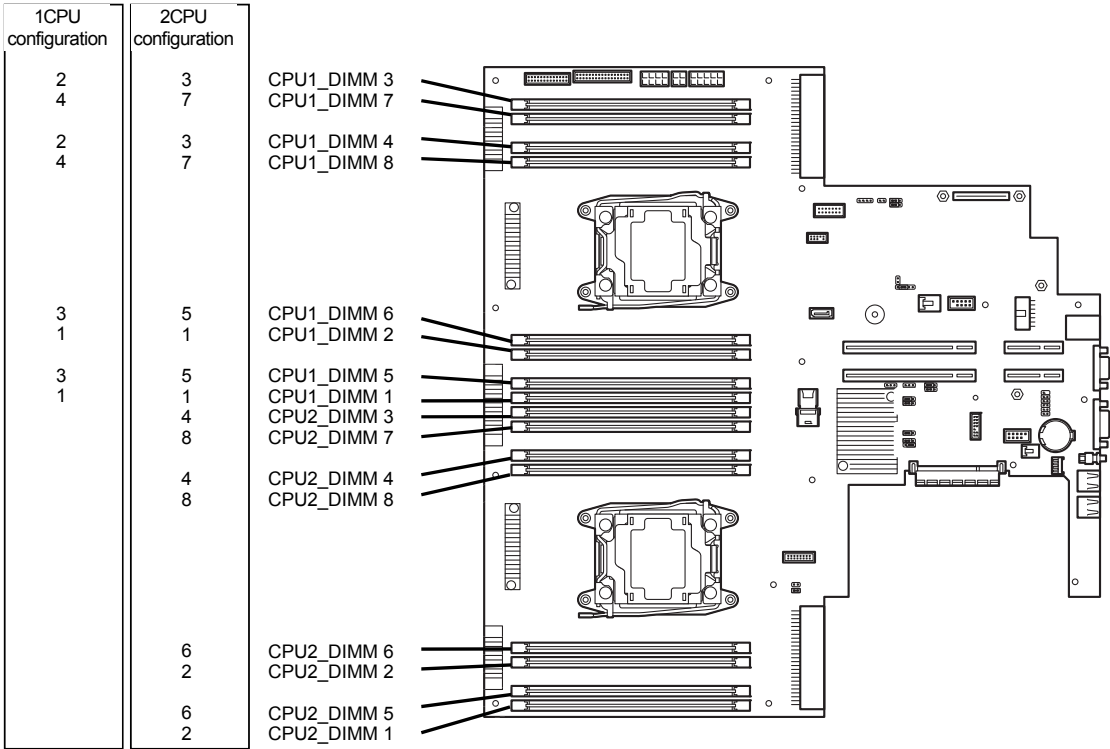
Memory Lock Step cannot be configured in the following cases:

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

Notes on Configuring Lock Step

In Memory Lock Step configuration, **Memory RAS Mode** menu is changed from "**Lock Step**" to "**Independent**"
in the following cases:

- When you additionally install DIMMs that unable to configure Memory Lock Step
- When you remove DIMMs that takes down Memory Lock Step

(3)   Memory Sparing Feature

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

Note	To use Memory Sparing feature, install N8102-622/623 additional memory board (three DIMMs of same model). DIMMs installed in the system must be of the same model number.

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

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

Number of CPUs	Number of DIMMs	Capacity of DIMM installed	
		16GB DIMM	**32GB DIMM**
1	2	24GB	48GB
	4	48GB	72GB
	6	72GB	86GB
	8	96GB	120GB
2	4	48GB	96GB
	6	72GB	120GB
	8	96GB	144GB
	10	120GB	168GB
	12	144GB	192GB
	14	168GB	216GB
	16	192GB	240GB
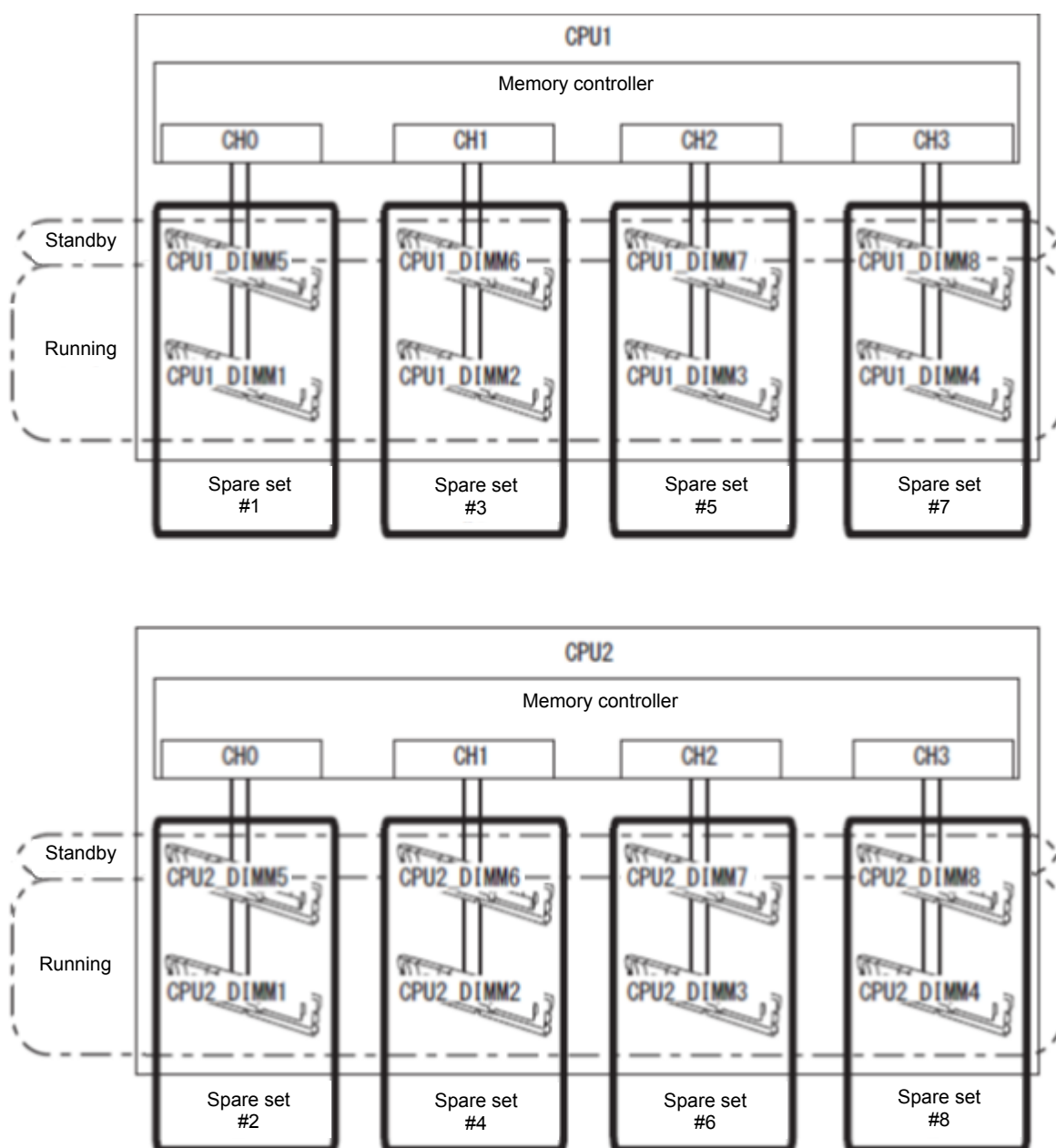
Memory Sparing feature can be used under the following conditions:

- Install DIMMs in DIMM socket to configure a spare set.

- DIMMs to be installed must be the same capacity.

- See *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*", check if your server supports Memory Sparing feature.
  Select **Advanced** → **Memory Configuration** → **Memory Information**, and check if **Supported** is displayed in **Sparing**.

- See *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*" to change parameters as shown below.
  Advanced → **Memory Configuration** → **Memory RAS Mode** → Change to **Sparing**.

- After restart, run SETUP again, and check if "**Spared**" is displayed for the following parameter.
  Advanced → **Memory Configuration** → **Memory Information** → **CPUx_DIMMx Status**

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

1CPU configuration	2CPU configuration	DIMM
3	5	CPU1_DIMM 3
3	5	CPU1_DIMM 7
4	7	CPU1_DIMM 4
4	7	CPU1_DIMM 8
2	3	CPU1_DIMM 6
2	3	CPU1_DIMM 2
1	1	CPU1_DIMM 5
1	1	CPU1_DIMM 1
	6	CPU2_DIMM 3
	6	CPU2_DIMM 7
	8	CPU2_DIMM 4
	8	CPU2_DIMM 8
	4	CPU2_DIMM 6
	4	CPU2_DIMM 2
	2	CPU2_DIMM 5
	2	CPU2_DIMM 1
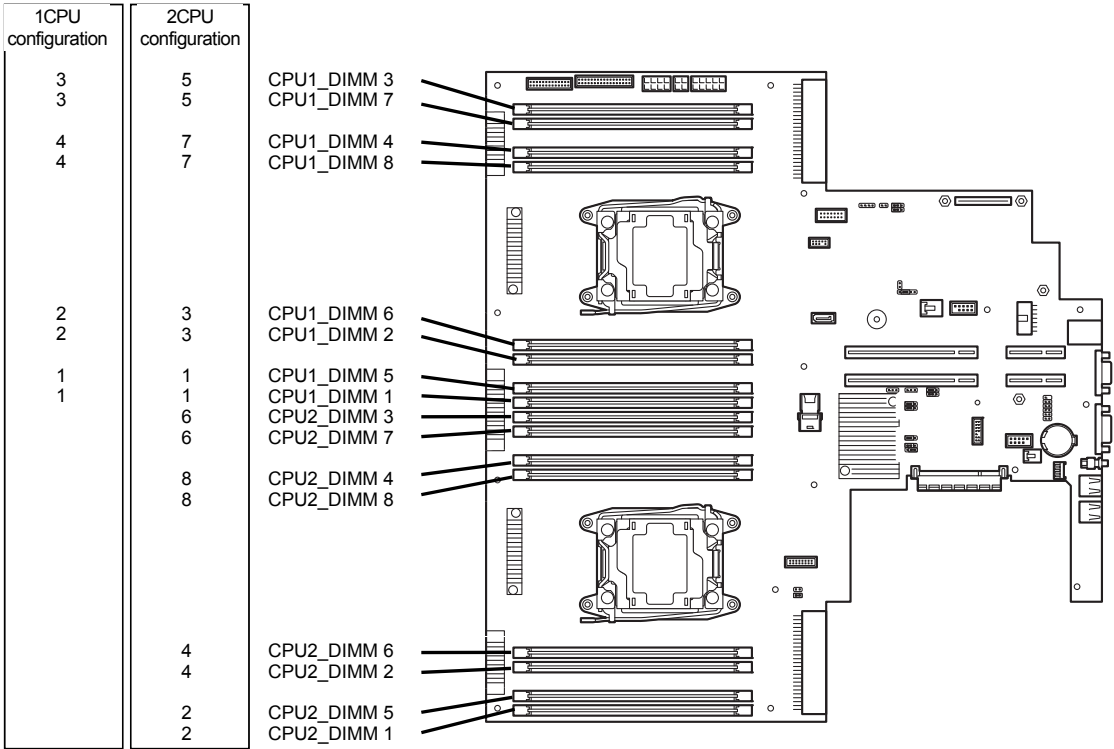
The following Memory Sparing cannot be configured.

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

Notes on Configuring Memory Sparing

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

- When you additionally install DIMMs that unable to configure Memory Sparing
- When you remove DIMMs that takes down Memory Sparing

1.9   Flash Backup Unit for RAID Controller

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

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

1.9.1   Handling precautions

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

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

1.9.2   Installing N8103-181 Flash Backup Unit

This section describes the procedure of installing an FBU for RAID controller.

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

2. Remove the two screws and remove the PCI riser card.
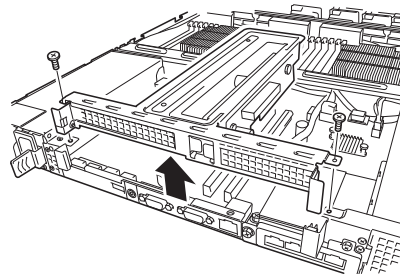
3. Remove the battery tray for RAID controller.
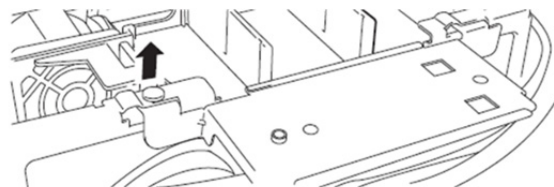
4. Turn the battery tray for RAID
    controller the other way, and mount
    the FBU.
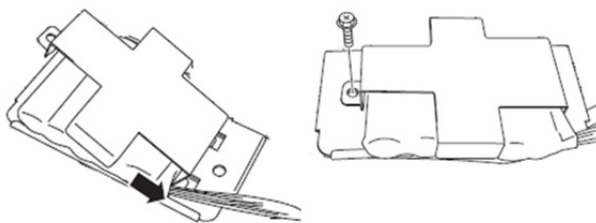
5. Mount the battery tray for RAID
    controller.
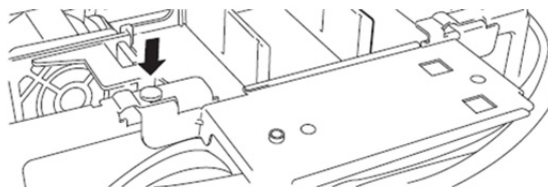
6. Connect the FBU control cable (650
    mm) that comes with FBU.
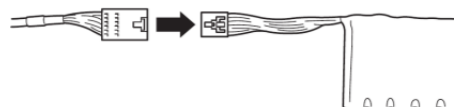
7. Remove the two screws from RAID
    controller, and remove PCI bracket.
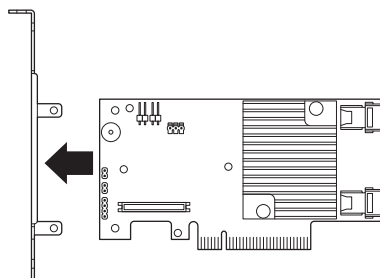
8. Mount the adapter to RAID controller.
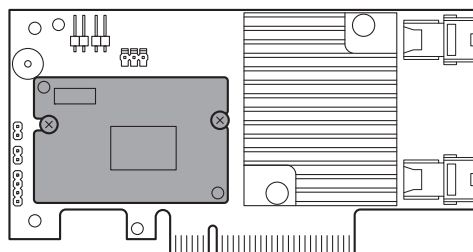
9. Connect the control cable of FBU to
    RAID controller.
    Align the connector on FBU control
    cable with the black marking on RAID
    controller, then connect the FBU
    control cable.
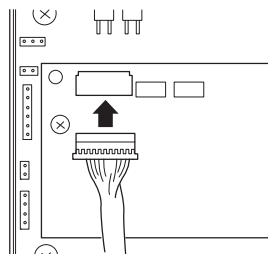
10. Remove the two screws from server chassis, and remove the RAID controller bracket.
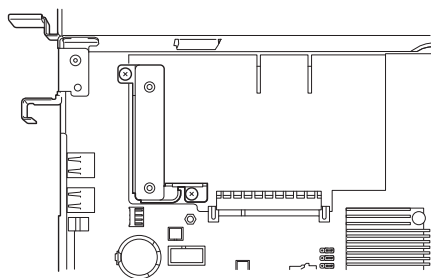
11. Install the RAID controller bracket to RAID controller using two screws removed in step 5.
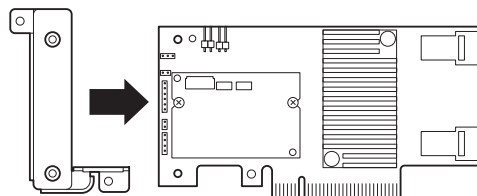
12. Install RAID controller to the RAID controller connector on motherboard, using two screws removed in step 8.
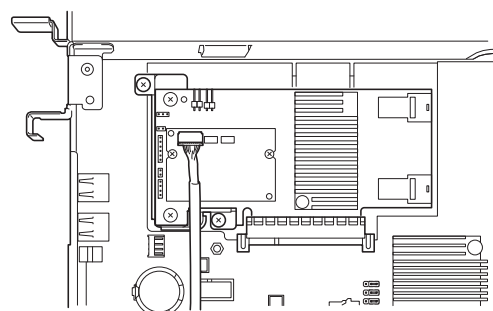
13. Connect Mini SAS HD cable to RAID controller.
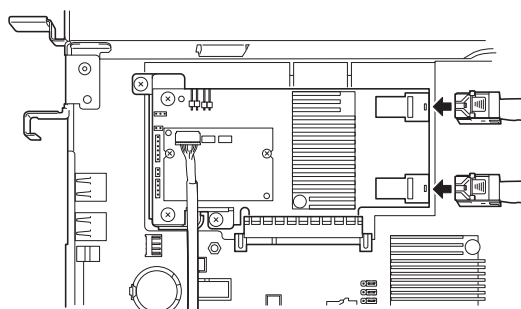
14. Disconnect USB cable (for front) from motherboard.
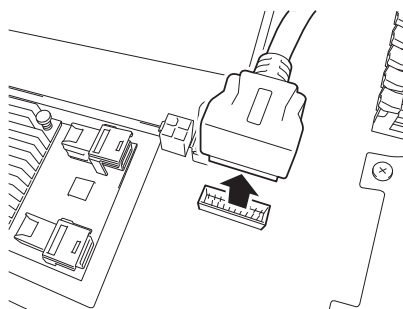
15. Connect Mini SAS HD cable to RAID
    controller.
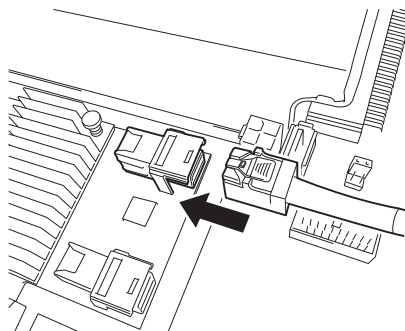
16. Connect USB cable (for front) to
    motherboard.
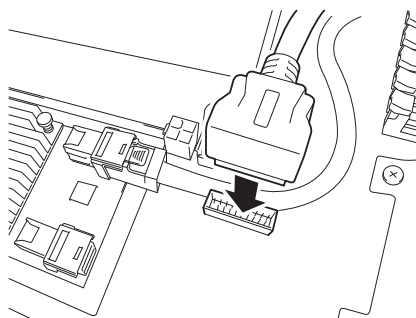
17. Install the PCI riser card removed in
    step 2.
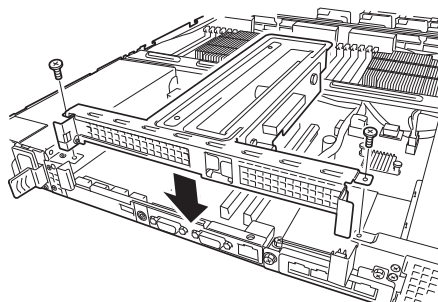
1.9.3   Removal

