NEC

User's Guide

NEC Express Server
Express5800 Series

Express5800/T110i
EXP334, 334A

10.116.02-101.02
Aug 2018

Manuals

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

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

EXPRESSBUILDER

📄 User's Guide

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

📄 Installation Guide (Windows)

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

📄 Maintenance Guide

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

📄 Other manuals

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

Contents

Conventions Used in This Document

Signs and symbols for safety

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

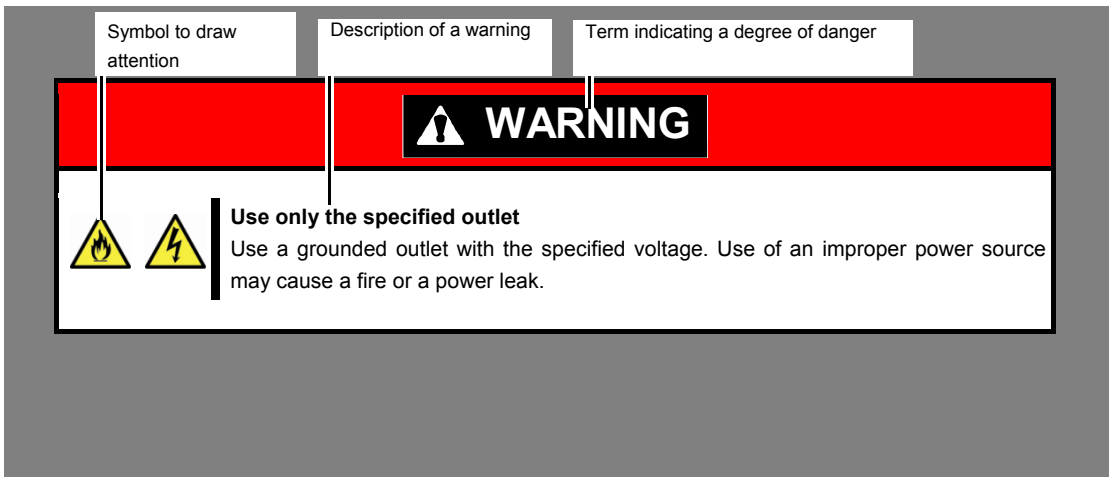
WARNING Indicates there is a risk of death or serious personal injury

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)



Notations used in the text

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

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

Optical disk drive

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

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

Hard disk drive

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

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

Removable media

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

- **USB flash drive**
- **Flash FDD**

Abbreviations of Operating Systems

Windows Operating Systems are referred to as follows.

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

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

POST

POST described in this document refers to the following.

- Power On Self-Test

BMC

BMC described in this document refers to the following.

- Baseboard Management Controller

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EDK/EDKII

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

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

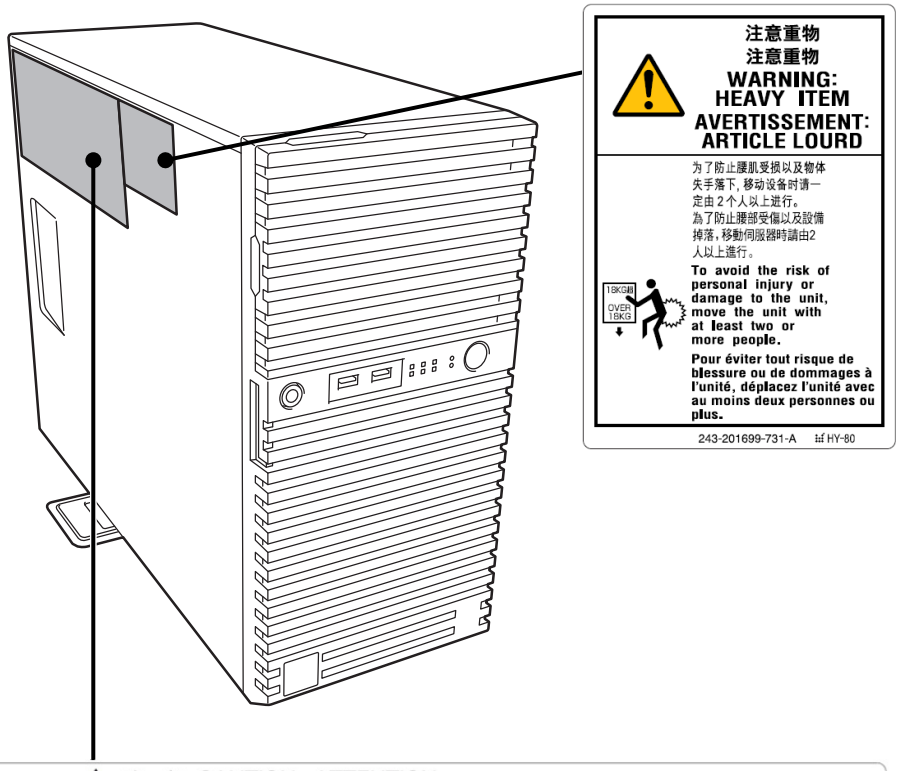
http://www.nec.com/

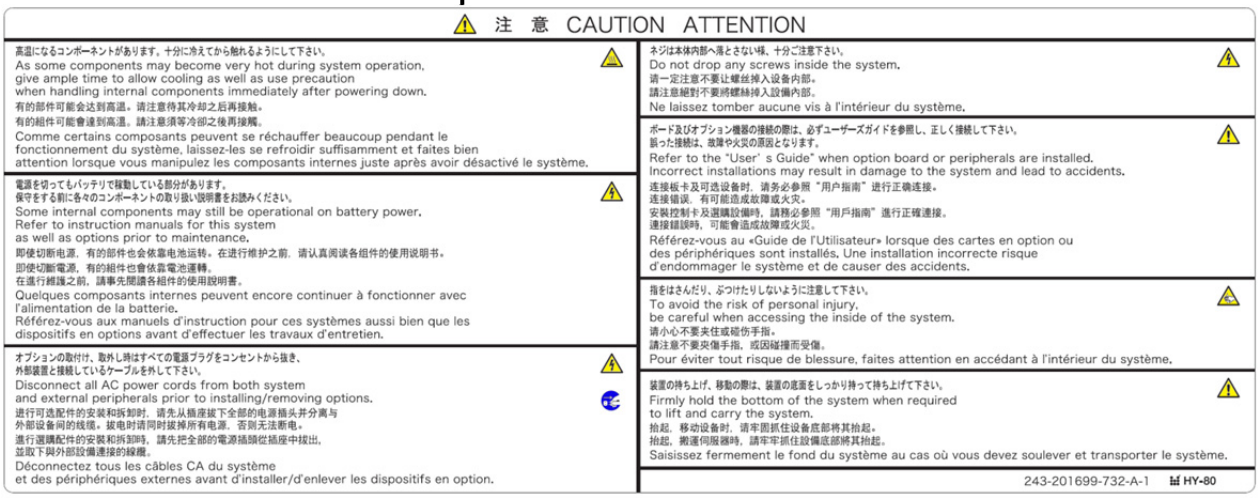
Safety notes

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

Warning labels

Warning labels are attached on or near the components with potential hazards. These labels are either attached or printed on the component.
Do not remove or black out this label and keep it 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 phones and switch off them near the server. Electric waves from such devices can cause server to malfunction.
- Install the server in an appropriate place. For details, see *Chapter 2 (2. Installation and Connection)*.
- If a peripheral device is a not plug-and-play device, make sure that the server is off and unplug the power cord before connecting/removing cables to/from the 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 turning on the server after turning off the server. If any Uninterruptible Power Supply (UPS) unit is connected, set it to wait for at least 30 seconds before turning on the server after power off.
- Do not press the POWER switch to turn on the server before the STATUS LED (amber) is unlit.
- 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.
- We do not guarantee that the server's optical disk drive will play a copy-protected CD that does not conform to standards.
- In the following cases, check and adjust the system clock before operation.
  - After transportation
  - After storage
  - After the server is used following a period of disuse, in which storage conditions did not conform to those that guarantee server operations (temperature: 5°C to 40°C (when the high-temperature environment is set: 5 to 48°C (it's subject to composition restrictions.)); humidity: 10% to 85% (10% to 80% (when internal LTO is installed)).
- Check the system clock approximately once per month.
- We recommend you store the server at room temperature. Keep the following storage conditions. Temperature: 10°C to 55°C, Humidity: 10% to 85% (10% to 80% (when internal LTO is installed), No condensation of moisture)
- 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 5°C or more differences between the room temperature and atmospheric temperature)

  Disk devices: Approximately 2 to 3 hours Tape media: Approximately 1 day
- For optional devices, we recommend you use our NEC products. Even if they are successfully installed or connected, installation of unsupported devices can cause the server to malfunction or even failure. You will be charged to repair failure or damage caused by use of such products even within warranty period.

Tips for your health and safety

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

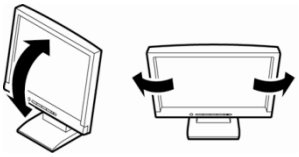
Keep proper posture

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

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

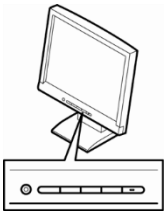
Adjust the angle of your display

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



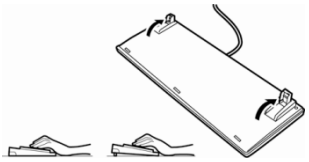
Adjust the brightness and contrast of the display

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



Adjust the angle of keyboard

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



Clean your equipment

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

Take rest breaks

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

NEC Express5800 Series
Express5800/T110i

1 General Description

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

1. **Introduction**

2. **Accessories**
   Describes the accessories of the server.

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

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

1. Introduction

Thank you for purchasing this NEC Express5800 Series product.
This high performance server is powered by the latest Intel processor.

- Intel Xeon Processor
- Intel Core i3 Processor
- Intel Pentium Processor
- Intel Celeron Processor

NEC's latest technology and architectures realize high-power and high-speed operation that cannot be matched by existing servers.
The server is designed with consideration of not only reliability but also expandability, which enables you to use it as a network server.