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

1.9.4　**Installing FBU for N8103-179**

Follow the steps below to install FBU.

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

2. Remove the two screws, then remove the PCI riser card.
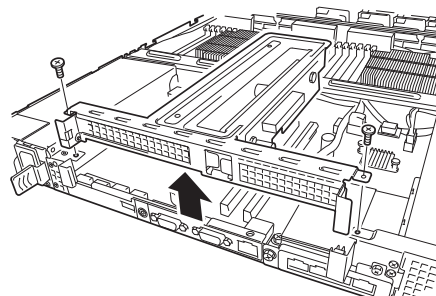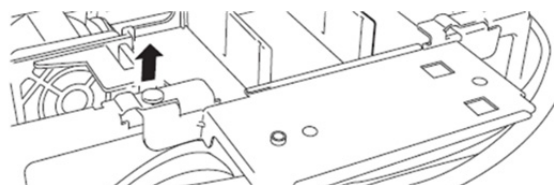
3. Remove the battery tray for RAID controller.

4. Turn the battery tray for RAID controller the other way, and mount the FBU.
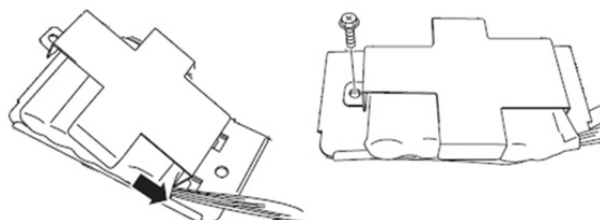
5. Mount the battery tray for RAID controller.
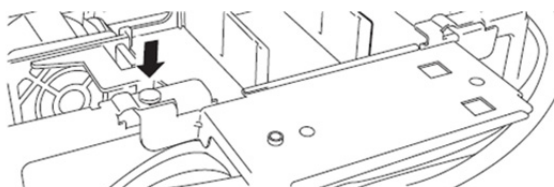
6. Connect the FBU control cable (750 mm) that comes with RAID controller, to the FBU.
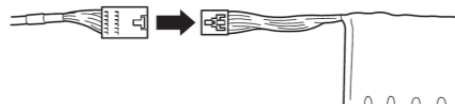
7. Connect the FBU control cable (750 mm) and Mini SAS cable to RAID controller. Align the black marking on connector of FBU control cable with that on connector of RAID controller.
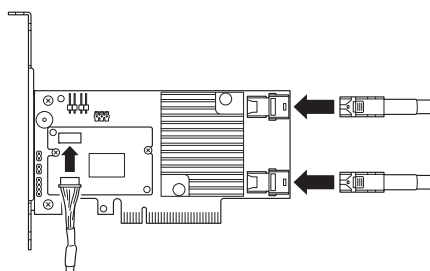
8. Remove one screw from the blank
    cover on the PCI riser card (removed
    in step 2) on which you are going to
    mount the RAID controller, then
    remove the blank cover.
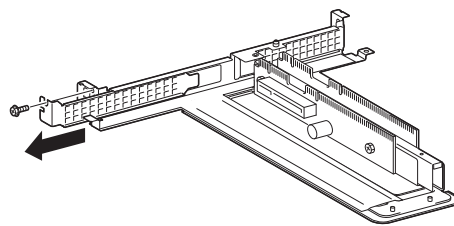
9. Mount the RAID controller to the PCI
    riser card, and secure it with one
    screw removed in step 6.
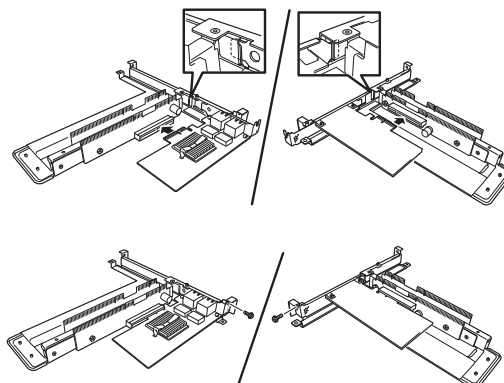
10. Mount the PCI riser card removed in
    step 2.
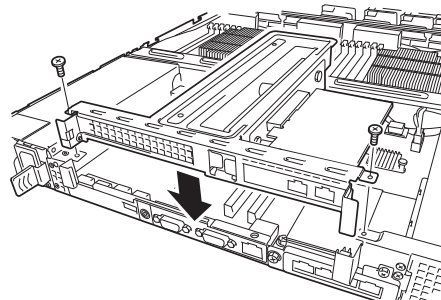
Note	Keep the removed blank cover for future use.

1.9.5   **Removing FBU**

Remove the FBU in reverse order of installation procedure.

1.10 LOM Card

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

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

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

1.10.1 Installation

Follow the steps below to install the LOM card.

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

2. Remove the screw that secures the PCI riser card, and remove the PCI riser card.
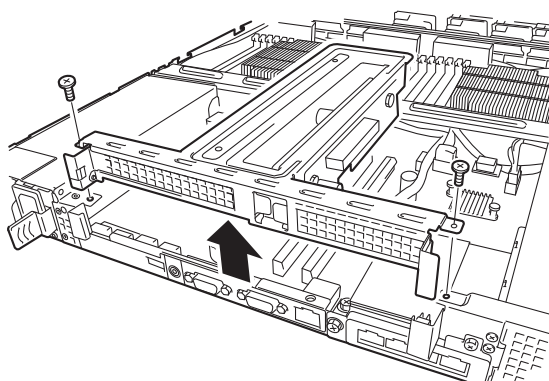
3. Remove the screws from the bracket.
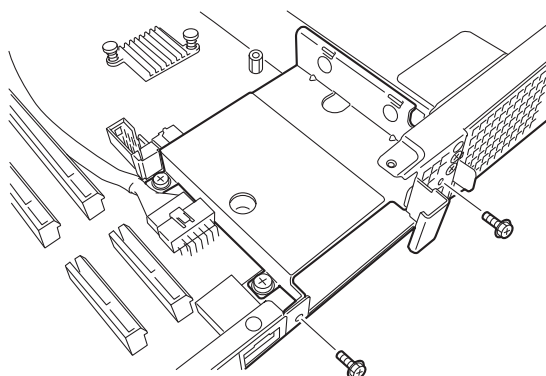
4. Remove the bracket.

5. Remove two screws from the motherboard.
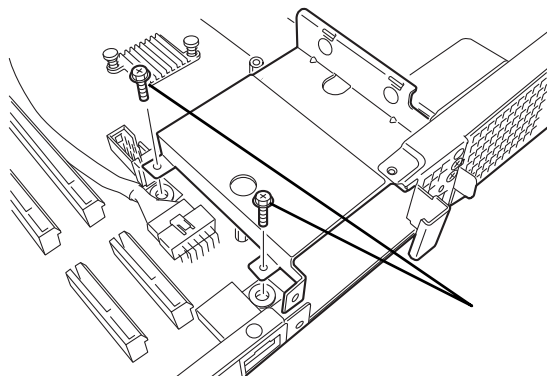
6. Align the pin terminals of LOM card with the LOM card slot, insert the card firmly, and secure the card with three screws.
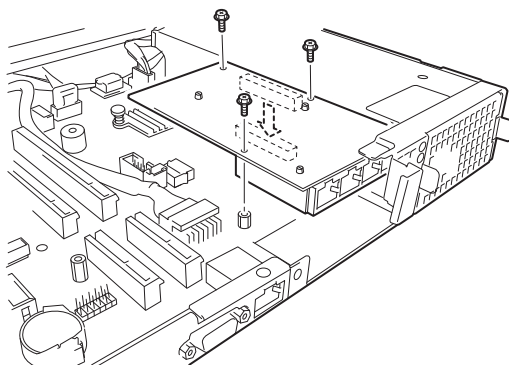
7. Mount the LOM card bracket to motherboard and secure it with two screws removed in step 5.
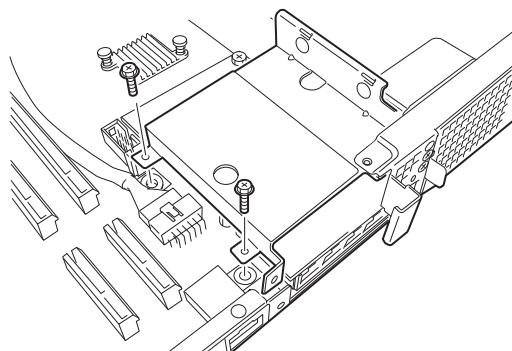
8. Use the two screws removed in step 3 to mount the port cover that comes with LOM card.
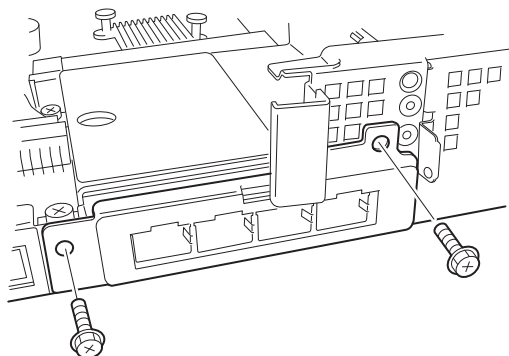
9. Mount the PCI riser card removed in step 2.

1.10.2   **Removal**

Remove the LOM card in reverse order of installation steps.

1.11 PCI Card

This server provides PCI slots for riser card (one full-height PCI card and one low-profile PCI card), a slot for LOM card, and a slot for RAID controller (total four PCI cards can be mounted).

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

1.11.1 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.

- Available type of PCI card depends on riser card. Make sure the card type before connecting it to riser card.

- The server provides no connector to connect an LED connector which is supplied in RAID controller used to indicate disk access.

- PCI slot number "1A" is assigned to the RAID controller slot, "1B" is assigned to LOM card slot, "1C" is assigned to the riser card for full-height PCI card, and "1D" is assigned to the riser card for low-profile PCI card.

- The search order for PCI bus slot on boot is as follows.
  Slot 1A (for RAID controller) → Slot 1B (for LOM card) → Slot 1C (for full-height card) → Slot 1D (for low-profile card)

- The PCI devices of the same type (including onboard PCI device) may be recognized in different order from those described above, depending on OS or RAID Configuration Utility. Check the slot location of PCI device by PCI bus number, device number and function number shown in the table below.

PCI device	Bus number	Device number	Function number
LOM card LAN1 (when N8104-154F/155F/156F is installed)	05h	0	0
LOM card LAN2 (when N8104-154F/155F/156F is installed)	05h	0	1
LOM card LAN3 (when N8104-154F/156F is installed)	05h	0	2
LOM card LAN4 (when N8104-154F/156F is installed)	05h	0	3
Slot 1A dedicated for RAID Controller	01h	0	0
PCIe slot 1C (Full height)	0Ch	0	X
PCIe slot 1D (Low profile)	40h	0	X
PCIe x16 slot 1C (Full height)	81h	0	X
PCIe x16 slot 1D (Low profile)	C0h	0	X

- If an additional LAN card is installed, it is hard to push the catch of the connector with your finger that is connected to the LAN card. Disconnect the connector pushing the catch with a standard screwdriver. At this time, be very careful for the screwdriver not to damage the LAN card.

- If a bootable device such as a PCI card or USB device is added, the boot order may change.
  In BIOS Setup Utility, select **HDD Priorities** from **Boot** menu and confirm the boot order.
  Boot → **HDD Priorities** → Check the display
  If the boot device is an HDD and located 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.

- For a RAID controller, LAN card (network boot), or Fibre Channel controller, if a hard disk drive on which an OS is installed is connected, set the option ROM for that slot to **Enabled**. See *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*" for how to specify it.

1.11.2   Supported PCI cards and available slots

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

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

(1)   Standard riser card

(1/3)

Model	Product name		Standard riser card			Remarks
		Slot number	#1A	#1B	#1D	
		PCI standard	PCIe 3.0			
		PCI slot performance *1	x8 lane			
		PCI card type *2	x8 socket			
		Transfer bandwidth (per lane) *1	8Gb/s			
		Slot size	For RAID Controller	For LOM card	Low profile	
		Available card size			220mm max.	
N8103-176	RAID Controller (1GB, RAID 0/1) [PCI Express 3.0(x8)]		○	―	―	Dedicated to connect with internal hard disk drive. Choose one card (N8103-176, N8103-177, or N8103-178). Flash Backup Unit [N8103-181] can be mounted.
N8103-177	RAID Controller (1GB, RAID 0/1/5/6) [PCI Express 3.0(x8)]		○	―	―	
N8103-178	RAID Controller (2GB, RAID 0/1/5/6) [PCI Express 3.0(x8)]		○	―	―	
N8103-179	RAID Controller (2GB, RAID 0/1/5/6) [PCI EXPRESS 3.0(x8)]		―	―	○	Dedicated to connect with external devices. Flash Backup Unit is factory installed
N8103-142	SAS Controller [PCI Express 2.0(x8)]		―	―	○	Dedicated to connect with external devices.
N8103-184	SAS Controller [PCI Express 3.0(x8)]		―	―	○	Dedicated to connect with external devices.

(2/3)

Model	Product name	Slot number	Standard riser card			Remarks	
			#1A	#1B	#1D		
		PCI standard	PCIe 3.0				
		PCI slot performance *1	x8 lane				
		PCI card type *2	x8 socket				
		Transfer bandwidth (per lane) *1	8Gb/s				
		Slot size	For RAID Controller	For LOM card	Low profile		
		Available card size			220mm max.		
N8190-159	Fibre Channel Controler (8Gbps/Optical) [PCI Express 2.0(x8)]		―	―	〇	For connecting with external Fibre Channel device	
N8190-160	Fibre Channel Controler (2ch) (8Gbps/Optical) [PCI Express 2.0(x8)]		―	―	〇	For connecting with external Fibre Channel device	
N8190-157 A	Fibre Channel Controler (16Gbps/Optical) [PCI Express 3.0(x8)]		―	―	〇	For connecting with external Fibre Channel device	
N8190-158 A	Fibre Channel Controler(2ch) (16Gbps/Optical) [PCI Express 3.0(x8)]		―	―	〇	For connecting with external Fibre Channel device	
N8104-154	1000BASE-T LOM card (4ch) [PCI Express 2.0(x4)]		―	〇	―	For additional LAN port Card type: PCI Express 2.0 (x8)	
N8104-150	1000BASE-T Adapter (1ch) [PCI Express 2.0(x1)]		―	―	〇	For additional LAN port. Card type: PCI Express 2.0 (x4)	
N8104-151	1000BASE-T Adapter (2ch) [PCI Express 2.0(x1)]		―	―	〇	For additional LAN port. Card type: PCI Express 2.0 (x4)	
N8104-145	1000BASE-T Adapter (2ch) [PCI Express 2.0(x4)]		―	―	〇	For additional LAN port.	
N8104-152	1000BASE-T Adapter (4ch) [PCI Express 2.0(x4)]		―	―	〇	For additional LAN port. A LAN cable with modular cover cannot be used.	
N8104-155 *5	10GBASE-T LOM card (2ch) [PCI Express 3.0(x8)]		―	〇	―	For additional LAN port	Up to two cards in total can be installed. *4
N8104-153	10GBASE-T Adapter (2ch) [PCI Express 2.0(x8)]		―	―	〇	For additional LAN port	
N8104-157	10GBASE-T Adapter (2ch) [PCI Express 3.0(x4)		―	―	〇	For additional LAN port	
N8104-156	10GBASE-SFP+(2ch)+ 1000BASE-T(2ch) LOM card [PCI Express 3.0(x8)]		―	〇	―	For additional LAN port. Prepare SFP+ module N8104-129 if needed.	
N8104-149	10GBASE Adapter (SFP+/2ch) [PCI Express 2.0(x8)]		―	―	〇	For additional LAN port. Prepare SFP+ module N8104-129 if needed	
N8104-148	10GBASE Adapter (SFP+/2ch) [PCI Express 2.0(x8)]		―	―	〇	For additional LAN port. Prepare SFP+ module N8104-129 if needed	

(3/3)

Model	Product name	Slot number	Standard riser card #1A	#1B	#1D	Remarks
82		PCI standard	PCIe 3.0			
		PCI slot performance *1	x8 lane			
		PCI card type *2	x8 socket			
		Transfer bandwidth (per lane) *1	8Gb/s			
		Slot size	For RAID Controller	For LOM card	Low profile	
		Available card size			220mm max.	
N8104-146	InfiniBand Adapter (1ch) (FDR/Optical) [PCI Express 3.0(x8)]		－	－	○	For Infiniband connection
N8104-147	InfiniBand Adapter (2ch) (FDR/Optical) [PCI Express 3.0(x8)]		－	－	○	For Infiniband connection
N8118-01	PCI SSD Adapter (365GB) (PCI Express 2.0(x4))		－	－	○	SSD to be mounted to PCI slot
N8117-01A	Additional RS-232C connector *3		－	－	○	For additional serial port B (RS-232C) Only one unit can be mounted at the maximum.

○: Can be mounted, –: Cannot be mounted

*1   Data transfer rate of PCI slot = Transfer bandwidth × Number of lanes
      <Example> x8 lane = 64 Gbps (one-way)
*2   Connector size. Cards exceeding the number of sockets cannot be connected.
      <Example> x4 socket can connect with x1 and x4 cards, but not x8 card.
*3   Use RS-232C cable (B).
*4   Performance of LAN depends on the application and memory capacity. If you want to mount three or more 10G LAN cards, a sufficient verification under your system environment is needed.
*5   Change the "Above 4G decoding" setting to [Disabled] to use the PXE Boot function if you set Boot Mode to [Legacy].

(2) 8116-39 riser card (PCIex8) (option)

(1/2)

Model	Product name	Slot number	#1A	#1B	#1C	#1D	Remarks	
		PCI standard	PCIe 3.0					
		PCI slot performance *1	x8 lane					
		PCI card type *2	x8 socket					
		Transfer bandwidth (per lane) *1	8Gb/s					
		Slot size	For RAID Controller	For LOM card	Full height	Low profile		
		Available card size			220mm max.			
N8103-176	RAID Controller (1GB, RAID 0/1) [PCI Express 3.0(x8)]		○	―	―	―	Dedicated to connect with internal hard disk drive. Choose one card (N8103-176, N8103-177, or N8103-178). Flash Backup Unit [N8103-181] can be mounted.	Up to two cards can be installed including Flash Backup Unit
N8103-177	RAID Controller (1GB, RAID 0/1/5/6) [PCI Express 3.0(x8)]		○	―	―	―		
N8103-178	RAID Controller (2GB, RAID 0/1/5/6) [PCI Express 3.0(x8)]		○	―	―	―		
N8103-179	RAID Controller (2GB, RAID 0/1/5/6) [PCI EXPRESS 3.0(x8)]		―	―	○	○	Dedicated to connect with external devices. Flash Backup Unit is factory installed	
N8103-142	SAS Controller [PCI Express 2.0(x8)]		―	―	○	○	Dedicated to connect with external devices.	
N8190-159	Fibre Channel Controller (8Gbps/Optical) [PCI Express 2.0(x8)]		―	―	○	○	For connecting with external Fibre Channel device	
N8190-160	Fibre Channel Controller(2ch) (8Gbps/Optical) [PCI Express 2.0(x8)]		―	―	○	○	For connecting with external Fibre Channel device	
N8190-157 A	Fibre Channel Controller (16Gbps/Optical) [PCI Express 3.0(x8)]		―	―	○	○	For connecting with external Fibre Channel device	When the server equipped with Xeon E5-2603v3 is used in 1-CPU configuration, up to two port can be used.
N8190-158 A	Fibre Channel Controller(2ch) (16Gbps/Optical) [PCI Express 3.0(x8)]		―	―	○	○	For connecting with external Fibre Channel device	
N8104-154	1000BASE-T LOM card (4ch) [PCI Express 2.0(x4)]		―	○	―	―	For additional LAN port Card type: PCI Express 2.0 (x8)	
N8104-150	1000BASE-T Adapter (1ch) [PCI Express 2.0(x1)]		―	―	○	○	For additional LAN port. Card type: PCI Express 2.0 (x4)	
N8104-151	1000BASE-T Adapter (2ch) [PCI Express 2.0(x1)]		―	―	○	○	For additional LAN port. Card type: PCI Express 2.0 (x4)	

(2/2)

Model	Product name	Slot number	#1A	#1B	#1C	#1D	Remarks	
		PCI standard	PCIe 3.0					
		PCI slot performance *1	x8 lane					
		PCI card type *2	x8 socket					
		Transfer bandwidth (per lane) *1	8Gb/s					
		Slot size	For RAID Controller	For LOM card	Full height	Low profile		
		Available card size			220mm max.			
N8104-145	1000BASE-T Adapter(2ch) [PCI Express 2.0(x4)]		—	—	○	○	For additional LAN port	
N8104-152	1000BASE-T Adapter (4ch) [PCI Express 2.0(x4)]		—	—	○	○	For additional LAN port. A LAN cable with modular cover cannot be used.	
N8104-155 *5	10GBASE-T LOM card (2ch) [PCI Express 3.0(x8)]		—	○	—	—	For additional LAN port	Up to three cards in total can be installed. *4 Up to two units of WS2008 (x86) can be installed.
N8104-153	10GBASE-T Adapter (2ch) [PCI Express 2.0(x8)]		—	—	○	○	For additional LAN port	
N8104-157	10GBASE-T Adapter (2ch) [PCI Express 3.0(x4)		—	—	○	○	For additional LAN port	
N8104-156	10GBASE-SFP+(2ch)+ 1000BASE-T(2ch) LOM card [PCI Express 3.0(x8)]		—	○	—	—	For additional LAN port. Prepare SFP+ module N8104-129 if needed	
N8104-149	10GBASE Adapter (SFP+/2ch) [PCI Express 2.0(x8)]		—	—	○	○	For additional LAN port. Prepare SFP+ module N8104-129 if needed	
N8104-148	10GBASE Adapter (SFP+/2ch) [PCI Express 2.0(x8)]		—	—	○	○	For additional LAN port. Prepare SFP+ module N8104-129 if needed	
N8104-146	InfiniBand Adapter (1ch) (FDR/Optical) [PCI Express 3.0(x8)]		—	—	○	○	SSD to be mounted to PCI slot	Cannot be used together with each other.
N8104-147	InfiniBand Adapter (2ch) (FDR/Optical) [PCI Express 3.0(x8)]		—	—	○	○	SSD to be mounted to PCI slot	
N8118-01	PCIe SSD Adapter (365GB) (PCI Express 2.0(x4))		—	—	○	○	SSD to be mounted to PCI slot	
N8117-01A	Additional RS-232C connector *3		—	—	○	○	For additional serial port B (RS-232C) Only one unit can be mounted at the maximum.	

○: Can be mounted, –: Cannot be mounted

*1   Data transfer rate of PCI slot = Transfer bandwidth × Number of lanes
       <Example> x8 lane = 64 Gbps (one-way)
*2   Connector size. Cards exceeding the number of sockets cannot be connected.
       <Example> x4 socket can connect with x1 and x4 cards, but not x8 card.
*3   Use RS-232C cable (B).
*4   Performance of LAN depends on the application and memory capacity. If you want to mount three or more 10G LAN cards, a sufficient verification
       under your system environment is needed.
*5   Change the "Above 4G decoding" setting to [Disabled] to use the PXE Boot function if you set Boot Mode to [Legacy].

(3)   N8116-33 riser card (PCIex16) (option)

(1/2)

Model	Product name	Slot number	#1A	#1B	#1C (2 CPUs required)	#1D (2 CPUs required)	Remarks	
		PCI standard	PCIe 3.0					
		PCI slot performance *1	x8 lane		X16 lane			
		PCI card type *2	x8 socket		X16 socket			
		Transfer bandwidth (per lane) *1	8Gb/s					
		Slot size	For RAID Controller	For LOM card	Full height	Low profile		
		Available card size			220mm max.			
N8103-176	RAID Controller (1GB, RAID 0/1) [PCI Express 3.0(x8)]		○	—	—	—	Dedicated to connect with internal hard disk drive. Choose one card (N8103-176, N8103-177, or N8103-178). Flash Backup Unit [N8103-181] can be mounted.	Up to two cards can be installed including Flash Backup Unit
N8103-177	RAID Controller (1GB, RAID 0/1/5/6) [PCI Express 3.0(x8)]		○	—	—	—		
N8103-178	RAID Controller (2GB, RAID 0/1/5/6) [PCI Express 3.0(x8)]		○	—	—	—		
N8103-179	RAID Controller (2GB, RAID 0/1/5/6) [PCI EXPRESS 3.0(x8)]		—	—	○	○	Dedicated to connect with external devices. Flash Backup Unit is factory installed	
N8103-142	SAS Controller [PCI Express 2.0(x8)]		—	—	○	○	Dedicated to connect with external devices.	
N8190-159	Fibre Channel Controller (8Gbps/Optical) [PCI Express 2.0(x8)]		—	—	○	○	For connecting with external Fibre Channel device	
N8190-160	Fibre Channel Controller(2ch) (8Gbps/Optical) [PCI Express 2.0(x8)]		—	—	○	○	For connecting with external Fibre Channel device	
N8190-157 A	Fibre Channel Controller (16Gbps/Optical) [PCI Express 3.0(x8)]		—	—	○	○	For connecting with external Fibre Channel device	
N8190-158 A	Fibre Channel Controller(2ch) (16Gbps/Optical) [PCI Express 3.0(x8)]		—	—	○	○	For connecting with external Fibre Channel device	
N8104-154	1000BASE-T LOM card (4ch) [PCI Express 2.0(x4)]		—	○	—	—	For additional LAN port Card type: PCI Express 2.0 (x8)	
N8104-150	1000BASE-T Adapter (1ch) [PCI Express 2.0(x1)]		—	—	○	○	For additional LAN port. Card type: PCI Express 2.0 (x4)	
N8104-151	1000BASE-T Adapter (2ch) [PCI Express 2.0(x1)]		—	—	○	○	For additional LAN port. Card type: PCI Express 2.0 (x4)	

(2/2)

Model	Product name	Slot number	#1A	#1B	#1C	#1D	Remarks	
		PCI standard	PCIe 3.0					
		PCI slot performance *1	x8 lane		X16 lane			
		PCI card type *2	x8 socket		X16 socket			
		Transfer bandwidth (per lane) *1	8Gb/s					
		Slot size	For RAID Controller	For LOM card	Full height	Low profile		
		Available card size			220mm max.			
N8104-145	1000BASE-T Adapter (2ch) [PCI Express 2.0(x4)]		—	—	○	○	For additional LAN port	
N8104-152	1000BASE-T Adapter (4ch) [PCI Express 2.0(x4)]		—	—	○	○	For additional LAN port. A LAN cable with modular cover cannot be used.	
N8104-155 *5	10GBASE-T LOM card (2ch) [PCI Express 3.0(x8)]		—	○	—	—	For additional LAN port	Up to 3 cards in total can be installed.*4 Up to 2 units can be installed For WS2008 (x86).
N8104-153	10GBASE-T Adapter (2ch) [PCI Express 2.0(x8)]		—	—	○	○	For additional LAN port	
N8104-157	10GBASE-T Adapter (2ch) [PCI Express 3.0(x4)		—	—	○	○	For additional LAN port	
N8104-156	10GBASE-SFP+(2ch)+ 1000BASE-T(2ch) LOM card [PCI Express 3.0(x8)]		—	○	—	—	For additional LAN port. Prepare SFP+ module N8104-129 if needed.	
N8104-149	10GBASE Adapter (SFP+/2ch) [PCI Express 2.0(x8)]		—	—	○	○	For additional LAN port. Prepare SFP+ module N8104-129 if needed.	
N8104-148	10GBASE Adapter (SFP+/2ch) [PCI Express 2.0(x8)]		—	—	○	○	For additional LAN port. Prepare SFP+ module N8104-129 if needed.	
N8104-146	InfiniBand Adapter (1ch) (FDR/Optical) [PCI Express 3.0(x8)]		—	—	○	○	For Infiniband connection.	Cannot be used together with each other.
N8104-147	InfiniBand Adapter (2ch) (FDR/Optical) [PCI Express 3.0(x8)]		—	—	○	○	For Infiniband connection.	
N8118-01	PCI SSD Adapter [PCI Express 2.0(x4)]		—	—	○	○	SSD to be mounted to PCI slot	
N8117-01A	Additional RS-232C connector *3		—	—	○	○	For additional serial port B (RS-232C) Only one unit can be mounted at the maximum.	

○: Can be mounted, –: Cannot be mounted

*1   Data transfer rate of PCI slot = Transfer bandwidth × Number of lanes
     <Example> x8 lane = 64 Gbps (one-way)
*2   Connector size. Cards exceeding the number of sockets cannot be connected.
     <Example> x4 socket can connect with x1 and x4 cards, but not x8 card.
*3   Use RS-232C cable (B).
*4   Performance of LAN depends on the application and memory capacity. If you want to mount three or more 10G LAN cards, a sufficient verification
     under your system environment is needed.
*5   Change the "Above 4G decoding" setting to [Disabled] to use the PXE Boot function if you set Boot Mode to [Legacy].

・ For details about the functions of each card, see "Technical Guide".
・ The description in brackets [ ] of the product name refers to the maximum operating performance.
・ The system operates in the lower performance when it differs between the PCI slot and PCI board.