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

2. Accessories

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

- 2× Bezel Lock Key
- 8× Screw for fix to back-up devices
- 1× or 2×*1 Power Cord
- SDR Update CD-ROM
- 1× or 2×*1 Cable Ties (for securing AC power cord)
- Getting Started
- Safety Precautions and Regulatory Notices

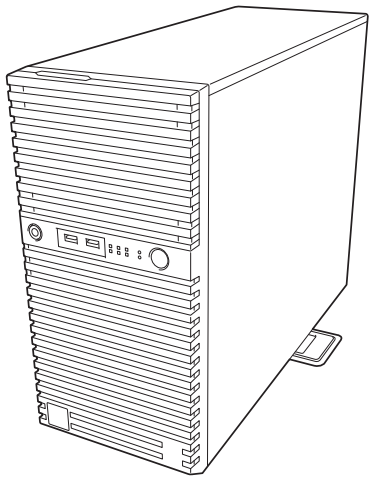
*1 EXP334A only

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 standard features:



High performance

- Intel Xeon, Pentium, Core-i3, Celeron processor
- Turbo Boost feature *1
- Hyper Threading feature *1
- High-speed memory access (DDR4 2400 supported)
- High-speed disk access (SATA2 6 Gbps, SAS 12 Gbps supported)
- High-speed 1000BASE-T (2 ports) interface
  (1 Gbps/100 Mbps/10 Mbps supported)

High reliability

- Processor throttle-ring feature
- Memory monitoring feature (error correction/error detection)
- Memory degeneracy feature (logical isolation of a failed device)
- Bus parity error detection
- Temperature detection
- Error detection
- Internal fan monitoring feature
- Internal voltage monitoring feature
- RAID system (disk array)
- Auto rebuild feature (hot swapping supported)
- BIOS password feature
- The security lock that comes with Front Bezel
- 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 saving and noiseless design

- Power monitoring feature
- Power control feature
- High-efficiency power supply supporting 80 PLUS Platinum / Gold.
- Fan control appropriate to environment, work load, and configuration
- Enhanced Intel SpeedStep Technology supported
- Cold redundant feature*2

Expandability

- Various IO option slots
  - PCI Express 3.0 (x 16 lanes) : 1 slot
  - PCI Express 3.0 (x 4 lanes): 1 slot
  - PCI Express 2.0 (x 2 lanes): 1 slots
  - PCI Express 2.0 (x 1 lanes): 1 slots
- Large memory of up to 64 GB
- Backup device bay provided as standard
- USB 3.0 interface (requires the supporting OS)
- Three LAN connectors (one for management LAN)

Ready to use
- Hard disk drives can be installed with one-touch setup, which requires no cables (requires Hot Plug Drive Cage Kit)

Various built-in features
- El Torito Bootable CD-ROM (no emulation mode) format supported
- Software power-off
- Remote power-on feature
- AC-Link feature
- Remote console feature
- Baseboard Management Controller (BMC) conforming to IPMI v2.0

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

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

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

*1: Supporting this function depends on CPU type.
*2: EXP334A only

3.1 Firmware and Software Version Management

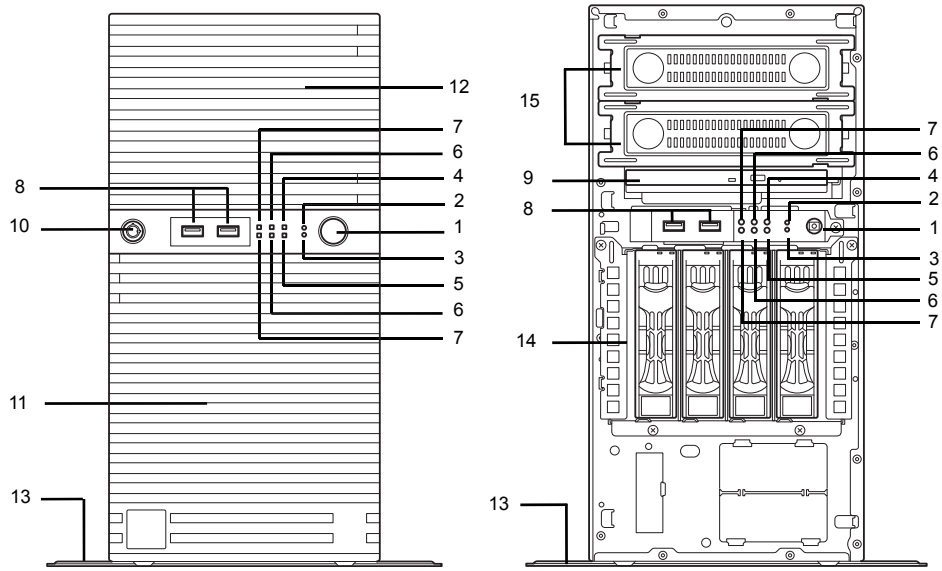
You can manage the version of firmware or software on the server and update them with an update package by using NEC ESMPRO Manager and ExpressUpdate Agent.

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

4. Names and Functions of Parts

The names and the functions of the server's parts are as follows.

4.1 Front of the Server



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

2 DUMP Switch (NMI)
A switch for collecting the memory dump.
Do not press DUMP Switch usually. If DUMP Switch is pressed, the server stops.

3 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).

4 POWER LED (green)
An LED for showing the power status of the server. This LED lights green when the power is ON.

5 Power Capping LED
An LED for showing the power capping status.

6 STATUS LED1,2 (1:green/2:amber)
An LED for showing the server status. See 4.5 Indicators for details.

7 Global LED 1, 2 (1:green/2:amber)
An LED for showing the hard disk drive status. See 4.5 Indicators for details.

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

9 Optical Disk Drive
An optical disk drive for reading a CD/DVD. Either of the following optional device can be installed.

(Must install following one certainly.)
– DVD-ROM drive
– DVD SuperMULTI drive
– ODD Bay Cover
The drive provides the following: an eject button to eject the tray; an LED that indicates the drive access; and an eject hole to eject the tray forcibly.

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

11 Front Bezel
A cover for protecting the front part of the server.

12 Front Door
A door for covering 5.25-inch devices and optical disk drive.

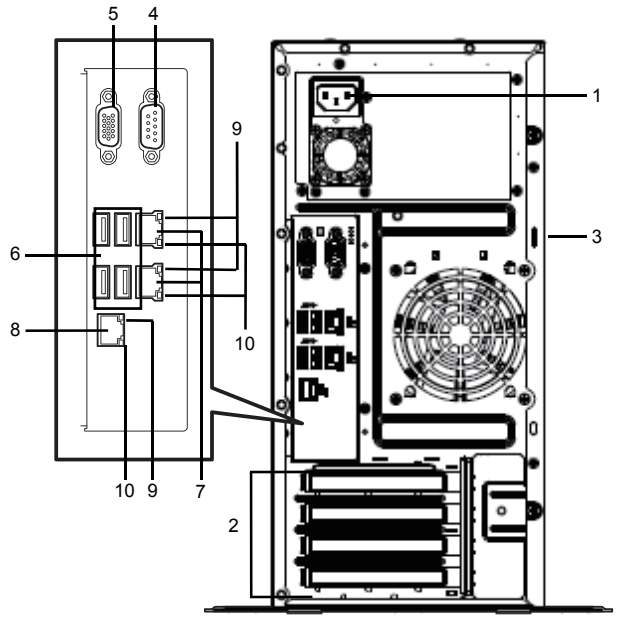
13 Stabilizer
Stabilizers for supporting the server.

14 HDD Bay
Bays for installing hard disk drives.

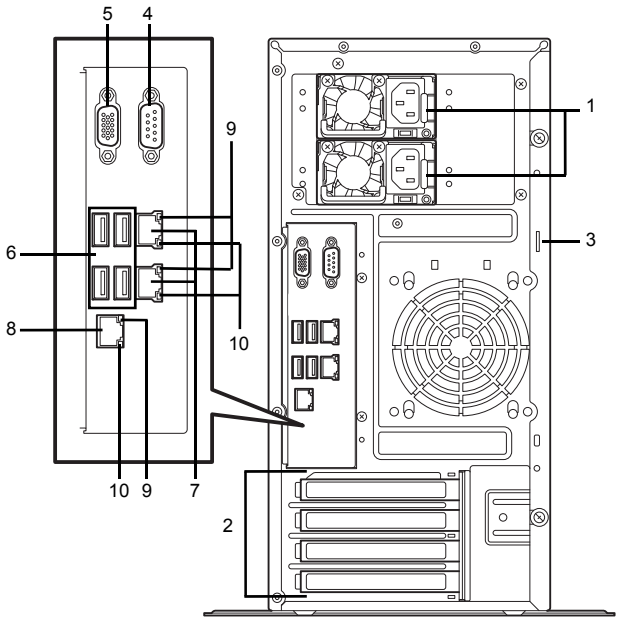
15 5.25-inch Expansion Bay
Bays for installing backup devices.

4.2 Rear View

<Non-redundant power supply model>



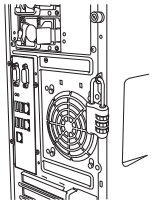
<Redundant power supply model>



1 AC Inlet
Sockets for connecting power cords.

2 PCI Slots
Slots for installing PCI cards.

3 Chassis Lock Tab
A tab for locking the side cover.



4 Serial Port (COM A) Connector
A connector for connecting serial interface devices. This cannot directly connect to a network line. If the optional N8117-01A Additional RS232C Connector Kit is connected, the connector of N8117-01A is assigned as the serial port B.

5 Display Connector
A connector for connecting a display

6 USB Connectors
Connectors for connecting USB3.0 interface devices.

7 LAN Connectors
Connectors for connecting to a network (1000BASE-T/100BASE-TX /10BASE-T).
If Shared BMC LAN feature is enabled in ROM Utility, LAN1 connector can also be used as the management LAN connector. Sharing port is not recommended from the point of performance and security.

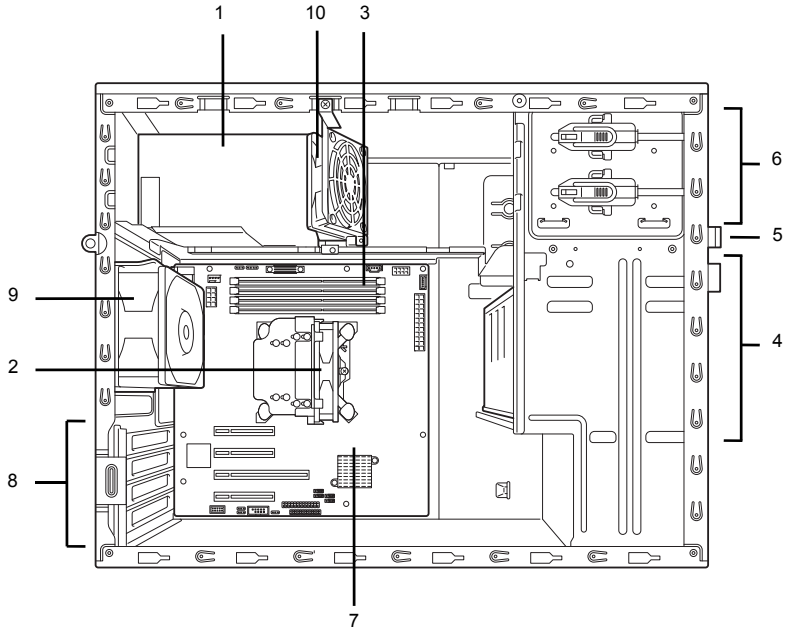
8 Management LAN Connector
A LAN connector (1000BASE-T/100BASE-TX /10BASE-T) for connecting EXPRESSSCOPE Engine 3. This connector cannot be used as a normal LAN port. This port cannot be used when Shared BMC LAN feature is used.

9 LINK/ACT LED (green)
LEDs for showing the access status of LAN

10 SPEED LED (green/amber)
LEDs for showing the transfer speed of LAN ports

4.3 Internal View

<Non-redundant power supply model>
The images below do not show the duct.



1 Power Supply Unit

2 Cooling Fan (CPU)

3 DIMM Slots

4 Hard Disk Drive Bay

The figure shows the view when 2.5-inch hard disk drives are installed.

5 Optical Disk Drive

6 5.25-inch Expansion Bay

A bay to mount the backup device.

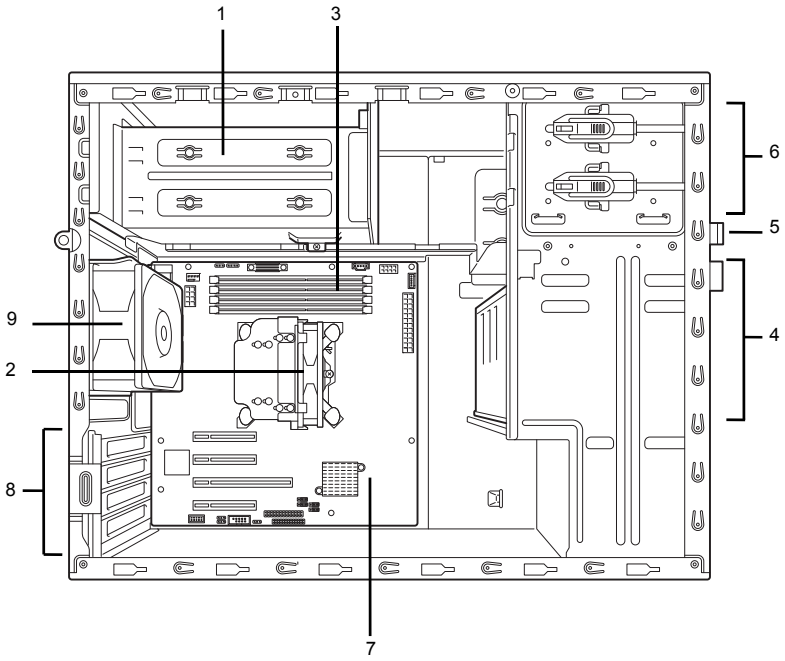
7 Motherboard

8 PCI Slot

9 Cooling Fan (rear)

10 Cooling Fan (for cooling Power Supply Unit)

<Redundant power supply model>
The images below do not show the duct.



1 Power Supply Unit

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3 DIMM Slots

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The figure shows the view when 2.5-inch hard disk drives are installed.

5 Optical Disk Drive

6 5.25-inch Expansion Bay

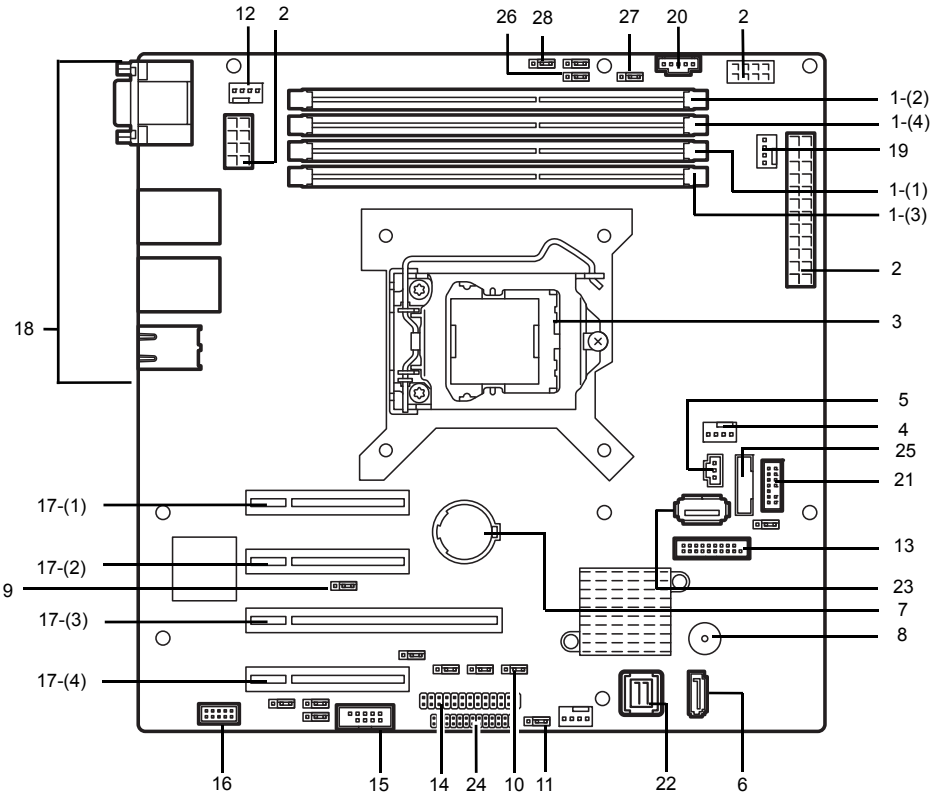
A bay to mount the backup device.

7 Motherboard

8 PCI Slot

9 Cooling Fan (rear)

4.4 Motherboard



1 **DIMM Slots** (the number after hyphen indicates DIMM number)

2 **Power Connector**

3 **CPU Socket**

4 **CPU Cooling Fan Connector (FAN1)**

5 **RAID LED Cable Connector**

6 **Serial ATA Connector (for ODD)**

7 **Lithium Battery**

8 **Buzzer**

9 **Clear CMOS Jumper**

10 **RAID Configuration Jumper**

11 **Clear Password Jumper**

12 **Rear Fan Connector (FAN2)**

13 **USB Connector (for front)**

14 **Front Panel Cable Connector**

15 **Serial Port (COM B) Connector (for N8117-01A)**

16 **SPI Flash Mezzanine Connector**
EXPRESSSCOPE profile key (SPI memory) has been installed, where BIOS and BMC configuration data is stored. Move it when replacing MB to keep using the data.

17 **PCI Card Slots**
17-(1) PCI EXPRESS x2 (x8 connector)
17-(2) PCI EXPRESS x1 (x8 connector)
17-(3) PCI EXPRESS x16 (x16 connector)
17-(4) PCI EXPRESS x4 (x8 connector)

18 **External Connector**

19 **Power Supply Unit Fan Connector (FAN3)**

20 **PMBus Connector**

21 **TPM Kit Connector**

22 **Mini-SAS HD Connector**

23 **USB Connector (for internal)**

24 **HDD BP Connector**

25 **Dust Proof Sensor Cable Connector**

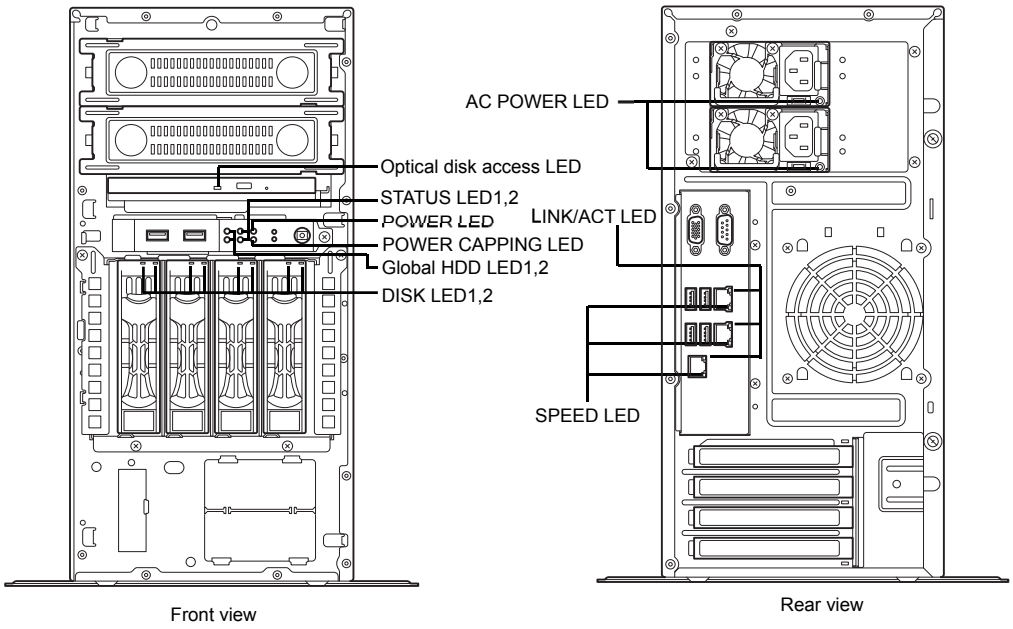
26 **Fan Configuration Jumper**

27 **Power Supply Unit Configuration Jumper**

28 **High Temperature Support Option Configuration Jumper**

4.5 Indicators

This section explains the meanings of the following LEDs.



4.5.1 POWER LED (⏻)

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

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

4.5.2 STATUS LED 1, 2 (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.

The next table lists STATUS LED patterns, their description and action. If the LED indication does not change even if the action below is performed, contact your sales representative.

Tips Refer to the system event log (SEL) by using NEC ESMPRO or the offline maintenance utility to view the cause of failure.

STATUS LED 1, 2 pattern		Description	Action
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.
Blinking (green)	Off	Memory is in a degraded state	Find the device in degraded state by using BIOS Setup Utility (SETUP), and replace it as soon as possible.
		A correctable memory error has often occurred.	
		Operating while CPU error is detected.	
		In redundant power configuration, power is not supplied to either of power unit.	
Off	Off	The power is off.	Turn on the server.
		POST is in progress.	Wait for a while. STATUS LED will turn green after POST completes.
		Watchdog timer expired.	Turn off the power and then turn it on. If POST displays any error message, take notes of the message, and contact your sales representative.
		Memory dump is being requested. Note: The LED remains green if the dump is caused by software.	Wait until the memory dump is completed.
Off	On (amber)	A temperature alarm was detected.	Check the internal fan for dusts. Also check if the fan unit is properly connected.
		A CPU error occurred.	Turn off the power and then turn it on. If POST displays any error message, take notes of the message, and contact your sales representative.
		A PCI system error occurred	
		A PCI parity error occurred	
		A PCI bus error occurred.	
		A voltage alarm was detected.	Contact your sales representative.
		Sensor error was detected.	
		A CPU temperature alarm was detected.	
		An error occurred on Intel Node Manager (one of the features of EXPRESSSCOPE Engine 3).	
Off	Blinking (amber)	Power Supply Unit is failing (in power redundant configuration).	Contact your sales representative.
		A fan alarm was detected.	Check if the internal fan cable is properly connected.
		A temperature warning was detected.	Check the internal fan for dusts. Also check if the fan unit is properly connected.
		A voltage warning was detected	Contact your sales representative.
		One or more hard disk drives are failing (Only when a RAID system configuration was built hot-plug HDD).	

4.5.3 Global HDD LED (1-  -2)

Global HDD LED indicates the status of the internal hard disk drive or optical disk drive.

Global HDD1, 2 LED pattern		Configuration	Description
Global HDD LED 1	Global HDD LED 2		
On/blinking (green)	Off	All	Accessing to hard disk drive or optical disk drive.
Off	On (amber)	In case that RAID is constituted with optional RAID controller. In case that RAID is constituted with 3.5-inch or 2.5-inch Hot Plug Drive Cage Kit.	Hard disk drive is failing. The LED may be lit few seconds after power is turned on or reset, and this is normal behavior.
Blinking (green)	Blinking (amber)		Rebuilding is in progress.
Off	Off	All	No access and No HDD fault

4.5.4 Power Capping LED

Power Capping LED indicates enabled/disabled status of Power Capping feature as shown below.

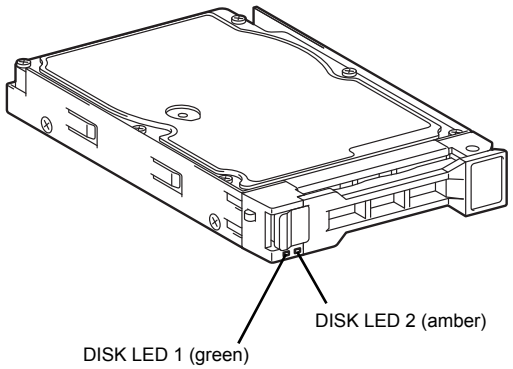
Power Capping LED pattern	Description
On (green)	Power Capping feature is enabled.
Blinking (green)	Power Capping is enabled and power control (capping) is working.
Off	Power Capping feature is disabled.

4.5.5 Optical Disk Access LED

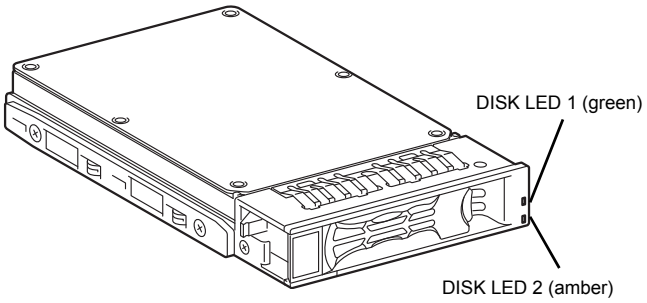
The LED lights/blink when a CD/DVD the media set on the optical disk drive is being accessed.