1.11.3 Installation

Install a PCI card to the riser 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) which respective riser card supports and the type of PCI card to be installed. • To install an FBU, see *Chapter 2 (1.9 Flash Backup Unit for RAID Controller)*.

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

2. Remove the two screws securing the PCI riser card. Hold the both ends of the PCI riser card and lift it off.
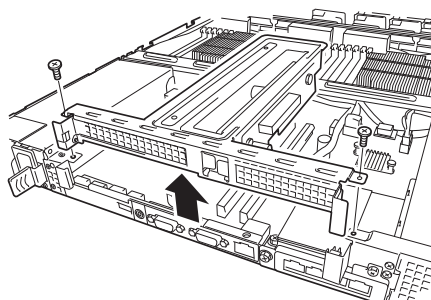
3. Confirm the installation slot with the reference to the table on *1.11.2 Supported PCI cards and available slots*.

4. Remove one screw from the PCI riser card and remove the blank cover.

PCIe #1D
Low profile side

PCIe #1C
Full Height side
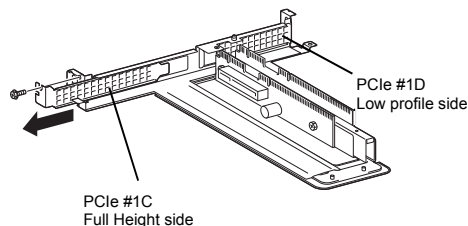
Note	Keep the removed blank cover for future use.

5. Install a PCI card to the PCI riser card. Position the terminal part of the PCI card to the PCI riser card slot and insert it.
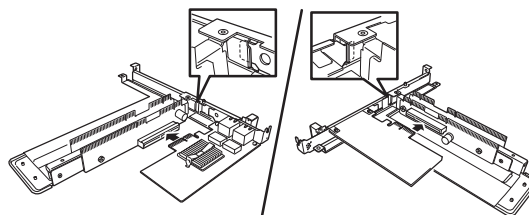
Important	Do not touch the terminal part of riser card or PCI card and the signal pins of electric parts installed on the board. Installing boards with dirt or oil can cause malfunction.

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

6. Secure the PCI card with the screw removed in step 4.

PCIe #1D Low Profile side   PCIe #1C Full Height side
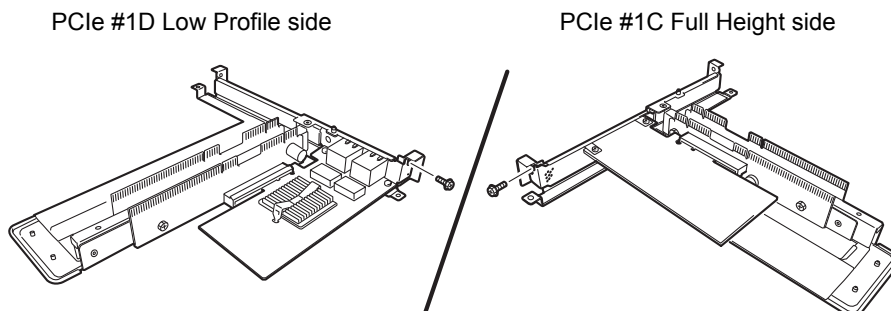
Tips	To connect a PCI card to the connector on motherboard with cable, connect a cable to PCI card before installing PCI riser card.

7. Connect the PCI riser card to the slot on motherboard and secure the card with two screws removed in step 2.
    Position the terminal part of the PCI riser card to the slot on the motherboard and insert it.
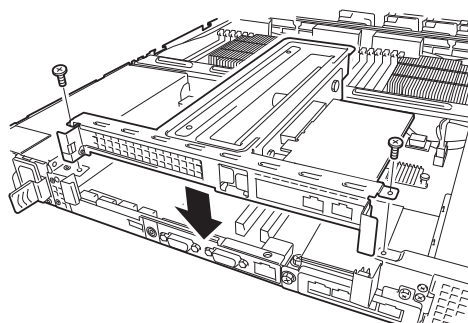
8. Continue to install or remove internal options, mount and connect the server, and turn it on.

9. Make sure that no error messages are displayed on POST screen.
    For details on POST error messages, see *Chapter 3 (1. POST Error Message)* in "*Maintenance Guide*".

10. Run the configuration utility of the card to set up the board as needed.
    For details, see the manual that comes with the card. **If a PCI card including RAID controller and LAN adapter which connects to any bootable device is added, the boot priority might be changed to the default setting**. In that case, configure the boot priority in **Boot** menu of BIOS Setup Utility. For details, see *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*".

1.11.4   **Removal**

To remove a PCI card, reverse the installation procedure.

Run SETUP and change boot order in **Boot** menu as needed. See *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*" for how to specify it.

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

1.11.5   Installing RAID controller

This section describes how to install an optional RAID controller to the slot for RAID controller.

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

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

Important	• **Avoid static electricity to work with the procedure below. For details, see** *Chapter 1 (1.8 Anti-static Measures) in Safety Precautions and Regulatory Notices.* • **Do not change the mode to hibernate while building a RAID system.**

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

Take the following procedure to install RAID controller (N8103-176/177/178).

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

2. Remove the two screws and remove the PCI riser card.
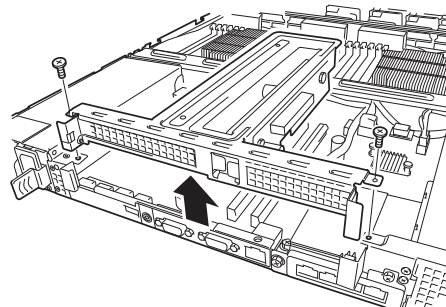
3. Remove the two screws from RAID controller, and remove the PCI bracket.
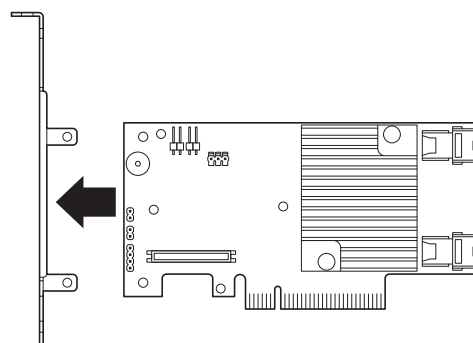
4. Remove the two screws from server chassis, and remove the RAID controller bracket.
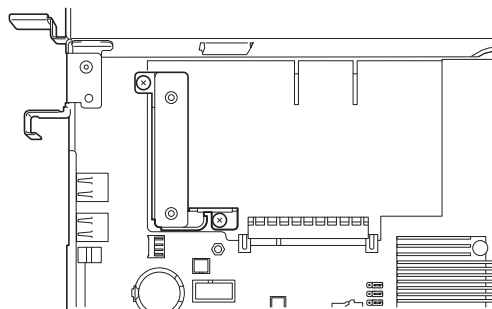
5. Attach the RAID controller bracket to the RAID controller with two screws removed in step 3.

Ports 4-7

Ports 0-3
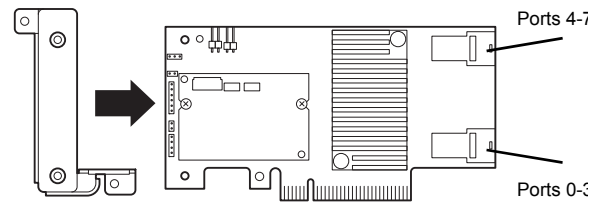
6. Insert the RAID controller slightly into the dedicated slot while tilting the card.
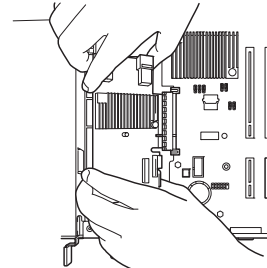
7. Gently place the RAID controller on bottom plate of chassis so that it becomes horizontal to the motherboard.
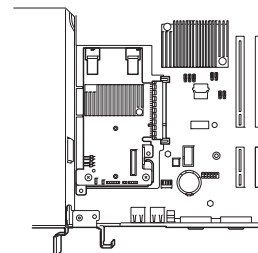
8. Insert the RAID controller into the slot while keeping horizontal state.
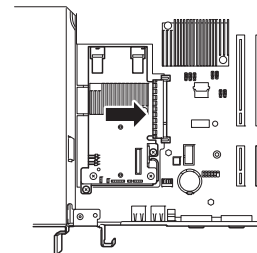
9. Secure the RAID controller bracket with two screws removed in step 4.

10. Disconnect SAS/SATA cable from SATA connector on motherboard.

11. Perform the following according to the number of hard disk drive connected.

– Four or less hard disk drives are installed:
  Connect SAS/SATA cable removed in step 10 to connector (Ports 0-3) on RAID controller.

– Five or more hard disk drives are installed:
  Connect SAS/SATA cable removed in Step 10 to connector (Ports 0-3) on RAID controller.

  Connect SAS/SATA cable provided with the server to connector (Ports 4-7) on RAID controller.

  Remove one screw from server chassis, and remove battery tray for RAID controller.

  Connect another end of SAS/SATA cable that has been connected to connector (Ports 4-7) on RAID controller, to the connector on backplane.

  Secure the battery tray for RAID controller with one screw.

12. Continue to install or remove internal options, mount and connect the server, and turn it on.

(2)   Using optional RAID controller (N8103-179)

See *Chapter 2 (1.9.4 Installing FBU)*.

1.12 Optical Disk Drive

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

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

Optical disk drive bay
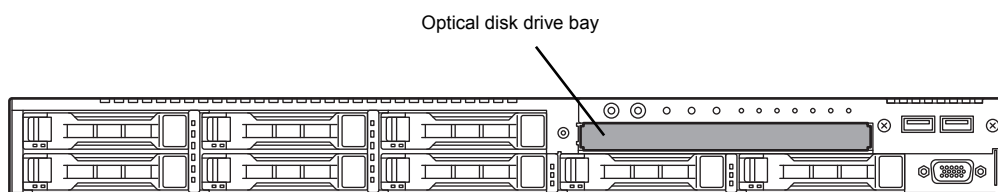
1.12.1 Installation

Install an optical disk drive in the following procedure.

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

2. Remove one screw from the bracket, and remove the bracket.
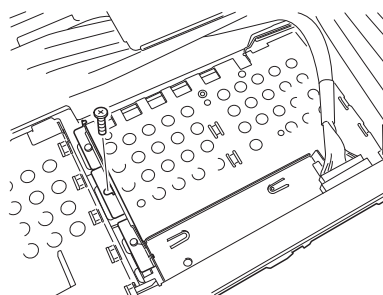
3. Remove the dummy cover.
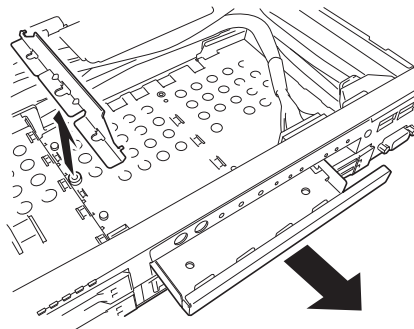
Note   Keep the removed dummy cover for future use.

4. Insert the optical disk drive.
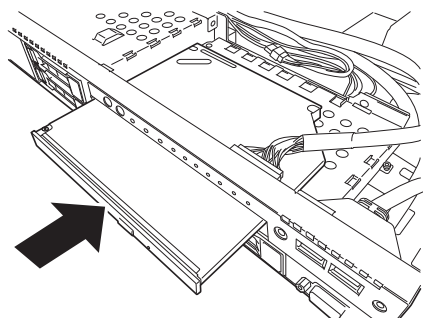
5. Put the optical disk drive on the tray.
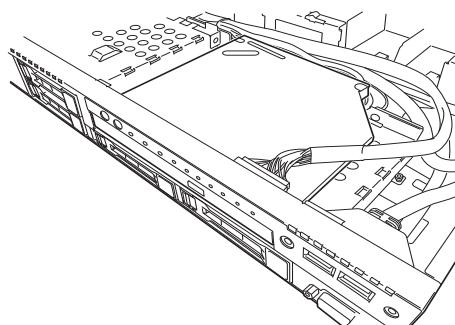
6. Secure the bracket to optical disk drive with one screw removed in step 2.

Screw
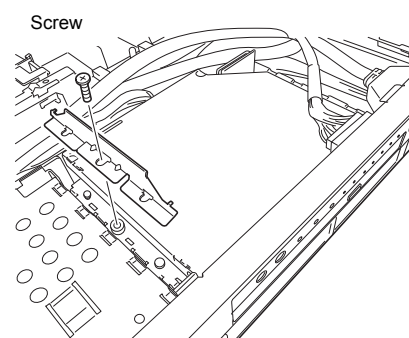
7. Connect a cable to the optical disk drive.
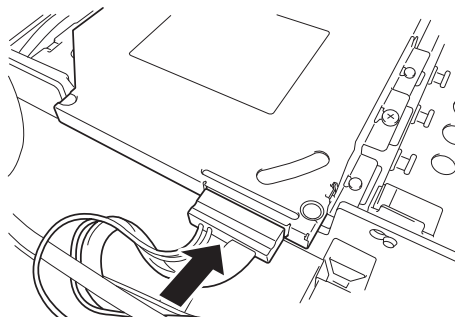
1.12.2   Removal

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

1.13 Use of Internal Hard Disk Drives in the RAID System

This section describes how to use the internal hard disk drives in the RAID system.

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

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

1.13.1 Connecting cables

See the figures below for how to connect cables.

Using optional RAID controller (1 to 8 hard disk drives)
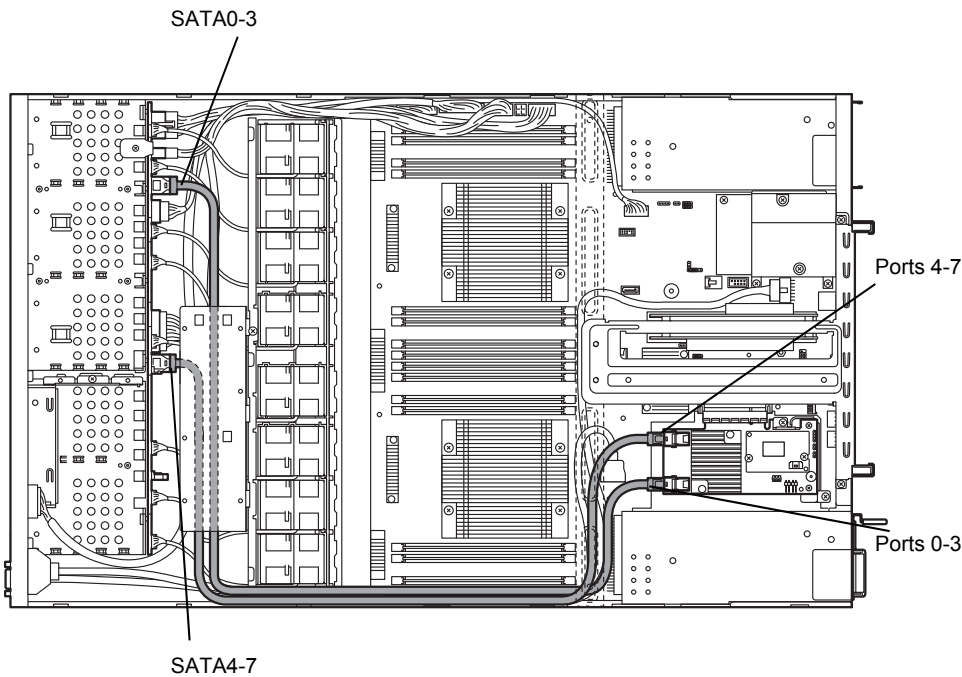
Optional RAID Controller	Backplane	Hard Disk Drive
Ports 0-3	SATA 0-3	SLOT 0
		SLOT 1
		SLOT 2
		SLOT 3
Ports 4-7	SATA 4-7	SLOT 4
		SLOT 5
		SLOT 6
		SLOT 7

1.13.2   Notes on building RAID system

Note the following points when building a RAID system.

- The number of hard disk drives required varies in each RAID level.
- If the optional RAID controller N8103-176 is used, the RAID system cannot be built in RAID5/RAID6/RAID50/RAID60.

RAID level	The minimum number of hard disk drives	
	N8103-176	N8103-177/178
RAID 0	1	1
RAID 1	2	2
RAID 5		3
RAID 6		3
RAID 10	4	4
RAID 50		6
RAID 60		6

- In the RAID system, all the hard disk drives in an array group must have the same capacity, interface type, and rotational speed.
- EXPRESSBUILDER helps you to install the OS to a RAID array easily.
- If you want to install the OS manually, use RAID Configuration Utility at POST (Ctrl-R or H). For details, see *Chapter 2 (4. RAID System Configuration)* in "*Maintenance Guide*" or the manual provided with the optional RAID controller (N8103-176/177/178).

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

1.14 **Installing Top Cover**

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

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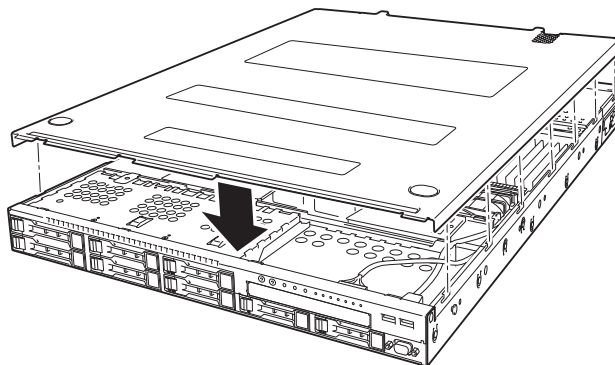
2. Slide Top Cover toward the front of the server.
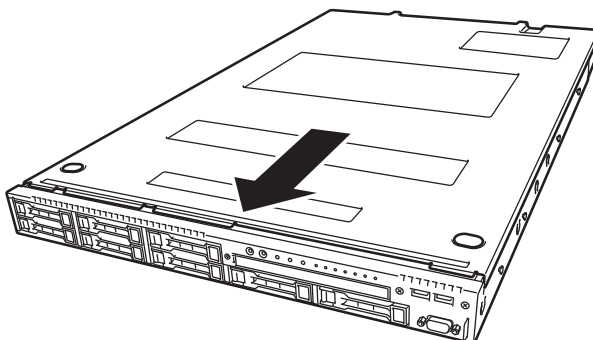
3. Tighten Cap Screw on rear of the server.

1.15 Hard Disk Drive

Bays for hard disk drives are provided at the front of the server.

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

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

Note the following precautions to install hard disk drives.

- For onboard connection, hard disk drives having different capacities, types, or rotational speeds cannot be installed together.
- In the RAID system, all the hard disk drives in an array group must have the same capacity, type, and rotational speed.
- If using hard disk drives in a RAID system, jumper settings or a change of cables may be required.

Bays can contain up to eight hard disk drives.

Unique slot numbers have been assigned to each slot.
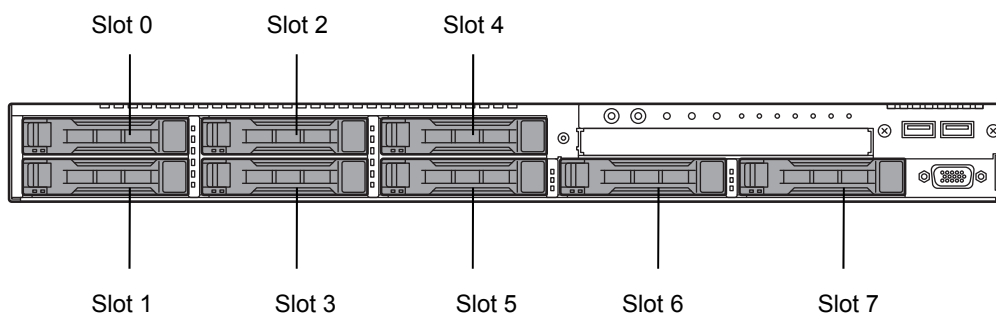
1.15.1 **Installation**

Install a hard disk drive by using the following procedure.

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

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

2. Locate the slot where you install the hard disk drive.
   The server has eight slots. Install hard disk drives in ascending order of slot number.

3. Remove the dummy tray.
   Dummy trays are installed in every slot as standard.
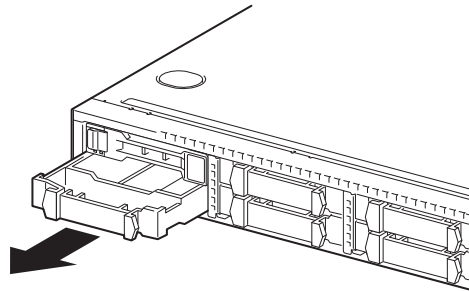
Note	Keep the removed dummy trays for future use.

4. Unlock the handle of the tray.
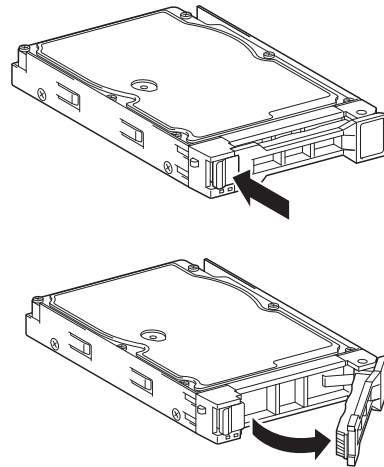
5. Hold the tray firmly and insert it into the slot.
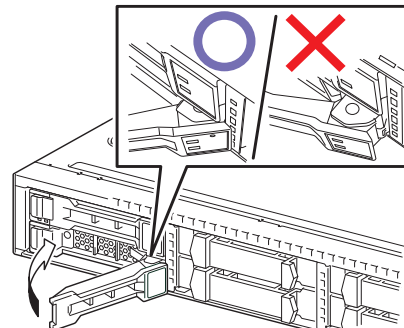
Note	• Push it all the way until the handle's lock touches the frame. • Hold the tray firmly with both hands.

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

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

7. Run BIOS Setup Utility, and then specify the boot order from **Boot** menu.
    For details, see *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*"

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

1.15.2 **Removal**

To remove hard disk drive, reverse the installation procedure.

If you transfer or dispose of the removed hard disk drive, see *Chapter 1 (1.5 Transfer, movement, and disposal) in "Safety Precautions and Regulatory Notices"* to erase data.

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

Note	• If you remove a hard disk drive due to a failure, check the slot with its DISK LED 2 lit in amber.

DISK LED 1   DISK LED 2
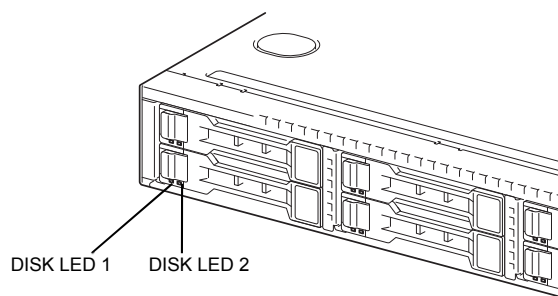
• Do not hold handle to pull the drive out. Doing so may damage the handle.

Run the BIOS Setup Utility, and then specify the boot order from **Boot** menu.
For details, see *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*".

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

1.15.3   Replacing a hard disk drive in the RAID system (Auto Rebuild)

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

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

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

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

Observe the following precautions whenever executing the auto rebuild.

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

1.16 **Power Supply Unit**

This server can contain two power supply units. The server provides a redundant power configuration that ensures continued operation of the system in the unlikely event one of the power supply units fails.

Tips	AC power supply unit has a cable tie to prevent AC cable from slipping out.

1.16.1   **Cold redundant feature**

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

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

Cold redundant feature can be used under the following conditions:

- Two power supply units must be installed for redundant configuration.
- See *Chapter 2 (1. System BIOS) in "Maintenance Guide"*, change parameters as shown below, save the settings and exit from SETUP.
  Server → **Power Control Configuration** → **Cold Redundant Mode** → **Enabled**
  Run SETUP again, and check if the status of **Cold Redundant Mode** shows **Enabled** in **Server** menu.

1.16.2   Installation

Follow the steps below to install a power supply unit:

1. See steps 1 to 4 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Remove the blank cover.

Slot for standard
power supply unit   REAR   Slot for additional
                                                                                     power supply unit
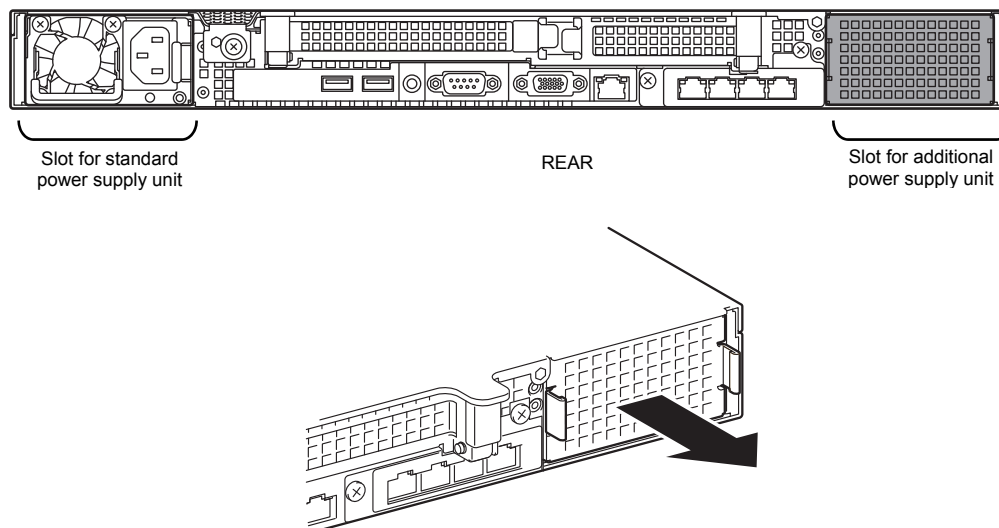
Note	Keep the removed blank cover for future use.

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

4. Connect the power cords.

Power supply unit
#1

Power supply unit
#2

Power cord for power
supply unit 2
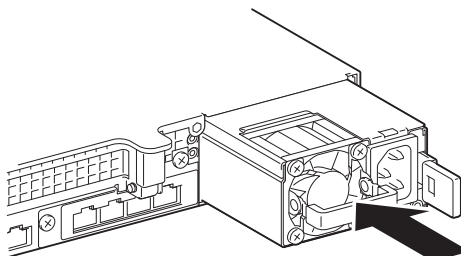
Power cord for power
supply unit 1
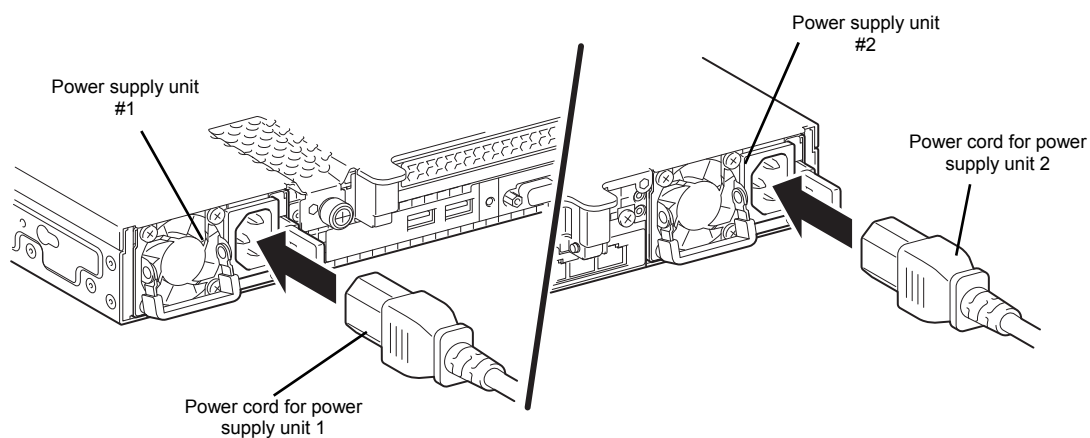
AC POWER LED blinks green when the power cord is connected to either of power supply units and the other power supply unit's AC POWER LED goes on amber.

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

AC POWER LED

Power supply unit #1   Power supply unit #2
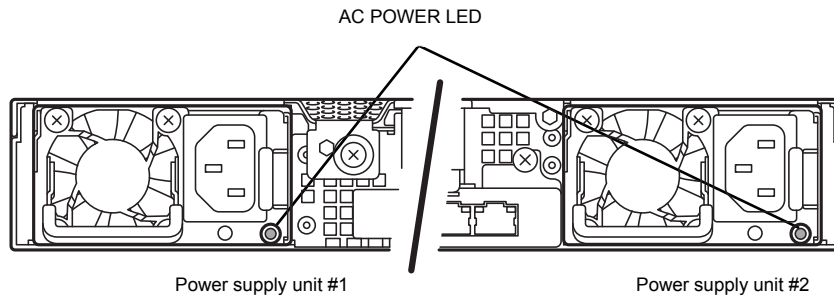
5. Power on the server.

AC POWER LEDs go on green.

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

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

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

1.16.3   Replacing a failed power supply unit

Replace only when the power supply unit fails.

To remove power supply unit, reverse the installation procedure.

⚠ CAUTION

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

- **Pay attention to electric hazard.**

Important
- **Do not remove a power supply unit operating normally.**
- **To maintain the cooling effect in the server, be sure to install the blank cover in the vacant slot.**

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

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

1.17 Installing Front Bezel

When installing Front Bezel, engage the left end of front bezel with chassis. Then, engage the right end of front bezel with chassis.
After installing Front Bezel, lock it with Bezel Lock Key.

1. Install the front bezel as shown in figure below.
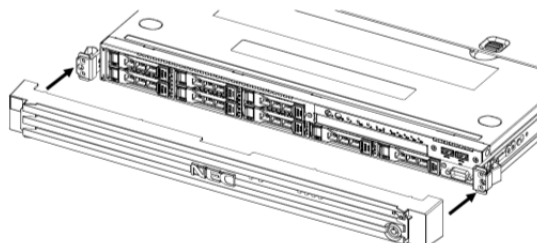
2. Lock the front bezel with the security lock key.

    (When it isn't locked by the security lock key, the front bezel isn't fixed certainly.)

Unlocked   Locked
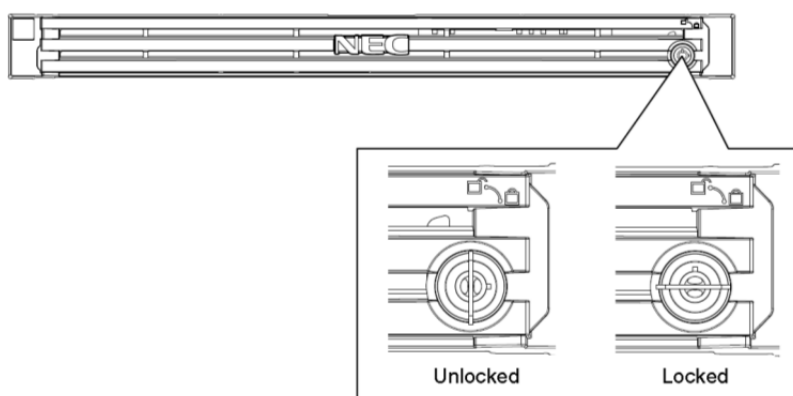
Important	Be careful not to press the POWER Switch.

2. Installation and Connection

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

2.1   Installation

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

2.1.1   Installing Rack

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

⚠ WARNING

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

- **Use only in the specified environment.**
- **Do not connect the ground wire to a gas pipe.**

⚠ CAUTION

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

- **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 the server in the environment where corrosive gas is generated.**

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

- Narrow space from which devices cannot be pulled out from the rack completely

- Place that cannot bear the total weights of the rack and devices mounted on the rack

- Place where stabilizers cannot be installed or where the rack can be installed only after the practice of proper earthquake-resistant construction

- Place of uneven or slanting floor

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

- Place where intense vibration may be generated

- Place where corrosive gases (sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, ozone, etc) exist
  Place where the air (or dust) includes components accelerating corrosion (ex. sulfur, sodium chloride) or conductive metals

- Place where chemicals may be accidentally sprayed over

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

- Place where some objects may be fallen on the rack

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

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

- Place near equipment that generates power noise (e.g., contact spark at power-on/power-off of commercial power supply through a relay).