4.5.6 LED on a hard disk drive

If 3.5-inch or 2.5-inch Hot Plug Drive Cage Kit is installed, each drive has its respective LED (Disk LED).



2.5-inch Hard Disk Drive



3.5-inch Hard Disk Drive

DISK1 LED 1,2 pattern		Configuration	Description	Action
DISK LED 1	DISK LED 2			
On/blinking (green)	Off	3.5-inch or 2.5-inch Hot Plug Drive Cage Kit is installed.	Hard disk drive is being accessed.	–
Off	On (amber)	RAID constitution that 3.5-inch or 2.5-inch Hot Plug Drive Cage Kit is installed.	Hard disk drive is failing.	Contact your sales representative.
Blinking (green)	Blinking (amber)		Rebuilding is in progress.	–
Off	Off	3.5-inch or 2.5-inch Hot Plug Drive Cage Kit is installed.	Hard disk drive is halted.	–

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

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

4.5.7 LINK/ACT LED (1, 2, M)

This LED indicates the status of the LAN port.

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

4.5.8 SPEED LED (1, 2, M)

This LED indicates which network interface is used.

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

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.

4.5.9 AC POWER LED

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

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

NEC Express5800 Series
Express5800/T110i

2 Preparations

This chapter describes preparations for using this server.

1. **Installing Internal Optional Devices**

   Describes how to install or remove optional devices.

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

2. **Installation and Connection**

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

1. Installing Internal Optional Devices

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

Important **If you use the third party optional device to the server, and it causes failure, a charge for repairing must be paid even within the warranty period.**

1.1 Safety Precautions

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

⚠ WARNING

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

- **Do not disassemble, repair, or modify the server.**
- **Do not remove the lithium, NiMH, or Li-ion battery.**
- **Do not handle the server while the power plug is inserted into the outlet.**

⚠ CAUTION

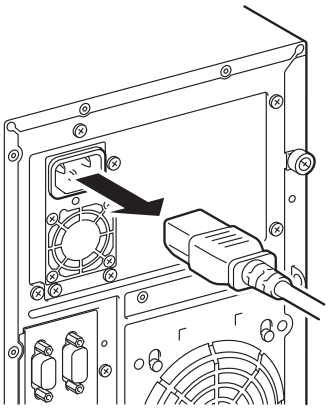
Be sure to observe the following precautions to use of the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions and Regulatory Notices.*

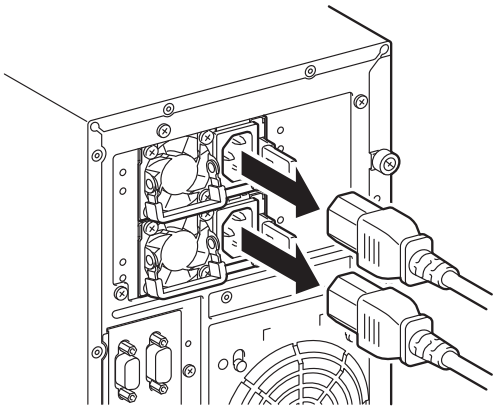
- **Do not attempt to lift the server by gripping the front bezel or vent holes cover.**
- **Make sure to complete installation.**
- **Do not get your fingers caught.**
- **High temperature.**

1.2 Overview of Installation and Removal

Install/remove components by using the following procedure.

1. Turn the server off.
   See *Chapter 3* (*6. Turning off the Server*).
2. Disconnect all the power cables connected to the server from the outlet, and then disconnect them from the server.





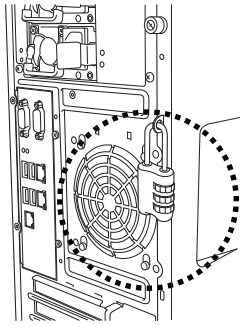
3. Disconnect all cables connected to the connector at the rear.
4. Remove the side cover.
   See *Chapter 2 (1.3. Removing the Side Cover)*.
5. Remove the front bezel if applicable.
   See *Chapter 2 (1.4 Removing the Front Bezel)*.
6. Depending on the components to be installed or removed, follow the procedure in order.
   See *Chapter 2* (*1.5 TPM Kit* to *1.13 Backup Devices)*.
7. Connect cables
   See *Chapter 2* (*1.15 Connecting Cables)*.
8. Attach the front bezel.
   See *Chapter 2 (1.16 Attaching the Front Bezel)*.
9. Attach the side cover.
   See *Chapter 2* (*1.17 Installing the Side Cover)*.

Continue the setup while referring to *Chapter 2 (2.2 Connection)*.

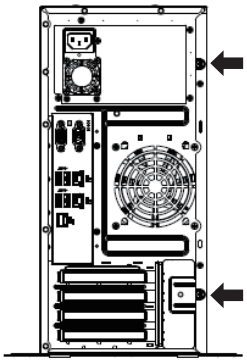
1.3 Removing the Side Cover

Remove the side cover by using the following procedure.

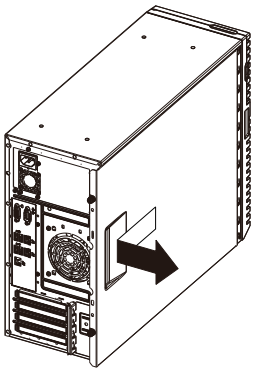
1. See steps 1 to 3 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Unlock the chassis, if necessary.



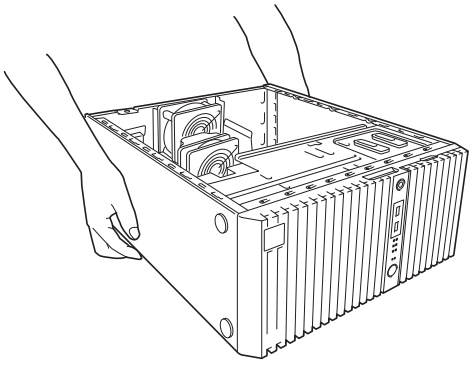
3. Remove the two screws on the rear panel.



4. Remove the side cover, holding it firmly.



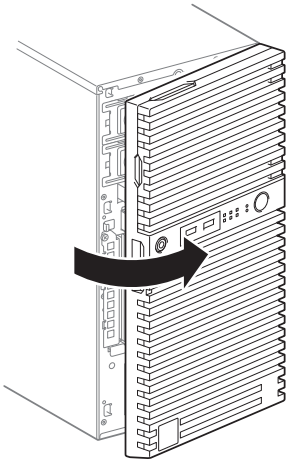
5. Remove the front bezel, if necessary.
   Carefully lay the unit on its side, right side down.



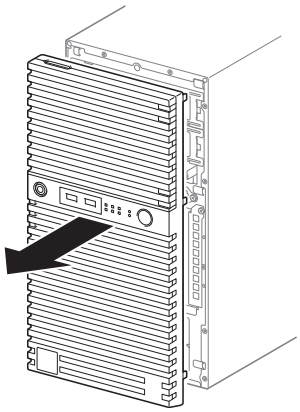
1.4 Removing the Front Bezel

Remove the front bezel by using the following procedure.

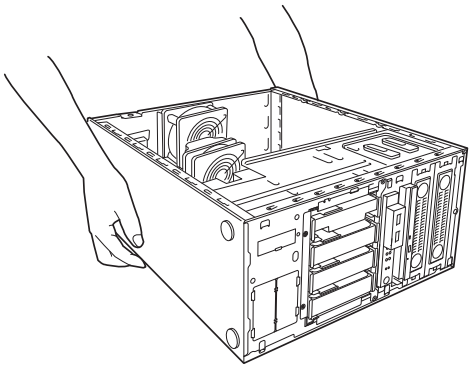
1. See steps 1 to 3 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Using the indentation on the left side of the front bezel, pull the front bezel forward until the tab pops out of the frame.



3. Continue opening the front bezel until the three tabs on the right side of the server pop out and the front bezel is completely removed.

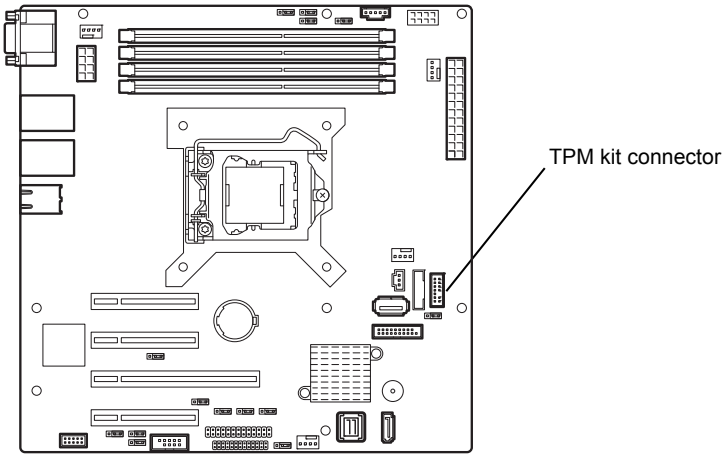


4. Carefully lay the server on its side, right side down.



1.5 TPM Kit

This section describes the procedure for installing optional TPM Kit.



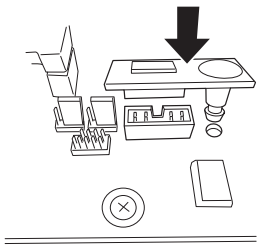
1.5.1 Installation

Install the TPM Kit in accordance with the following procedure.

Note The TPM kit once installed cannot be removed.

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

2. Install the TPM Kit and secure it by pushing the nylon rivet that comes with the TPM Kit.



1.6 DIMM

Install a Dual In-line Memory Module (DIMM) to a DIMM slot on the motherboard in the server. The motherboard provides four slots to install DIMMs.

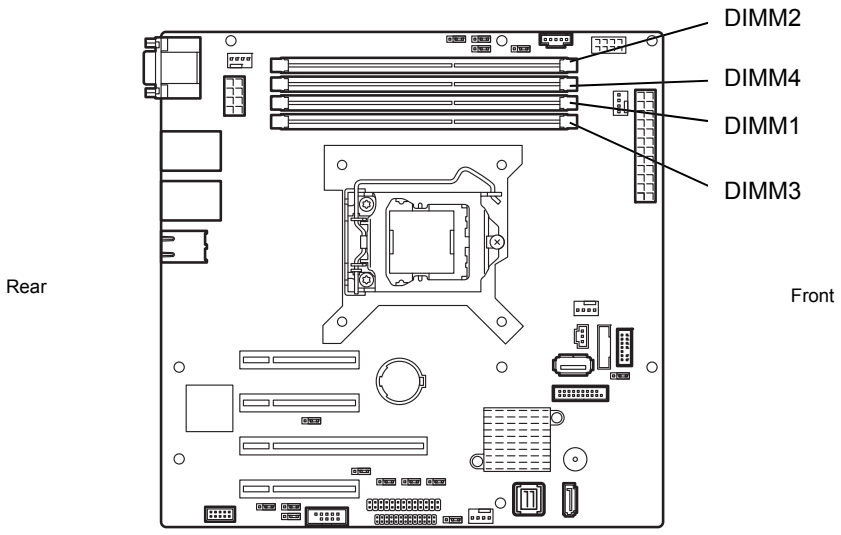
Up to 64 GB (16GB × 4) of memory can be installed.

Important

- **Use only the DIMMs specified by NEC.**
- **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*.**

Tips

As about 750 MB of memory is used for PCI resources, the available memory size may be less than the mounted memory size.



Motherboard

This server supports 2-way Interleave mode.

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

1.6.1 Maximum supported memory size

The maximum available memory size on the server depends on the architecture (x86 architecture) and OS specs.

A list of maximum memory sizes

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

1.6.2 Installation order

Install DIMMs one by one in order of increasing memory size into slots in the order of DIMM#1, DIMM#2, DIMM#3, and DIMM#4. If you want to run the server in 2Way Interleave mode, observe the following installation rules:

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

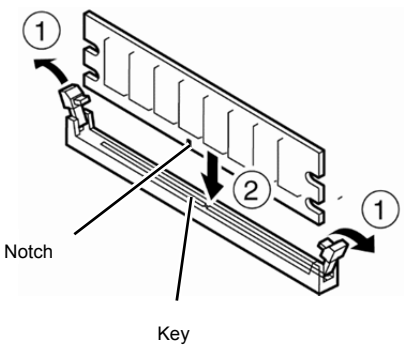
Installation examples

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

1.6.3 Installation

Install a DIMM by using the following procedure.

1. See steps 1 to 5 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. Hold the server with both hands and slowly and gently lay it so that the left side faces upward.
3. Open both levers of the target DIMM slot outward.
4. Hold the DIMM vertically and push it into the slot.
   When the DIMM is inserted correctly, the lever automatically closes.



Important **Do not apply too much pressure when you push a DIMM into the socket.**

Note Align the notch on the DIMM with the key on the slot.

5. Firmly close the lever.
6. Continue to install or remove internal optional devices, mount and connect the server, and turn it on.
7. 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*".
8. Run the BIOS Setup Utility, go to the **Advanced** menu, and check the **Memory Configuration**.
   Confirm that the added DIMM has been recognized in the BIOS. Confirm that the applicable **DIMM Group Status** is set to "Normal". See *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*".
9. Set the paging file size to the recommended value (Total memory size x 1.5) or more.
   When using a Windows OS, see *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "*Installation Guide (Windows)*".
   For other OS, see the manual provided with the operating system or contact your sales representative.

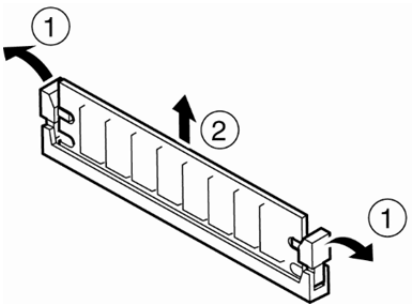
1.6.4 Removal

Remove a DIMM in the following procedure.

Note

- When removing a defective DIMM, check error messages displayed at POST or NEC ESMPRO and check the DIMM slot where the defective DIMM is installed.
- At least one DIMM needs to be installed for the server to operate.

1. See steps 1 to 5 in *Chapter 2 (1.2 Overview of Installation and Removal* for preparations.
2. Open both levers of the target DIMM slot outward.
   The DIMM is unlocked
3. Remove the DIMM by pulling it out from the slot in a straight direction.



Important **Do not apply too much pressure when you pull a DIMM out from the socket.**

4. Assemble the server.
5. Turn on the server and confirm that no error messages are displayed on POST. If any error message is displayed, see *Chapter 3 (1. Post Error Message)* in "*Maintenance Guide*".
6. If you replaced a broken DIMM, choose **Yes** in **Memory Configuration**-**Memory Retest** of the **Advanced** menu, and then choose **Save Changes and Exit** to restart.
7. Set the paging file size to the recommended value (Total memory size x 1.5) or more.
   When using a Windows OS, see *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "*Installation Guide (Windows)*".
   For other OS, see the manual provided with the operating system or contact your sales representative.

1.7 Use of Internal Hard Disk Drives in the RAID System

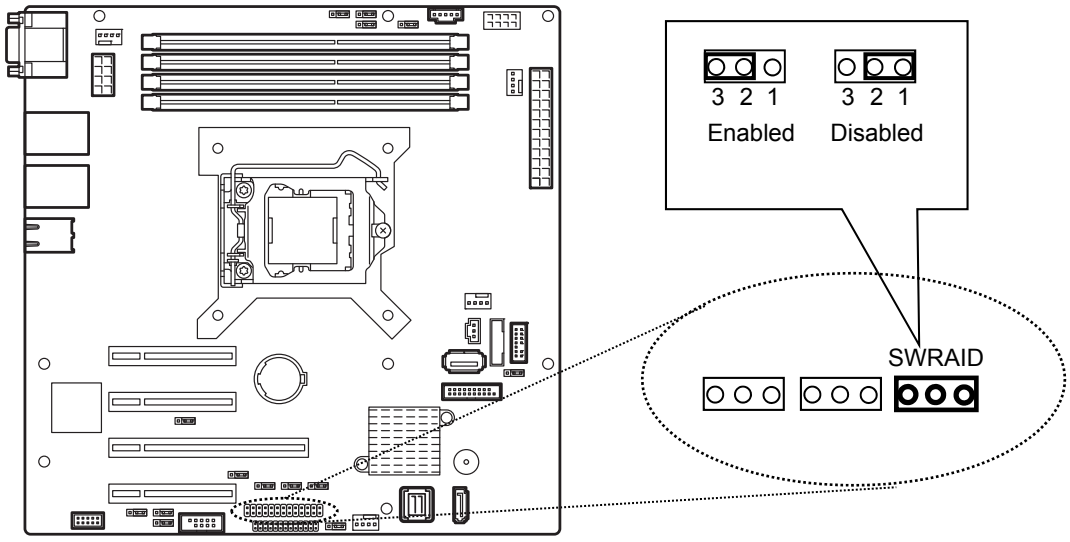
This section describes how to use the hard disk drives installed in the HDD cage at the front of the server in the RAID system.

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

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

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

To build a RAID system, change the jumper switch on motherboard, as shown below.



Motherboard

(a) Using the Software RAID (SW-RAID)

Enable SW RAID by changing jumper setting on motherboard.

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

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

(b) Using an optional RAID controller

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

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

(c) Installation

For the instruction of installing the optional RAID controller, see *Chapter 2 (1.9 PCI Card)*.

Important **When connecting a RAID controller, set the boot priority to 8th or higher in the Boot menu of the BIOS Setup utility. If the setting is 9th or lower, the configuration menu for RAID controllers cannot be launched.**

(d) Removal

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

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

1.7.1 Notes on setting up a RAID system

Note the following points when setting up a RAID system.

- The number of hard disk drives required varies depending on the RAID level.
- If SW RAID controller or an optional RAID controller (N8103-176/188/205/206/210) is used, the RAID system cannot be built in RAID5/RAID6/RAID50/RAID60.

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

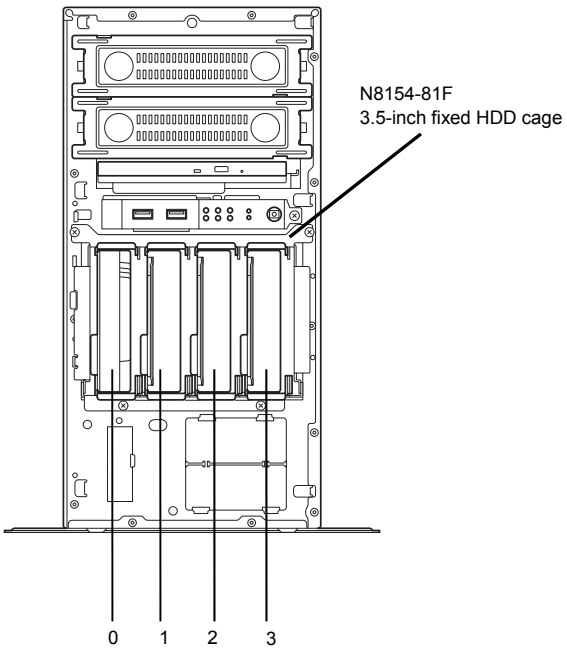
- Use SAS/SATA hard disk drives or SSDs that have the same capacity and rotational speed.
- RAID 10 using a hard disk drive of 2 TB or more cannot be supported if an on-board RAID controller is used.
- When installing an OS in your RAID system, you can easily complete the setup process, including RAID configuration and OS installation, by using EXPRESSBUILDER.
- If *Overview of Installation and Removal* are installing the OS manually, use the RAID system configuration utility. The utility can be run during POST which starts immediately after the server is turned on. For details, see *Chapter 2 (5. RAID System Configuration)* in "*Maintenance Guide*" or the manual supplied with the optional RAID controller.

Important

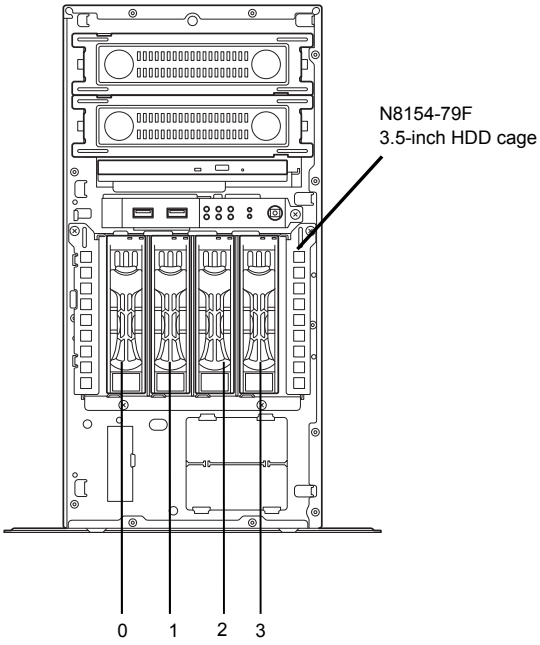
- **Do not change the RAID system mode to hibernate.**
- **A mix of SAS and SATA drives cannot be used within the RAID system.**

HDD slot numbering

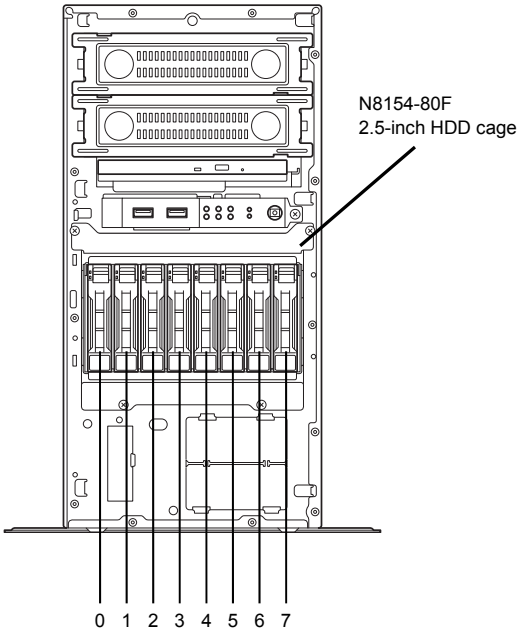
<3.5-inch fixed HDD cage installed>



<3.5-inch HDD cage installed>



< 2.5-inch HDD cage installed>



1.8 Flash Backup Unit for RAID Controller

The optional flash backup unit is used in order to avoid data loss caused by accidents during a write-back operation.

- For N8103-176/177/178, use N8103-180 flash backup unit
- For N8103-206/207/208, use N8103-209 flash backup unit

1.8.1 Handling precautions

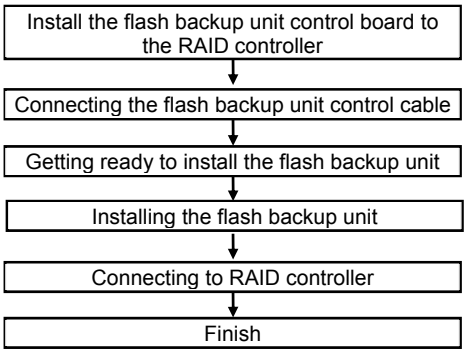
Observe the following precautions to use the flash backup unit. Ignoring the precautions may damage your assets (data or other devices).