- Environment where operation of the server is not guaranteed

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

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

⚠ **WARNING**

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

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

⚠ **CAUTION**

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

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

Important   Temperature increases and airflow in the rack

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

Preparation

- Checking rails
- Installing inner and outer rails

Checking rails

Make sure the orientation of inner and outer rails by viewing labels on each rail.

Inner rail

Outer rail

Label
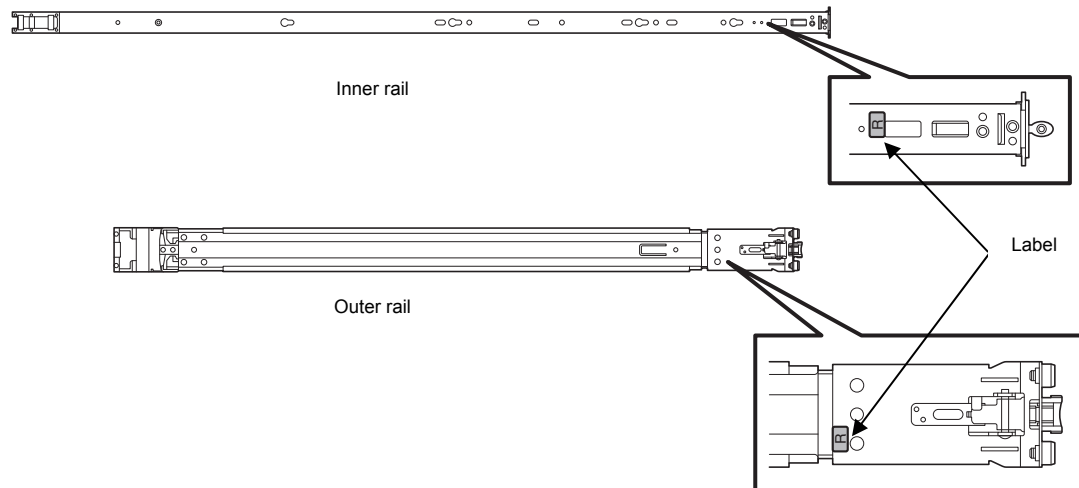
Installing inner rails

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

2. Align the locks and holes, and insert the inner rails until it clicks.
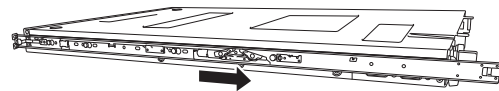
Installing outer rails

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

2. Fit the square-shaped protrusions of outer rail to the square holes of a 19-inch rack. Make sure that it makes a clicking sound indicating that it is locked.
The image on the right shows the front left side of the rack. Install to the rear left side and front and rear right sides following the same procedure.
Make sure that the rail is installed at the same height as the other rail already installed.
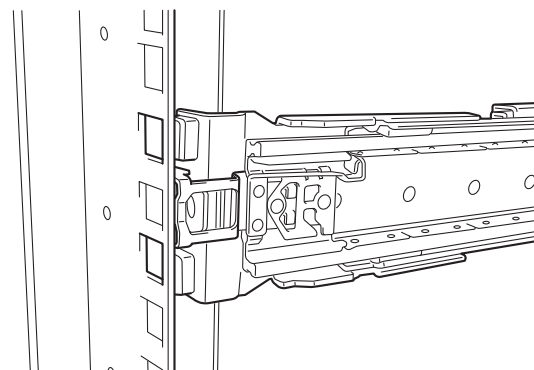
Important	**Confirm that the rails are securely locked so that they will not fall off.**
Tips	Although the rail may be somewhat unsteady, it is not defective.

Installing/Removing the Server

⚠ **CAUTION**

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

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

(1) Installation

Mount the server to a rack in the following procedure.

Important   Always install the server with two or more persons.

1. Pull the slide rail from the outer rail until the slide rail is locked.
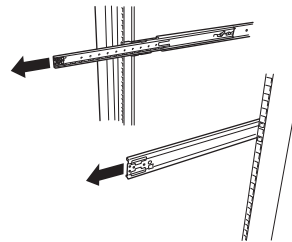
Note   Make sure that locking mechanism work normally.

Locked state   Locking mechanism
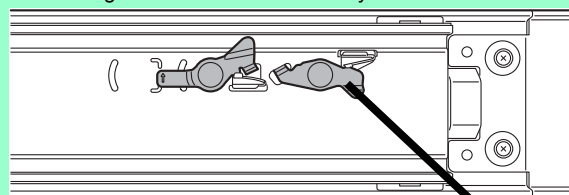
2. With two or more persons, firmly hold the server and mount it to the rack.
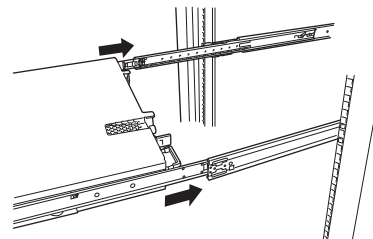
3. When the server is pushed into the rack and
    is locked, push the server to the end while
    pulling the rail stopper (blue) on both sides
    of the server.

Rail stopper
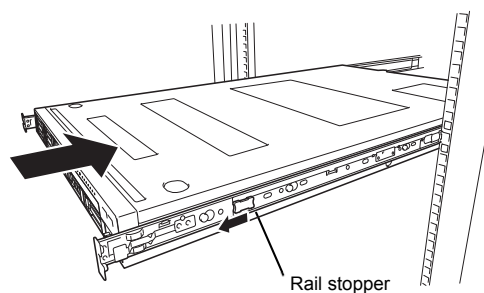
4. Push the server until its lock on front panel
    clicks.
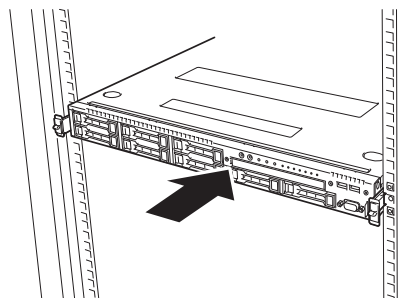
(2)   Removal procedure

Remove the server from the rack in the following procedure.

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

1. Make sure that the server is turned off and then disconnect the power cord or all interface cables from
    the server.

2. Release the key lock.

3. Firmly hold the left side of front
    bezel (when viewed from the front
    side), and pull the right side of it
    forward about 10 cm. Confirm that
    left side of front bezel is unlocked,
    and then pull the left side forward to
    remove the front bezel from
    chassis.

① Hold by hand

③ Pull

② Rotate about 10 degree

① Hook   ②   ③
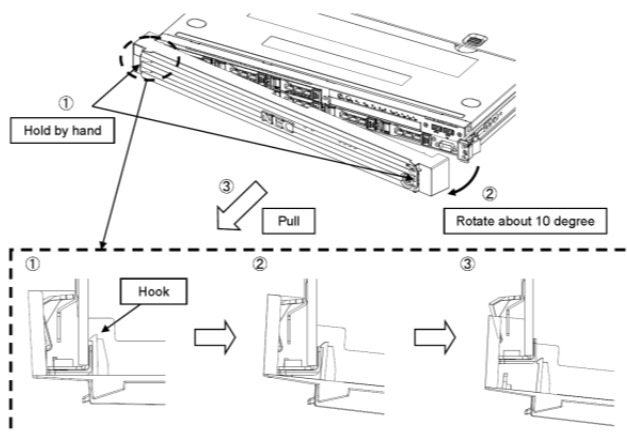
4. Slowly pull the server out while
    pressing the buttons located on
    both sides of the front of the server.

Press the button
to unlock
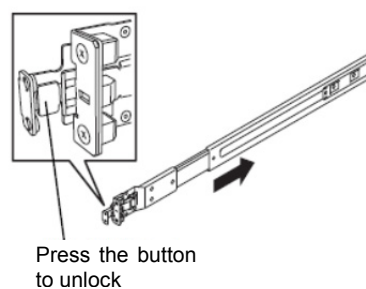
5. The server will come to a stop
    halfway. Press and hold Rail
    Stoppers on the rail and pull the
    server out of the rack.

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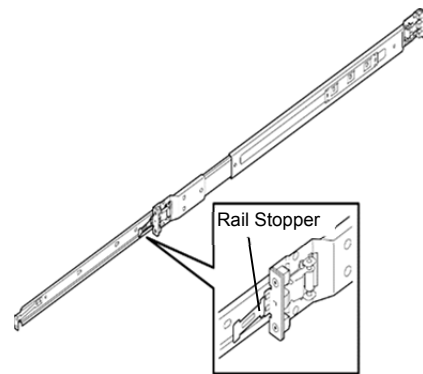
Important	Be careful not to get your fingers caught in the rails or lever.

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

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

(3) Removing Outer Rail

Remove outer rails from the rack in the following procedure.

1. See Chapter 2 (*2.1.2 Installing the server to the rack or removing it from the rack, (2) Removal procedure*) to remove the server from the rack.

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

Unlock lever   Locking mechanism
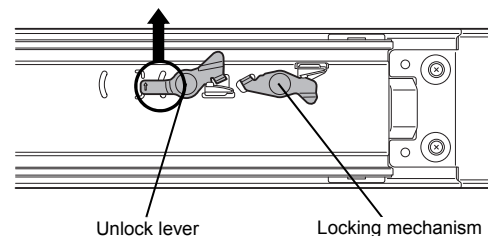
3. While pressing the lever on outer rail, push
    the outer rail toward inside of the rack, then
    remove it.
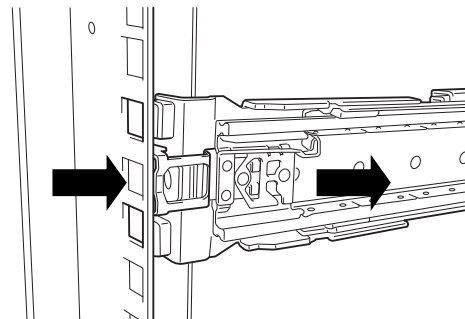
2.2 Connection

Connect peripheral devices to the server.

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

⚠ WARNING

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

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

⚠ CAUTION

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

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

USB device

FRONT

Display unit *2

Display unit *2

Finally, connect the provided
power cord to an outlet. *1

For connecting with UPS, see
the next section.

Hub, switching hub, etc.

10GBASE-SFP/
10GBASE-T/
1000BASE-T/
100BASE-TX/
10BASE-T

Data LAN ports

1   2   3   4

REAR

M   Management
     LAN port

USB device   Device with serial interface   Hub, switching hub, etc.
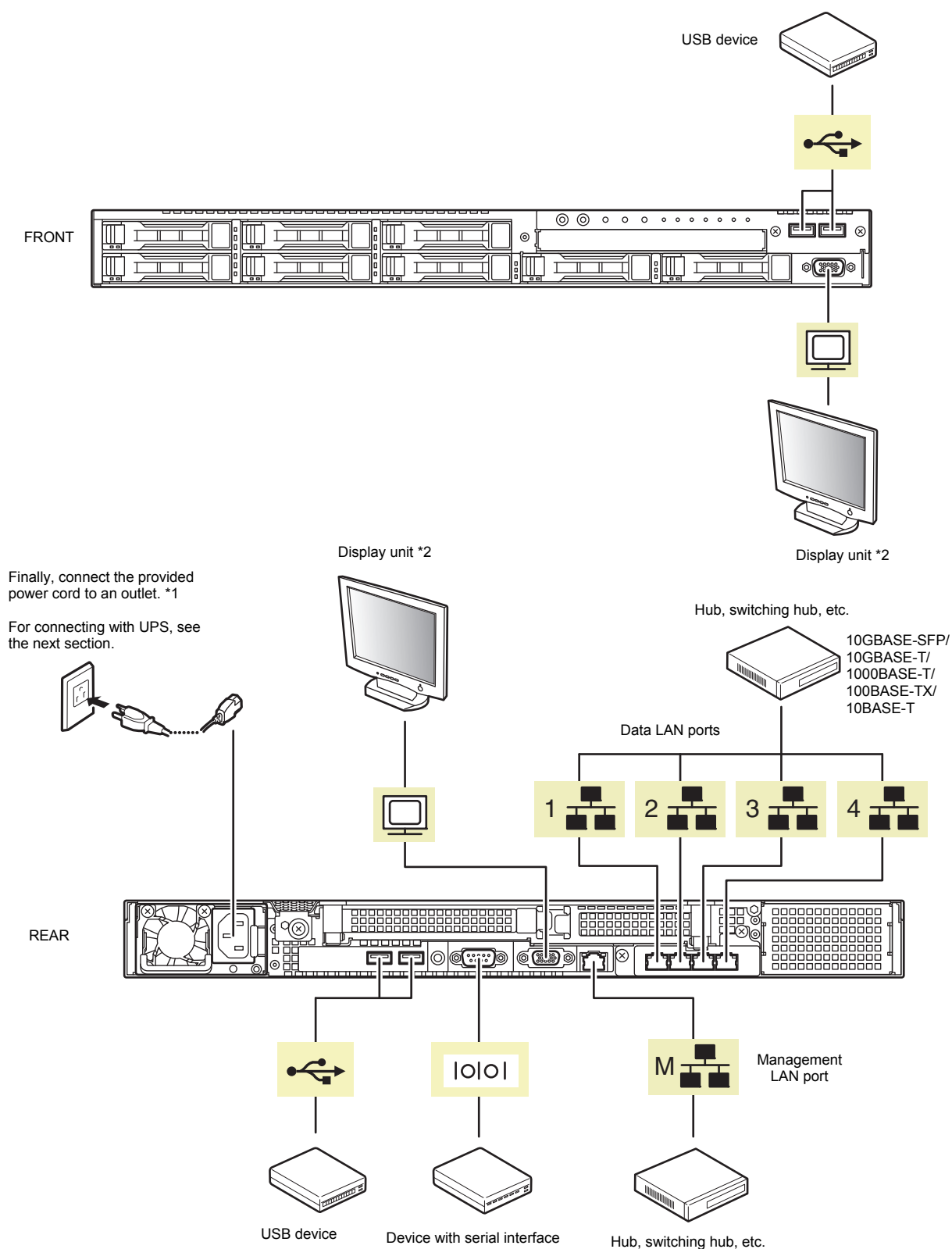
*1   Connect the power cord to a circuit breaker of up to 15 A.
*2   Either one can connect with a display unit.

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

Note	Use the board that has been applied for a permission from the accreditation organization when connecting to a line..

Note the following precautions to connect cables.

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

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

To connect the power cord of the server to a UPS, use the connector output on the rear of the UPS. For details, refer to the manual supplied with the UPS.
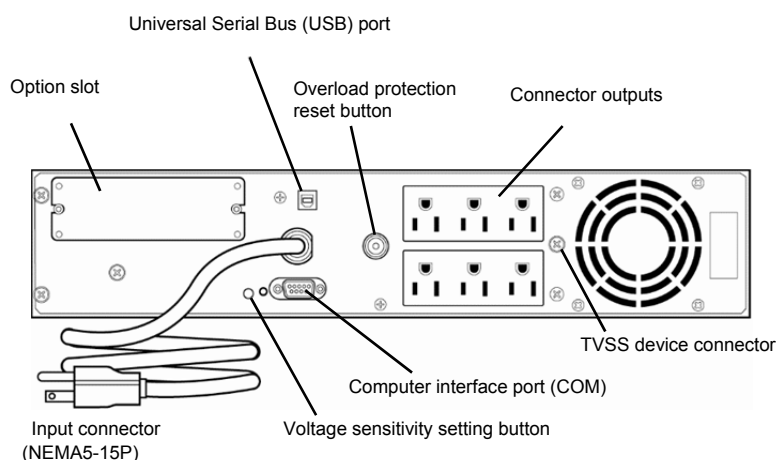
When the power cord is connected to a UPS, change the BIOS settings in order to link the server with the power supply from the UPS.

To change the settings, select **Server** and then **AC-LINK** in BIOS Setup Utility, and change the displayed parameters. Select **Power On** to perform automatic operations by using the UPS. For details, see *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*".

NEC Express5800 Series
Express5800/R120g-1E

3

Setup

This chapter describes how to set up the server.

1. **Turning on the Server**
   Describes how to turn on the server and describes Power-On Self-Test (POST) process.

2. **BIOS Setup Utility (SETUP)**
   Describes how to run BIOS Setup Utility (SETUP).

3. **EXPRESSSCOPE Engine 3**
   Describes how to use EXPRESSSCOPE Engine 3.

4. **EXPRESSBUILDER**
   Describes how to use EXPRESSBUILDER.

5. **Installing Software**
   Describes how to install Windows and bundled software.

6. **Turning off the Server**
   Describes how to turn off the server.

1. Turning on the Server

Turn on the server by using the following procedure.

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

1. Turn on the peripheral devices and display unit.

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

2. Remove Front Bezel.

3. If STATUS LEDs are lighting green or amber, wait until they go off.

4. Press POWER Switch at the front of the server.
   POWER LED is turned on green and after a while, logo appears on the display.

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

POWER Switch
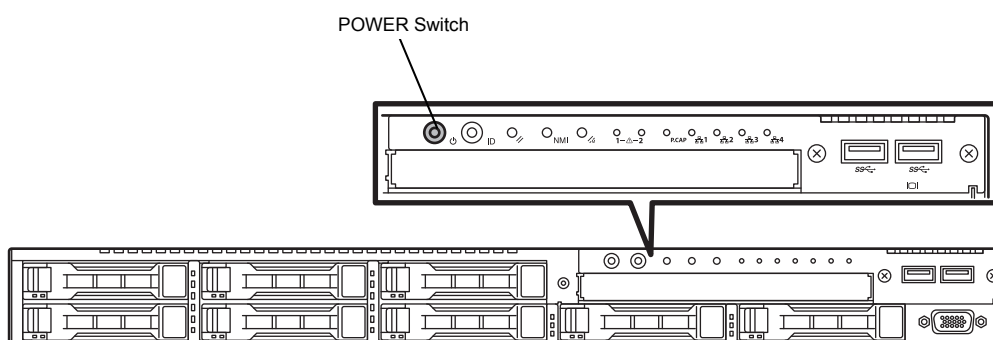
While logo is being displayed, the self-diagnostic program (POST) runs and diagnoses the hardware. For details, see *Chapter 3 (1.1 POST)*.

1.1   POST

Power-On Self-Test (POST) is a self-diagnostic program stored in the server as standard. POST automatically runs immediately after the server is turned on and checks the motherboard, memory, and processor (CPU). POST also displays the start-up messages of different utilities during the operation.

<u>Usually, you do not need to check the result of POST.</u> However, check messages displayed at POST in the following cases.

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

1.1.1   POST sequence

Explains how POST runs in order.

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

NEC

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

2. If **Enabled** is specified for **Password On Boot** in **Security** menu of SETUP, you will be prompted to enter password after the logo is displayed.
   If you enter the incorrect password three times consecutively, POST stops and you can no longer proceed. Turn off the server and restart.

Important	**Do not set a password before OS is installed.**

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

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

4. After a while, the following message appears on the screen. The description of message is subject to the hardware configuration.

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

    You can call the functions below upon completion of POST by pressing the following function keys.

    <F2> key: Run BIOS Setup Utility (SETUP). See *Chapter 3 (2. BIOS Setup Utility (SETUP))* for details*.*

    <F3> key: Run EXPRESSBUILDER from Internal Flash Memory.
    See *Chapter 3 (4. EXPRESSBUILDER)* for details.

Note	If bootable CD/DVD is inserted into optical disk drive, the system starts from CD/DVD even if <F3> key is pressed.

    <F4> key: Run Offline Tools. See *Chapter 1 Maintenance (9. Offline Tools) in "Maintenance Guide"* for details.

    <F12> key: Boot from network.

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

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

    Example: If an optional RAID controller is installed

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

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

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

    Depending on the hardware configuration (optional boards), the message "Press Any Key" might appear to prompt a key entry. Continue to operate after checking the manual of the optional board.

6. The OS starts when POST is completed.

1.1.2   POST error messages

When POST detects an error, an error message appears on the screen or a beep code sounds. For descriptions of error messages, causes, and countermeasures, see *Chapter 3 (1. POST Error Message) in "Maintenance Guide"*.

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

2.   **BIOS Setup Utility (SETUP)**

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

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

2.1   **Overview**

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

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

2.2   **Starting SETUP**

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

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

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

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

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

Password

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

```
Enter password[                    ]
```

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

Saving changes

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

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

Tips	• If you want to restore the setting to default values, select **Save & Exit** and then **Load Setup Defaults**.
	• Some default values are different from the factory settings.
	• You cannot restore the default value in the following submenus in **Advanced** menu:
	– **iSCSI Configuration** submenu
	– **UEFI Driver Configuration** submenu

2.3   **Usage of SETUP**

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

Indicates the current menu

Indicates the menu
has submenus.

Hel

Items

Parameters (highlighted when chosen*)
*: Items that cannot be specified are grayed out.
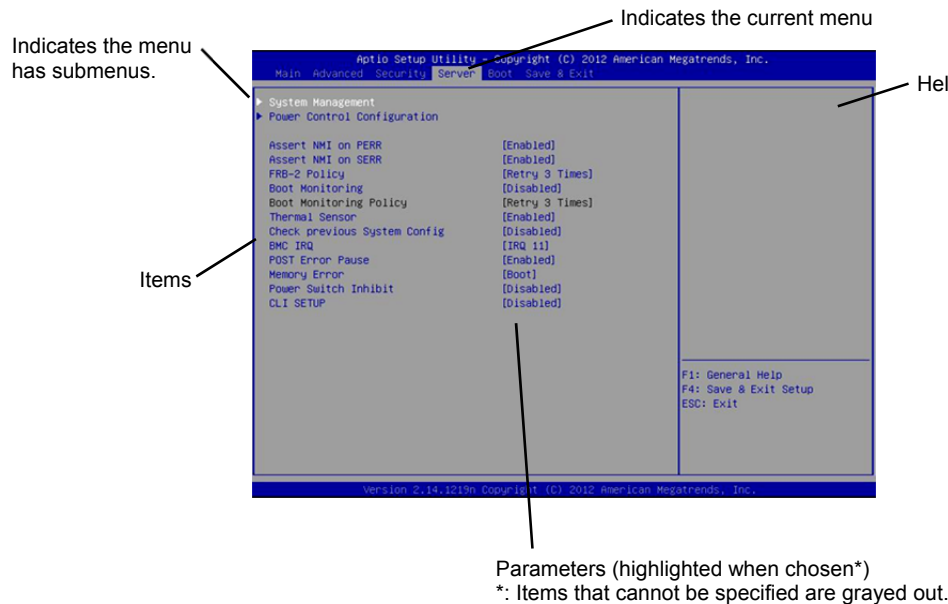
☐ Cursor keys (<↑>, <↓>)
Chooses an item displayed on the screen. If characters of an item are highlighted, that means the item is currently chosen.

☐ Cursor keys (<←>, <→>)
Chooses menus including **Main**, **Advanced**, **Security**, **Server**, **Boot**, and **Save & Exit**.

☐ <−> key/<+> key
Changes the value (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
Cancels pop-up window. On the submenu, pressing this key takes you to the previous screen. On the top menu, the following window is displayed. If you choose **Yes**, SETUP closes without saving the changed parameters.

```
┌─────────────────────────────────┐
│      Quit without saving?       │
├─────────────────────────────────┤
│        [Yes]        No          │
└─────────────────────────────────┘
```

☐ <F1> key
Displays help information. Press <Esc> key to go back to the original screen.

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

```
┌─────────────────────────────────┐
│       Load Previous Values?     │
├─────────────────────────────────┤
│       [Yes]        No           │
└─────────────────────────────────┘
```

□ <F3> key
Displays the following window. If you choose **Yes**, SETUP loads the default parameters. **Some default parameters are different from the factory settings.**

```
┌─────────────────────────────────┐
│        Load Setup Defaults?     │
├─────────────────────────────────┤
│       [Yes]        No           │
└─────────────────────────────────┘
```

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

□ <F4> key
Displays the following window. If you choose **Yes**, the parameters changed are saved and SETUP closes. After exiting SETUP, the server restarts automatically.

```
┌─────────────────────────────────┐
│     Save configuration and exit?│
├─────────────────────────────────┤
│       [Yes]        No           │
└─────────────────────────────────┘
```

2.4   Cases that Require Changes

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

Category	Description	To be changed	Remark
Basic	Change date and time	**Main → System Date** **Main → System Time**	Configurable on OS
	On/Off NumLock on power ON	**Boot → Bootup Numlock State → ON** or **OFF**	
	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	Add or change DIMM	**Advanced → Memory Configuration → Memory Retest → Yes**	After rebooting, **Memory Retest** changes **No** automatically.
	Use memory RAS feature	**Advanced → Memory Configuration → Memory RAS Mode → change to RAS mode**	Some of RAS features may not be used depending on DIMM configuration.
Optional board	Start the system from installed option board.	**Advanced → PCI Configuration → PCI Device Controller and Option ROM Settings → PCIXX Slot Option ROM → Enabled**	*XX* is PCI slot number of the installed option board

Boot	Set the boot mode to UEFI mode according to your OS.	**Boot → Boot Mode → UEFI**
		Select UEFI mode for the following OS.
		   – Windows Server 2012
		   – Windows Server 2012 R2
			See "*Before Starting Setup*" in *Chapter 1 (Installing Windows)* in *Installation Guide* to determine the boot mode.

	Set the boot mode to Legacy BIOS mode according to your OS.	**Boot → Boot Mode → Legacy**
		Select Legacy mode for the following OS.
		   – Windows Server 2008
		   – Windows Server 2008 R2
			See "*Before Starting Setup*" in *Chapter 1 (Installing Windows)* in *Installation Guide* to determine the boot mode.

	Change the boot order of devices	**Boot → Boot Option Priorities → Change** the boot priority	When you use EXPRESSBUILDER, set **CD/DVD** to the highest priority.
	Use remote power on feature (via modem)	**Advanced → Advanced Chipset Configuration → Wake On Ring → Enabled**	
	Use remote power on feature (via RTC alarm)	**Advanced → Advanced Chipset Configuration → Wake On RTC Alarm → Enabled**	
	Use console redirection feature	**Advanced → Serial Port Configuration → Console Redirection Settings → Change** respective setting.	In console redirection connection, if the corrupted text is displayed on terminal screen, change font type (character code) appropriate to your environment.

	Enable X2APIC feature according to your OS.	**Advanced → Processor Configuration → X2APIC → Enabled**
		Enable X2APIC for the following OS.
		   – Windows Server 2012
		   – Windows Server 2012 R2
			See "*Before Starting Setup*" in *Chapter 1 (Installing Windows)* in *Installation Guide* to select **Enabled** or **Disabled**.

	Disable X2APIC feature according to your OS.	**Advanced → Processor Configuration → X2APIC → Disabled**
		Disable X2APIC for the following OS.
		   – Windows Server 2008
		   – Windows Server 2008R2
			See "*Before Starting Setup*" in *Chapter 1 (Installing Windows)* in *Installation Guide* to select **Enabled** or **Disabled**.

Category	Description	To be changed	Remark
Security	Set a password	**Security → Administrator Password →** Enter a password (Set a password for Administrator first and then User)	There are two types of password; Administrator and User. Settings for User password is limited compared to for Administrator.
	Restrict bootup by entering password	**Security → Password on Boot → Enabled**	Can be selected when password is set.
	Executing TBOOT (Trusted Boot) by using the optional TPM kit	Install the optional TPM kit, and specify [Enabled] for the items below under the **Trusted Computing** submenu in **Security**. ・[TPM Support] ・[TPM State] ・[TXT Support]	Do not disable TPM by using the TPM management module and others under the state that [Enabled] is specified for **TXT Support** and OS is started up. That causes unavailability of changing **TPM Support** and **TXT Support**. At that time, select and perform **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 it 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**	

2.5   **BIOS setting by network**

2.5.1   **Overview**

You can backup and restore the BIOS setting via EXPRESSSCOPE Engine 3 by incorporating XPRESSSCOPE Engine 3 and BIOS.
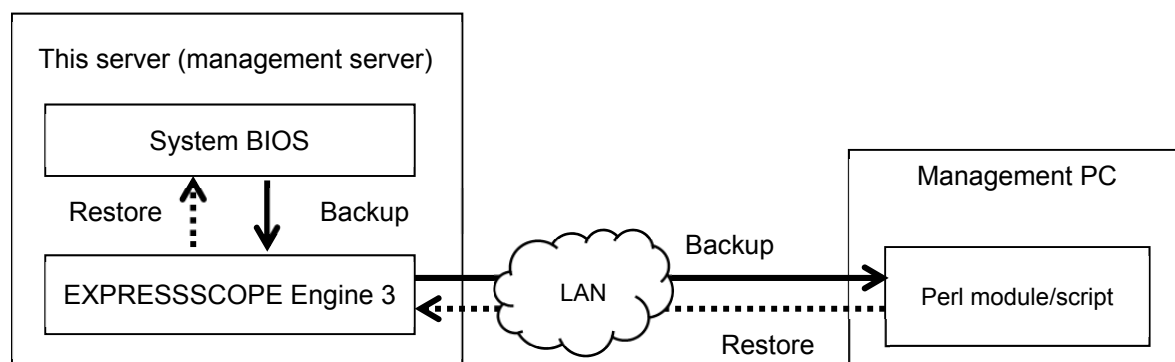
Tips	See "EXPRESSSCOPE Engine 3 Scripting Guide" for the environment required for backup and restore of the BIOS setting, Perl modules and sample scripts.

☐   Backup

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

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

・During POST

・Immediately after the completion of POST

・Immediately after turning off the power of this server

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

☐ Restore

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

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

・During POST

・Immediately after the completion of POST

・Immediately after turning off the power of this server

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

2.5.2   **Backing up the BIOS setting**

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

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

2. Execute Perl scripts.

    The following processes are executed in the sample Perl script.

    ・HTTPS (or HTTP) connected to EXPRESSSCOPE Engine 3

    ・Login to EXPRESSSCOPE Engine 3

    ・Downloading the BIOS setting file

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

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

2.5.3   **Restoring the BIOS setting**

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

1. Refer to the backed up BIOS setting file and change the "operation" attribute of the "request_id" element from "response" to "request".

Note	Save the file in the following format. ・Character code: Unicode ・Encoding: UTF-8 ・Line feed code: [CR+LF]

Tips	Do not change other attribute than "operation" of the "request_id" element. If you change any other attribute, you may not restore the file correctly.

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

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

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

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

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

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

3. Execute Perl scripts.

   The following processes are executed in the sample Perl script.

   ・HTTPS (or HTTP) connected to EXPRESSSCOPE Engine 3

   ・Login to EXPRESSSCOPE Engine 3

   ・Uploading the BIOS setting file

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

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

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

2.5.4　**Notes**

● **You can't back up or restore the following settings.**

> ➢ [Main] - [System Language]
> ➢ [Main] - [System Date]
> ➢ [Main] - [System Time]
> ➢ iSCSI Configuration sub menu
> ➢ UEFI Driver Configuration sub menu
> ➢ Booting priority of each device type ([Boot] - [CD/DVD Priorities], [Removable Priorities], [HDD Priorities], [Network Priorities])

● Display only menus (status and Revision) may not be backed up and restored

● You can't restore the backed up BIOS setting file for a different model.

● You can't restore the backed up BIOS setting file for a different BIOS version.

● A part of the BIOS setting is not reflected if the file is restored after changing the hardware configuration. Example: When you change the BIOS setting file backed up in the standard riser card configuration and restore it, you cannot restore the PCI3C Slot Option ROM setting.

● When you have restored the file after the completion of POST (after starting OS), upload the BIOS setting file and restart this server to reflect the setting to BIOS.

● It may take several minutes to download and upload the BIOS setting file. If you cannot download the file in 10 minutes or more while you use the remote KVM and remote media function of EXPRESSSCOPE Engine 3, disable these functions. Then, wait until the completion.

3.   EXPRESSSCOPE Engine 3

3.1   Overview

EXPRESSSCOPE Engine 3 provides several features by using Baseboard Management Controller (BMC).

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

Follow the steps below to use EXPRESSSCOPE Engine 3 with a web browser.