- Use the dedicated flash backup unit supporting the RAID controller which is used.
- Before installing the flash backup unit, touch the metal frame part of the server to discharge the static electricity from your body.
- Do not drop or bump the flash backup unit.
- For recycling and disposing the flash backup unit, refer to the manual that comes with it.

1.8.2 Installing the flash backup unit

Install the N8103-180/209 flash backup unit by following procedure.

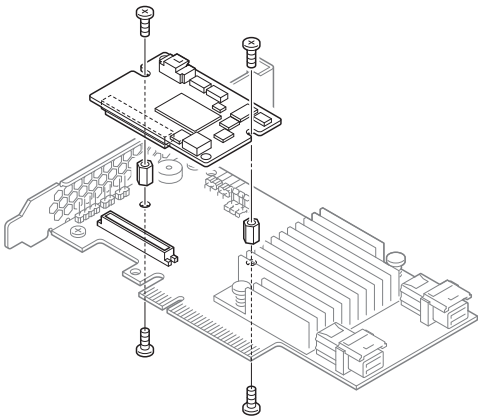
Note Read through the manual supplied with the RAID controller and the flash backup unit before installation.



Installing the flash backup unit control board

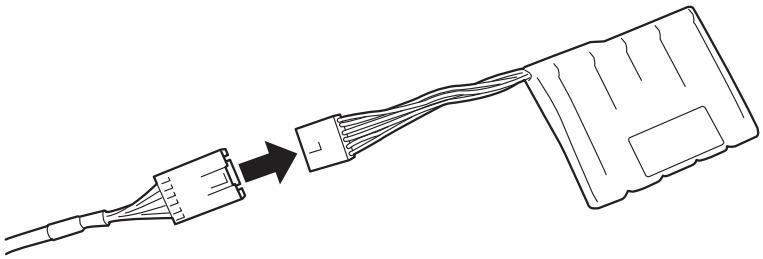
Install the control board of the flash backup unit to the RAID controller while referring to the User's Guide for the RAID controller.

Tips The following diagram shows an example of N8103-176/177/178. The control board part is installed to N8103-206/207/208 as standard.



Connecting the flash backup unit control cable

To connect the flash backup unit control cable into the battery pack, see the following figure. Check the form of the connector and connect the cable straight into the connector.

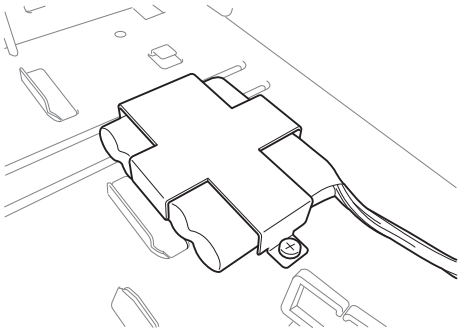


Getting ready to install the battery

1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover and the front bezel, see *Chapter 2 (1.3 Removing the Side Cover* and *1.4 Removing the Front Bezel).*

Installing the flash backup unit

1. Install the flash backup unit to this server with one screw and fixing bracket provided with the flash backup unit.



Important **Make sure that the battery bracket is correctly attached to the server.**

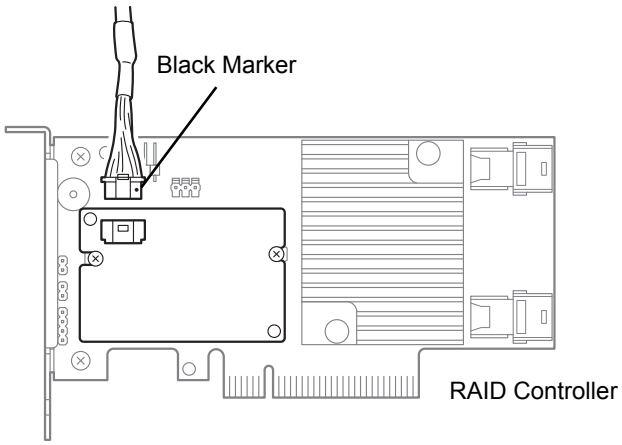
Connecting to a RAID controller

1. Connect another connector of the flash backup unit control cable to the RAID controller. Check the marker of the connector and connect the cable straight into the connector. Be careful not to press it in at an angle when connecting.

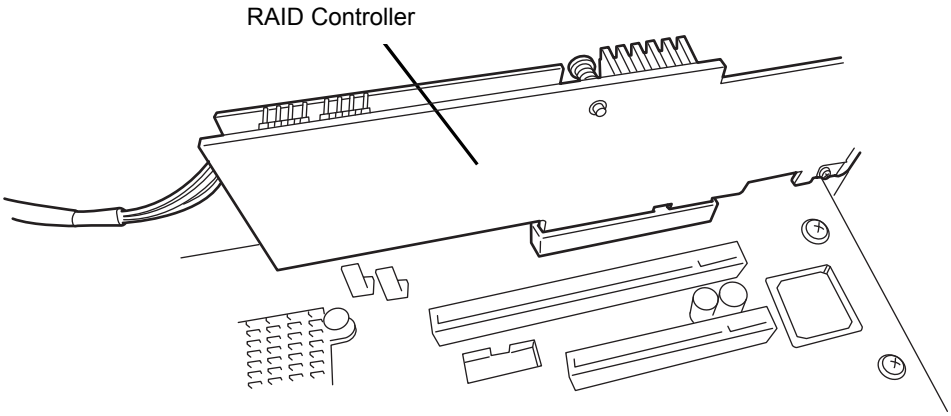
Position of the connector

Connect the cable to the connector shown in the figure below.

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



2. Install the RAID controller into the PCI slot #4 and fix it in place. Be careful not to disconnect the cable.



3. Connect the cables and components that you removed.

1.8.3 Removal

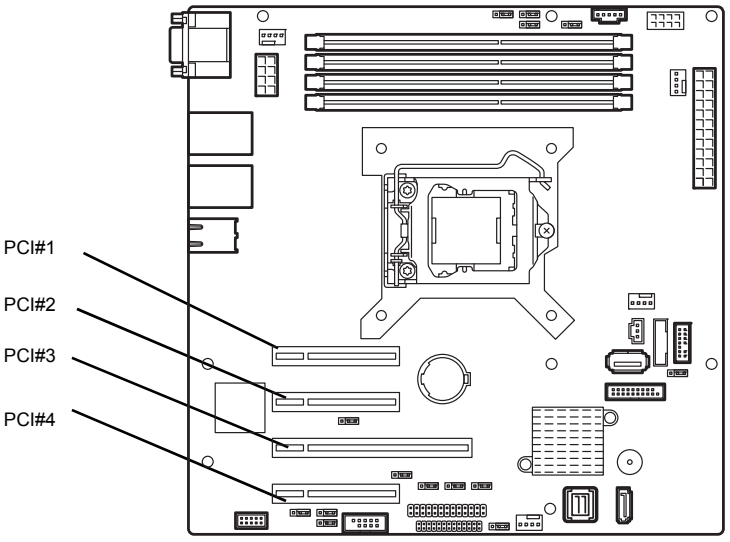
To remove the flash backup unit, reverse the installation procedure.

1.9 PCI Card

This server provides four slots where PCI cards can be installed.

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*.**
- **When installing PCI cards, see *Chapter 2 (1.9.2 List of optional devices and installation slots)* to prevent mistaking slot numbers.**
- **Configure the Option ROM in [PCI Configuration] according to the application of the installed PCI card. For the configuration instructions, see *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*".**
  Disabling the deployment of Option ROM can not only prevent memory consumption but also shorten the startup time.



Motherboard

1.9.1 Notes

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

- Do not touch the terminals of cards and the leads of electronic components with your bare hand. Fingerprints and dust left on them cause the server to malfunction due to a connection failure or damage to the leads.
- The search order for PCI bus slot on boot is as follows.
  Slot 3 → Slot 1 → Slot 4 → Slot 2
- The PCI devices of the same type (including onboard PCI device) may be recognized in different order from that described above, depending on OS or RAID System BIOS utility. Check the slot location of PCI device by PCI bus number, device number and function number shown in the table below.

PCI device	PCI bus number	Device number	Function number
Onboard NIC1	8Fh	0	0
Onboard NIC2	8Fh	0	1
Slot 1	60h	×	×
Slot 2	30h	×	×
Slot 3	1h	×	×
Slot 4	90h	×	×

- Set **Disabled** for the optional ROM of a LAN device not to be booted by using the BIOS Setup utility.
- If an additional bootable PCI card (such as a RAID controller, SAS controller, or LAN card) is installed, the boot priority may change. After the installation, set the boot priority in the **Boot** menu of the BIOS Setup utility.
- If a bootable device such as a PCI card and USB device is added, the boot priority might be changed. In this case, configure the boot priority for **Hard Drive BBS Priorities** in the **Boot** menu of the BIOS Setup utility.
  Boot → **Hard Drive BBS Priorities** → Check the display
  If the boot device is an HDD under an optional RAID controller, the display is `(Bus xx Dev 00) PCI RAID Adapter`.
  Note that the value for *xx* changes depending on the PCI slot where a RAID board is installed.

1.9.2 List of optional devices and installation slots

Model name	Product name		PCI Express3.0				Remark	
			PCI#1	PCI#2	PCI#3	PCI#4		
		PCI slot performance*1	X2 lane	X1 lane	x16 lane	x4 lane		
		PCI slot size	Full Height					
		PCI board socket type*1	x8	x8	x16	x8		
		Size of mountable board	168 mm or less	168 mm or less	312mm	168mm		
N8103-142	SAS controller (card performance: PCI Express 2.0 (x8))		–	○	○	○	For connecting internal/external devices. Cannot be connected to internal hard disk drives.	
N8103-184	SAS controller (card performance: PCI Express 3.0 (x8))		–	–	○	○	For connecting external devices. Cannot be connected to internal hard disk drives.	
N8103-205	RAID controller (RAID 0/1) (card performance: PCI Express 3.0 (x8))		–	–	–	○	For connecting internal hard disk drives Cannot be connected to the flash backup unit.	Only one card can be inserted For the non-redundant power configuration, the optional power supply fan is required.
N8103-210	RAID controller (2 GB, RAID 0/1) (card performance: PCI Express 3.0 (x8))		–	–	–	○		
N8103-211	RAID controller (2 GB, RAID 0/1/5/6) (card performance: PCI Express 3.0 (x8))		–	–	–	○		
N8103-206	RAID controller (2 GB, RAID 0/1) (card performance: PCI Express 3.0 (x8))		–	–	–	○	For connecting internal hard disk drives Can be connected to the flash backup unit	
N8103-207	RAID controller (2 GB, RAID 0/1/5/6) (card performance: PCI Express 3.0 (x8))		–	–	–	○		
N8103-208	RAID controller (4 GB, RAID 0/1/5/6) (card performance: PCI Express 3.0 (x8))		–	–	–	○		
N8103-188	RAID controller (RAID 0/1) (card performance: PCI Express 3.0 (x8))		–	–	–	○	For connecting internal hard disk drives Cannot be connected to the flash backup unit.	
N8103-176	RAID controller (1 GB, RAID 0/1) (card performance: PCI Express 3.0 (x8))		–	–	–	○	For connecting internal hard disk drives Can be connected to the flash backup unit (N8103-180)	
N8103-177	RAID controller (1 GB, RAID 0/1/5/6) (card performance: PCI Express 3.0 (x8))		–	–	–	○		
N8103-178	RAID controller (2 GB, RAID 0/1/5/6) (card performance: PCI Express 3.0 (x8))		–	–	–	○		
N8118-307	Dual M.2 SATA mount kit		○	○	–	–	M.2 SATA mount kit	
N8104-150	1000BASE-T connection board (1ch) (card performance: PCI Express 2.0 (x1))		○	○	○	○	For additional LAN Card type: PCI Express 2.0(x4)	
N8104-151	1000BASE-T connection board (2ch) (card performance: PCI Express 2.0 (x1))		○	○	○	○	For additional LAN Card type: PCI Express 2.0(x4)	
N8104-152	1000BASE-T connection board (4ch) (card performance: PCI Express 2.0 (x4))		○	○	–	○	For additional LAN LAN cable boot cannot be used	
N8104-149	10GBASE adapter (SFP+/2ch) (card performance: PCI Express 2.0 (x8))		–	–	○	○	For additional LAN Purchase FP + module [N8104-129] as required.	
N8104-157	10GBASE adapter (2ch) (card performance: PCI Express 3.0 (x4))		–	–	○	○	For additional LAN Card type: PCI Express 3.0(x4)	
N8105-48	Graphics Accelerator (card performance: PCI Express 2.0 (x16))		–	–	○	–	For connecting dual monitors	
N8117-01A	Expansion RS-232C connector kit*2		○	○	○	○	For additional serial port (RS-232C)	

○ Can be installed – Cannot be installed

*1 Lane: Indicates the transfer performance (transfer bandwidth).
<e.g.> 1 lane = 2.5 Gbps (unidirectional), 4 lanes = 10 Gbps (unidirectional)
Socket: Indicates the connector size. A card up to the number of sockets can be connected.
<e.g.> x4 socket = x1 card, x4 card can be installed. x8 card cannot be installed.

*2 The N8117-01A expansion RS-232C connector kit contains two types of cables. This server uses the RS-232C cable (B).

- The depth of mountable boards is up to 168 mm (MD2).
- For details about the functions of each card, refer to the technical guide.
- The card performance described in the parentheses after the Product name indicates the maximum operation performance of the card.
- Even if you use PCI cards of a higher performance than the PCI slot, the operation of the device will be that of the PCI slot.

About the standard network

You can use functional equivalents of AFT/SFT/ALB teaming and bonding with the standard network and the following LAN cards:
N8104-150, N8104-151, and N8104-152

(1) PCI slot limitations

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

Processor	RAID controller required	PCI slot limitations
Celeron G3930	Yes	● Do not install the following PCI cards. N8103-184 SAS Controller N8104-157 Dual Port 10GBASE-T Adapter N8104-152 Quad Port 1000BASE-T Adapter N8104-151 Dual Port 1000BASE-T Adapter N8104-150 1000BASE-T Adapter N8104-149 10GBASE SFP+ Adapter (SFP+/2ch) ● Up to one card from the following can be installed. N8105-48 NVS315 GA
	No	● Up to one of either N8103-184 SAS Controller or N8104-152 Quad Port 1000BASE-T Adapter can be installed and up to one card from the following can be installed. Then, no limitations for other cards. N8104-157 Dual Port 10GBASE-T Adapter N8104-149 10GBASE SFP+ Adapter (SFP+/2ch) N8104-151 Dual Port 1000BASE-T Adapter N8104-150 1000BASE-T Adapter ● No limitations when N8103-184 SAS Controller or N8104-152 Quad Port 1000BASE-T Adapter is not installed.
Pentium G4560 Core i3-7300 Xeon E3-1220v6 Xeon E3-1225v6	Yes	● Up to two cards from the following can be installed. N8103-184 SAS Controller N8104-152 Quad Port 1000BASE-T Adapter ● No limitations for other cards.
	No	● Up to one card of N8103-184 SAS Controller can be installed. ● No limitations for other cards.
Other processors	–	No limitations

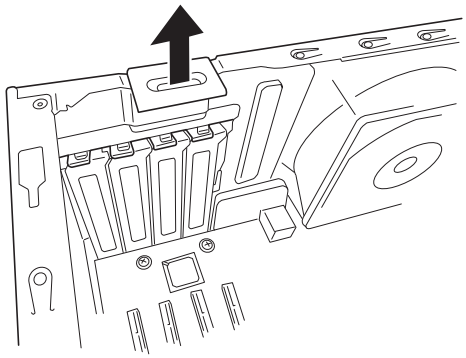
(a) PCI slot limitations for VMware

- Do not install N8104-152 Quad Port 1000BASE-T Adapter when any of the following cards is installed.
  N8104-157 Dual Port 10GBASE-T Adapter
  N8104-149 10GBASE SFP+ Adapter (SFP+/2ch)
- The number of installable N8104-150/-151 is limited up to one.
- For the configuration limitation for VMware ESXi, refer to the following documents.
  VMware ESXi 6.0
  https://www.vmware.com/pdf/vsphere6/r60/vsphere-60-configuration-maximums.pdf
  VMware ESXi 6.5 Later
  https://www.vmware.com/pdf/vsphere6/r65/vsphere-65-configuration-maximums.pdf

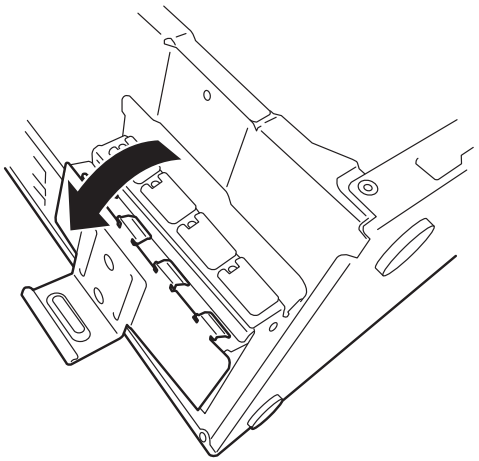
1.9.3 Installation

Install a PCI card to connect to a PCI slot by using the following procedure.

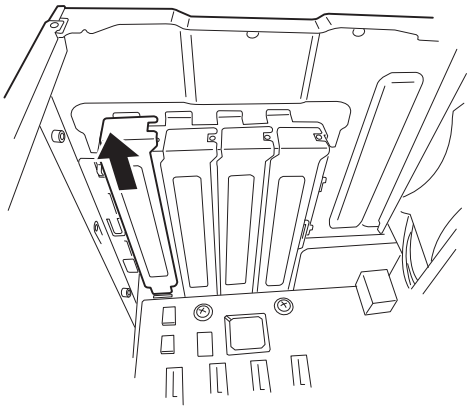
1. Before installation, make sure the switch or jumper settings on the PCI card are proper according to the instruction manual supplied with the card.
2. See steps 1 to 3 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
3. To remove the side cover, see *Chapter 2 (1.3 Removing the Side Cover)*.
4. Lift up the PCI retention latch tab until it clicks, indicating that the lock is released.



5. Rotate the PCI retention latch toward the rear of the server and push it back down.

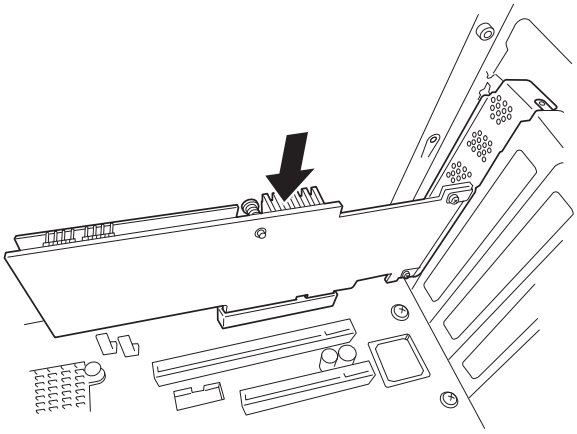


6. Remove the blank cover aligned with the slot where you install a card.



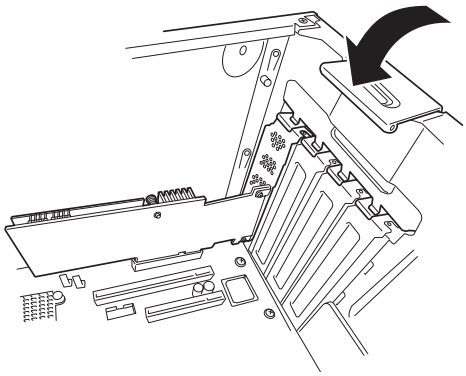
Important **Keep the removed blank cover for future use.**

7. Face the component side of the card toward the bottom of the server. When the rear panel of the card is firmly engaged with the spring, firmly press the card into the slot so that the component parts of the card securely connect to the slot.



Important **If you have trouble installing the card, remove the card once and try again. If you apply excessive pressure on the card, there is a risk of breaking the card.**

8. Close the PCI retention latch until it clicks, indicating that it is locked.



9. Assemble the server.
10. Turn on the server and confirm that no error messages are displayed in POST.
    If an error message is displayed, take notes on the message and ask your sales representative.

1.9.4 Configuration after installing

Depending on the type of card installed, you need to use a utility, such as the BIOS setup utility, a setup utility provided with the card, following installation to modify server settings.

Follow the instructions in the manual provided with the card to specify the correct settings.

After turning the server power on, the PCI bus numbers are scanned in ascending order. If the option ROM installed in the card contains a BIOS utility, the startup message (banner) is displayed in ascending order of the PCI bus numbers.

1.9.5 Removal

Remove a PCI card connected to a PCI slot by using the following procedure.

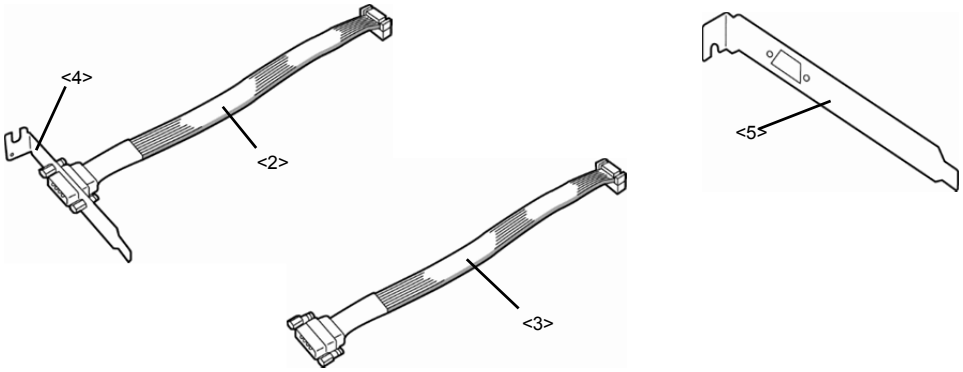
1. See steps 1 to 3 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover, see *Chapter 2 (1.3 Removing the Side Cover)*.
3. See installation steps 4 and 5 in Chapter 2 (*1.9.3 Installation*) to close the PCI retention latch.
4. Remove the card.
5. Attach the blank cover, and see installation step 8 in Chapter 2 (*1.9.3 Installation*) to close the PCI retention latch.
6. Assemble the server.
7. Turn on the server and confirm that no error messages are displayed in POST.
   If an error message is displayed, take notes on the message and ask your sales representative.

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

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

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

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

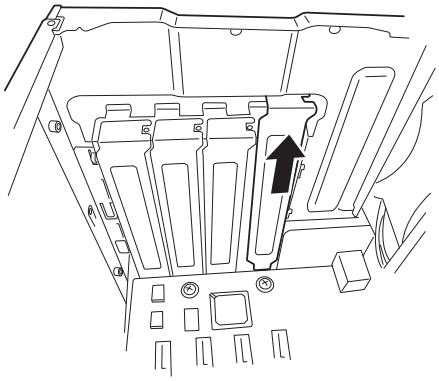


This product uses a combination of items <3> and <5>.

Follow the procedure below to install the kit.