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

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

2. Press <F4> key while the message is being displayed to launch ROM Utility.

3. Choose your keyboard type on Keyboard Selection screen.

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

   ```
   Off-line TOOL MENU

    Off-line TOOL MENU
     Maintenance Utility
     Server Configuration Utility
     Exit



     These utilities are for maintenance and configuration.

     - System information is displayed, managed,
       and set in "Maintenance Utility".
     - Various configuration parameters of the server is displayed and set
       in "Server Configuration Utility".
     - Exits the Off-line TOOL and resets the system in "Exit".
   ```

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

Tips	If the web feature, remote media/KVM feature or command line interface feature is interrupted when enabling the Shared BMC LAN, wait for a while and connect with network again.
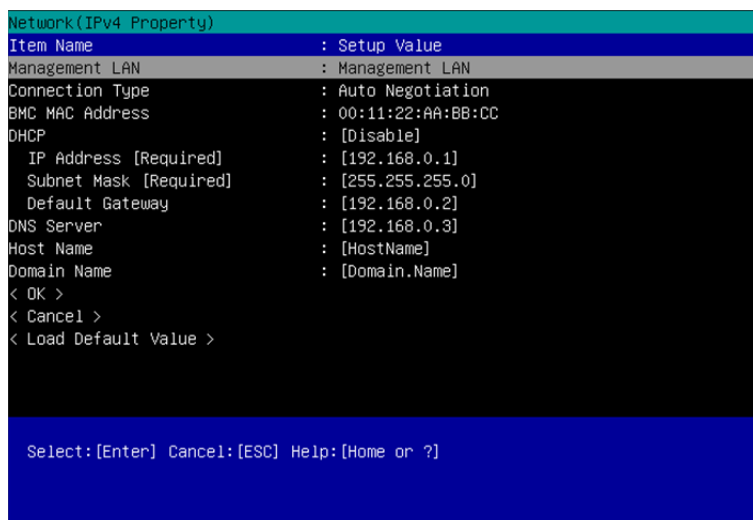
Figure at IPv4 Property

6. Connect a LAN cable to the management LAN connector. Access EXPRESSSCOPE Engine 3 by using "PC for management" according to the settings of step 5.

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 ESMPRO ServerAgentService, Universal RAID Utility, and other bundled software.
Maintenance	Diagnoses the server. To use this feature, choose **Tool menu** in Boot Selection Menu.
Manuals	Stores *User's Guide*, *Installation Guide*, *Maintenance Guide*, and other manuals.

4.2 Usage of EXPRESSBUILDER

Run EXPRESSBUILDER by the following ways:

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 after installing Windows and Starter Pack.

EXPRESSBUILDER DVD:

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

http://www.nec.com/

● Support & Downloads

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

For details, see *Chapter 2 (6. Details of EXPRESSBUILDER)* in *Maintenance Guide*.

5.   Installing Software

See the instructions below to install an OS and bundled software.

Installation Guide (Windows)

6. Turning Off the Server

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

1. Shut down the OS.

2. The server automatically turns off after the OS shuts down.
    Check if POWER LED is OFF.

3. Turn off peripheral devices.

Tips	Hibernate feature of Windows Server cannot be used. Do not enable Hibernate at Windows shutdown.

4

NEC Express5800 Series
Express5800/R120g-1E

Appendix

1. **Specifications**

2. **Interrupt Lines**

3. **Glossary**

4. **Revision Record**

1. Specifications

Code Number		N8101-				
		1029F	**1030F**	**1031F**	**1032F**	**1036F**
CPU	CPU	Intel Xeon processor				
		E5-2603 v4	E5-2620 v4	E5-2623 v4	E5-2630 v4	E5-2650 v4
	Clock speed	1.70GHz	2.10GHz	2.60GHz	2.20GHz	2.20GHz
	Number of CPUs, standard / maximum	1/2				
	Intel Smart Cache (Last Level Cache)	15MB	20MB	10MB	25MB	30MB
	Number of cores (C) / Number of threads (T) per CPU	6C/6T	8C/16T	4C/8T	10C/20T	12C/24T
Chipset		Intel C612 chipset				
Memory	Capacity, standard/maximum	None (optional) /Registered DIMM : 384 GB (24x 16 GB), Load Reduced DIMM : 1.5 TB (24x 64 GB)				
	Memory module	DDR4-2400 Registered DIMM (4/8/16/32 GB), DDR4-2400 TSV Registered DIMM (64 GB)				
	Maximum operating frequency	1866 MHz	2133 MHz			2400NHz
	Error check, correction	ECC, x4 SDDC, Memory LockStep (x8 SDDC)				
	Memory sparing	Supported				
	Memory mirroring	Supported				
Storage	Hard disk drive	Internal (standard)	–				
		Internal (maximum)	2.5-inch HDD: SATA 8 TB (8x 1 TB), SAS 14.4 TB (8x 1.8 TB), 2.5-inch SSD: SATA 6.4 TB (8x 800 GB), SAS 3.2 TB (8x 400 GB)			
		Hot swap	Supported			
	Interface / RAID level	SATA 6 Gb/s : RAID 0/1/5/6/10/50/60 (optional), SAS 12 Gb/s : RAID 0/1/5/6/10/50/60 (optional)				
	Optical disk drive	Internal or external drive (optional) *1				
	FDD	Optional: Flash FDD (1.44 MB) *2				
	Expansion bay	-				
Expansion slots	Supported slots	1x PCI Express 3.0 (x8 lane, x8 socket)(full-height, length 220 mm) 1x PCI Express 3.0 (x8 lane, x8 socket) (low-profile, length 220 mm)(Optional) 1x PCI Express 3.0 (x8 lane, x8 socket) (for RAID controller) 1x PCI Express 3.0 (x8 lane, x8 socket) (for LOM card) With optional riser card installed, can be changed to PCI Express 3.0 (x16 lane, x16 socket).				
Graphics	Chip / Video RAM	Embedded management controller chip / 32 MB				
	Graphic display / resolution	16,770,000 colors: 640x840, 800x600, 1,024x768, 1,280x1,024				
Interface		5x USB3.0 (2x front, 2x rear, 1x internal), 1x USB2.0 (1x internal) 2x Analog RGB (Mini D-Sub15 pin, 1x front, 1x rear) 1x Serial port (RS-232C compliant / D-Sub 9 pin, Serial port A, 1x rear, optional port can be used (up to two ports in total), 1x Management LAN connector (1000BASE-T/100BASE-TX/10BASE-T, RJ45, 1x rear) (With optional LOM card, 4x 1000BASE-T, 2x 10GBASE-T, 2x 10GBASE-SFP+, or 2x 1000BASE-T can be added)				
Redundant power supply		Supported (option, hot-plug available)				
Redundant fan		Supported (standard, hot-plug available)				
External dimensions (width × depth × height)		439.8 mm x 722.0 mm x 43.4 mm (front bezel / protrusions / inner rails excluded) 482.4 mm x 766.1 mm x 43.4 mm (front bezel / protrusions / inner rails included)				
Weight (Minimum *3/ Max.)		13.3 kg / 21.0 kg (including rails)				
Power supply unit		None (optional), AC power supply unit 460 W/800 W 80 PLUS Platinum compliant (bipolar grounded outlet) (hot-plug available) (Max: 2) AC 100 V/200 V ± 10%, 50/60 Hz ± 3 Hz (Power cable is a required option) 800 W 80 PLUS Titanium compliant (bipolar grounded outlet) (hot-plug available) (Max: 2) AC 200 V ± 10%, 50/60 Hz ± 3 Hz (Power cable is a required option)				
Power consumption (100 V at maximum configuration, at 25ºC high-load state)		253VA/252W	349VA/346W	331VA/329W	350VA/347W	424VA/421W
Power consumption (100 V at maximum configuration, at maximum power)		445VA/442W	530VA/526W	513VA/509W	541VA/537W	605VA/601W
Environmental requirements Temperature/Humidity		Operating: 10 to 40°C / 20 to 80%, Storage: –10 to 55°C / 20 to 80% (no condensation either when operating or when stored)				
Main accessories		Getting Started, Safety Precautions and Regulatory Notices, slide rails, Front Bezel				
Installed OS:		–				
Supported OSs:		Microsoft Windows Server 2008 R2 Standard, Microsoft Windows Server 2008 R2 Enterprise, Microsoft Windows Server 2012 Standard, Microsoft Windows Server 2012 Datacenter, Microsoft Windows Server 2012 R2 Standard, Microsoft Windows Server 2012 R2 Datacenter, VMware ESXi™ 5.5 Update 2, VMware ESXi™ 6.0				

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

*2   Prepare this if required. For the principal uses of a Flash FDD, see the notes on Flash FDD in *Maintenance Guide*.

*3   Minimum configuration for operation (1x CPU, 2x DIMM, 1x HDD, 1x Power supply unit)

Code Number			N8101-		
			1037F	1045F	1046F
CPU	CPU		Intel Xeon processor		
			E5-2650L v4	E5-2609 v4	E5-2660 v4
	Clock speed		1.70GHz	1.70GHz	2.00GHz
	Number of CPUs, standard / maximum		1/2		
	Intel Smart Cache (Last Level Cache)		35MB	20MB	35MB
	Number of cores (C) / Number of threads (T) per CPU		14C/28T	8C/8T	14C/28T
Chipset			Intel C612 chipset		
Memory	Capacity, standard/maximum		None (optional) /Registered DIMM : 384 GB (24x 16 GB), Load Reduced DIMM : 768 GB (24x 32 GB)		
	Memory module		DDR4-2400 Registered DIMM (4/8/16/32 GB), DDR4-2400 TSV Registered DIMM (64 GB)		
	Maximum operating frequency		2400MHz	1866MHz	2400MHz
	Error check, correction		ECC, x4 SDDC, Memory LockStep (x8 SDDC)		
	Memory sparing		Supported		
	Memory mirroring		Supported		
Storage	Hard disk drive	Internal (standard)	–		
		Internal (maximum)	2.5-inch HDD: SATA 8 TB (8x 1 TB), SAS 14.4 TB (8x 1.8 TB), 2.5-inch SSD: SATA 6.4 TB (8x 800 GB), SAS 3.2 TB (8x 400 GB)		
		Hot swap	Supported		
	Interface / RAID level		SATA 6 Gb/s : RAID 0/1/5/6/10/50/60 (optional), SAS 12 Gb/s : RAID 0/1/5/6/10/50/60 (optional)		
	Optical disk drive		Internal or external drive (optional) *1		
	FDD		Optional: Flash FDD (1.44 MB) *2		
	Expansion bay		-		
Expansion slots	Supported slots		1x PCI Express 3.0 (x8 lane, x8 socket)(full-height, length 220 mm) 1x PCI Express 3.0 (x8 lane, x8 socket) (low-profile, length 220 mm)(Optional) 1x PCI Express 3.0 (x8 lane, x8 socket) (for RAID controller) 1x PCI Express 3.0 (x8 lane, x8 socket) (for LOM card) With optional riser card installed, can be changed to PCI Express 3.0 (x16 lane, x16 socket).		
Graphics	Chip / Video RAM		Embedded management controller chip / 32 MB		
	Graphic display / resolution		16,770,000 colors: 640x840, 800x600, 1,024x768, 1,280x1,024, 1,600x1,200		
Interface			5x USB3.0 (2x front, 2x rear, 1x internal), 1x USB2.0 (1x internal) 2x Analog RGB (Mini D-Sub15 pin, 1x front, 1x rear) 1x Serial port (RS-232C compliant / D-Sub 9 pin, Serial port A, 1x rear, optional port can be used (up to two ports in total), 1x Management LAN connector (1000BASE-T/100BASE-TX/10BASE-T, RJ45, 1x rear) (With optional LOM card, 4x 1000BASE-T, 2x 10GBASE-T, 2x 10GBASE-SFP+, or 2x 1000BASE-T can be added)		
Redundant power supply			Supported (optional, hot-plug available)		
Redundant fan			Supported (standard, hot-plug available)		
External dimensions (width × depth × height)			439.8 mm x 722.0 mm x 43.4 mm (front bezel / protrusions / inner rails excluded) 482.4 mm x 766.1 mm x 43.4 mm (front bezel / protrusions / inner rails included)		
Weight (Minimum *3/ Max.)			13.3kg / 21.0kg (including rails)		
Power supply unit			None (optional), AC power supply unit 460 W/800 W 80 PLUS Platinum compliant (bipolar grounded outlet) (hot-plug available) (Max: 2) AC 200 V ± 10%, 50/60 Hz ± 3 Hz (Power cable is a required option) 800 W 80 PLUS Titanium compliant (bipolar grounded outlet) (hot-plug available) (Max: 2) AC 200 V ± 10%, 50/60 Hz ± 3 Hz (Power cable is a required option)		
Power consumption (100 V at maximum configuration, at 25ºC high-load state)			330VA/328W	265VA/263W	445VA/442W
Power consumption (100 V at maximum configuration, at maximum power)			512VA/508W	456VA/453W	626VA/622W
Environmental requirements Temperature/Humidity			Operating: 10 to 40°C / 20 to 80%, Storage: –10 to 55°C / 20 to 80% (no condensation either when operating or when stored)		
Main accessories			Getting Started, Safety Precautions and Regulatory Notices, slide rails, Front Bezel		
Installed OS:			–		
Supported OSs:			Microsoft Windows Server 2008 R2 Standard, Microsoft Windows Server 2008 R2 Enterprise, Microsoft Windows Server 2012 Standard, Microsoft Windows Server 2012 Datacenter, Microsoft Windows Server 2012 R2 Standard, Microsoft Windows Server 2012 R2 Datacenter, VMware ESXi™ 5.5 Update 2, VMware ESXi™ 6.0		

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

*2　　Prepare this if required. For the principal uses of a Flash FDD, see the notes on Flash FDD in *Maintenance Guide*.

*3　　Minimum configuration for operation (1x CPU, 1x DIMM, 1x HDD, 1x Power supply unit, LOM card)

2. Interrupt Lines

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

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

3. Glossary

Terms	Description
BIOS Setup Utility (SETUP)	Software for setting BIOS. You can run this software by pressing <F2> key during POST.
BMC	Baseboard Management Controller (BMC) is a built-in controller that supports the IPMI version 2.0 protocol. BMC can manage the server hardware.
BMC RESET Switch	A switch for resetting the BMC of the server. This resets the BMC without clearing the BMC settings. Use the switch if the problem on the BMC occurs.
DUMP Switch	A switch that is used for collecting the memory dump if an error occurs. You can specify the destination of the dump by using the OS function.
EXPRESSBUILDER	Standard software for setting up the server easily. This also includes several useful applications and instruction manuals.
EXPRESSSCOPE ENGINE 3	A name of BMC for NEC Express5800 series.
EXPRESSSCOPE Profile Key	A removable flash memory that stored the settings of BIOS and BMC. If the motherboard of the server is replaced, you can use former settings when moving this flash memory from the former motherboard.
Express Report Service	Software that can report the server failure to the contact center by E-mail or modem. This software is installed with NEC ESMPRO ServerAgentService to the server.
Express Report Service (HTTPS)	Software that can report the server failure to the contact center by HTTPS. This software is installed with NEC ESMPRO ServerAgentService to the server.
Express Report Service (MG)	Software that can report the server failure to the contact center by E-mail, modem or HTTPS without NEC ESMPRO ServerAgentService. This software is installed with NEC ESMPRO Manager to "PC for Management".
ExpressUpdate	A feature for updating BIOS, firmware, driver, or software of the server. This feature is available when NEC ESMPRO Manager cooperates with EXPRESSSCOPE ENGINE 3 and ExpressUpdate Agent.
ExpressUpdate Agent	Software for performing ExpressUpdate. This is installed to the server.
Flash FDD	An optional USB device that can use as a floppy disk drive.
Internal Flash Memory	A built-in flash memory that stored EXPRESSBUILDER as standard. You can start EXPRESSBUILDER from it without DVD when pressing <F3> key during POST.
NEC ESMPRO	Standard software for the server management. This consists of several applications for managing or monitoring.
NEC ESMPRO Agent Extension	Software for performing the scheduled operations. This works with NEC ESMPRO Manager.
NEC ESMPRO Manager	Software for managing 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.
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

Document Number	Date Issued	Description
10.114.01-101.01	June 2016	Newly created

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NEC Express Server

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User's Guide

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