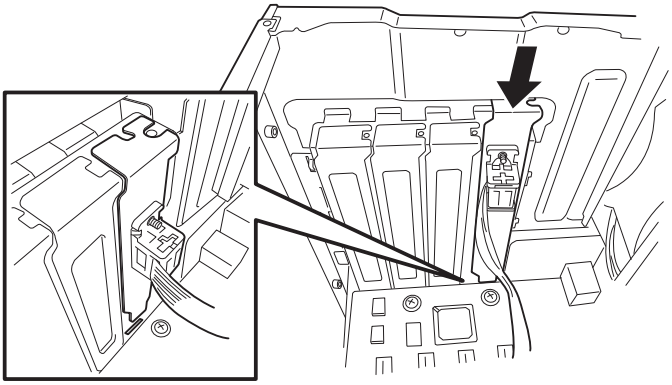
1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover, see *Chapter 2 (1.3 Removing the Side Cover)*.
3. Assemble <3> RS-232C cable (B) and <5> PCI bracket (2).

4. To open the PCI retention latch, see *Chapter 2 (1.9.3 Installation)*.
5. Remove the blank cover aligned with the slot where you install a card.



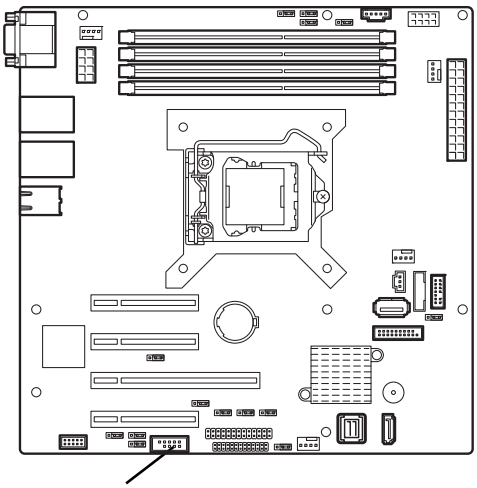
Important **Keep the removed blank cover for future use.**

6. Make sure that you are properly inserting the bracket edge into the frame guide, and attach it securely.



7. Arrange the cable so as not to buffer other PCI cards, and connect to the COM connector used for internal connections in the motherboard.
   See the following for the position of the COM connector for internal connections.

Important **Note the direction of the connector when connecting the cable.**



COM connector for internal connections
(serial port B (COM B))

8. Reassemble the server.

1.10 Power Supply Fan

In the following configuration of the non-redundant power source, the optional power supply support fan is required.

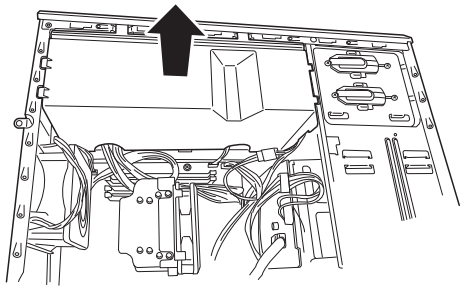
- When mounting the optional RAID controller
- When mounting the optional dustproof bezel
- When mounting the option responding to the high-temperature environment

Install the power supply support fan according to the following description.
Note that the power supply support fan varies depending on the type of the RAID controller.

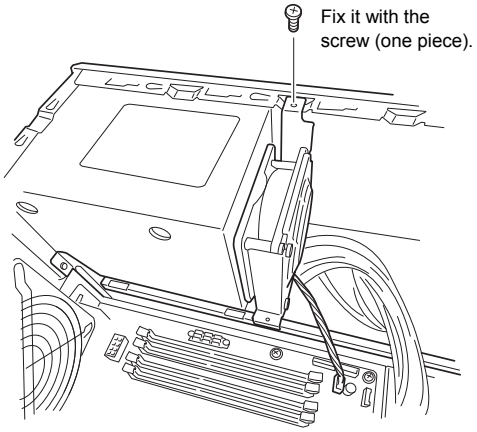
- N8181-132 Fixed power supply support fan: N8103-176/177/178/188
- N8181-178 Fixed power supply support fan: N8103-205/206/207/208/210/211

1.10.1 Installation

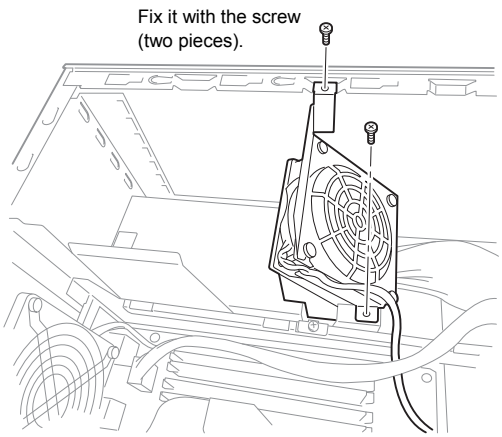
1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparation.
2. Remove the side cover while referring to *Chapter 2 (1.3 Removing the Side Cover)*.
3. Remove the duct.



4. Install the Power Supply Fan to the front of the power supply, and fix it by using attached one screw.

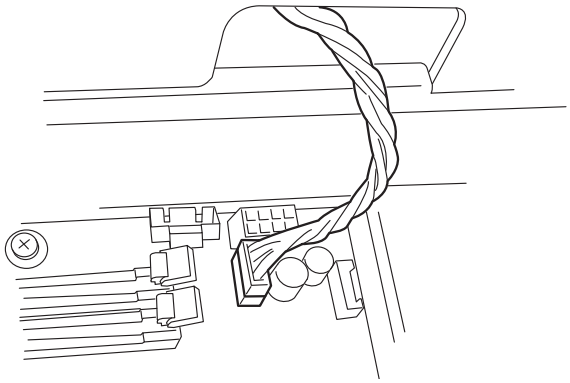


N8181-132F Power Supply Fan



N8181-178F Power Supply Fan

5. Connect the cable of the Power Supply Fan to the connector (FAN3) on the motherboard.



1.10.2 Removal

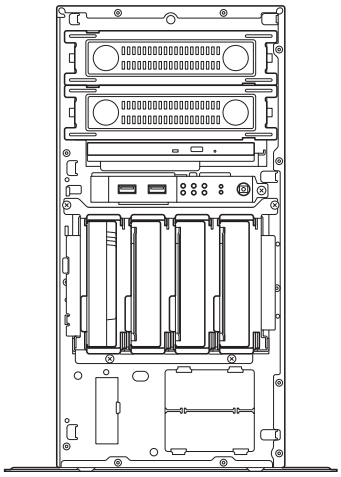
Remove the Power Supply Fan by reversing the installation procedure.

1.11 HDD Cages and Hard Disk Drives

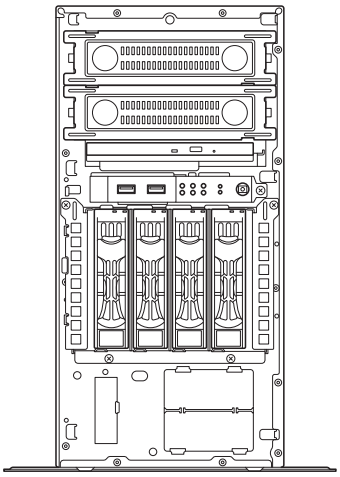
N8154-81F 3.5-inch fixed HDD cage, N8154-79F 3.5-inch HDD cage, or N8154-80F 2.5-inch HDD cage can be installed in the HDD bay in this server.

Important **Use hard disk drives provided by NEC.**

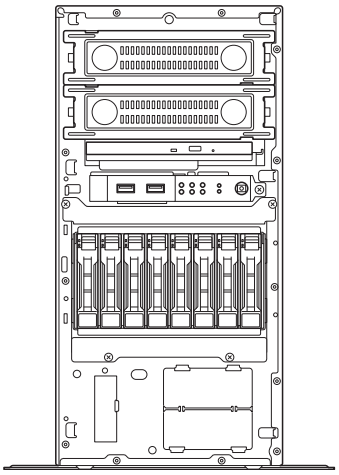
<3.5-inch fixed HDD cage installed>



<3.5-inch HDD cage installed>



<2.5-inch HDD cage installed>

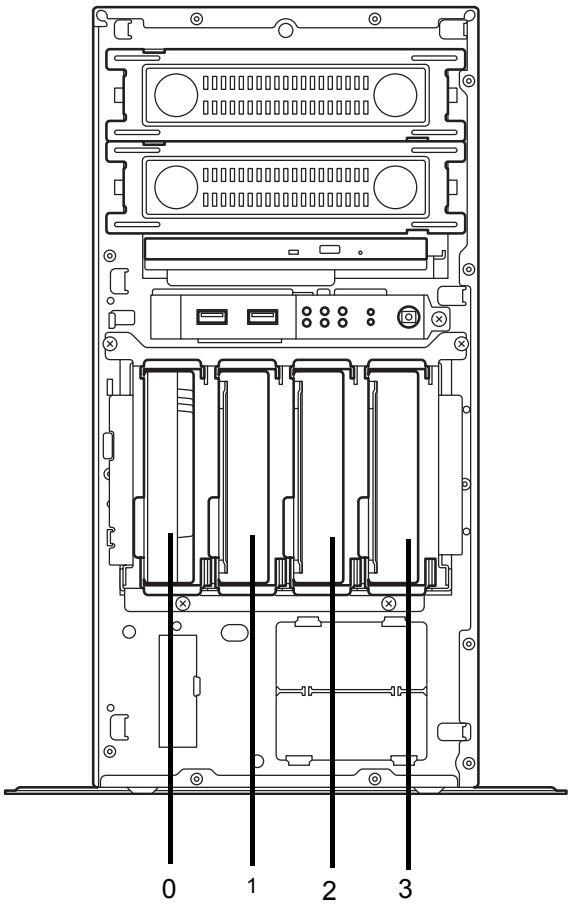


Important **Install the hard disk drives sequentially starting from slot 0.**

1.11.1 Installing a 3.5-inch fixed HDD cage and hard disk drives

By installing a 3.5-inch fixed HDD cage, up to four 3.5-inch SATA fixed hard disk drives can be mounted.

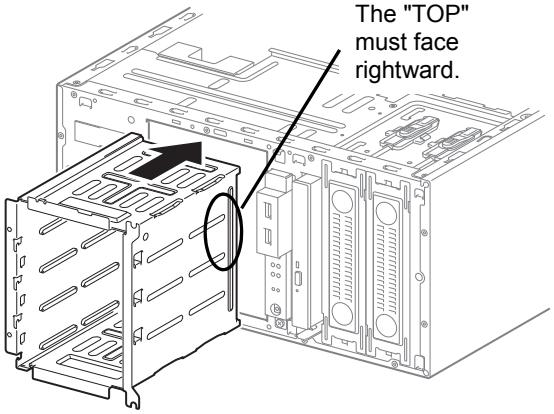
Important **Use hard disk drives provided by NEC.**



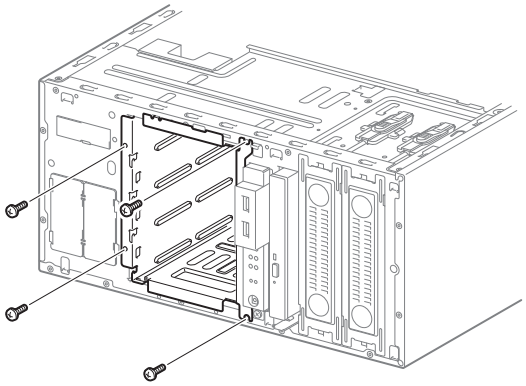
Important **Install the hard disk drives sequentially starting from slot 0.**

Install a 3.5-inch fixed HDD cage and hard disk drives in the server by using the following procedure.

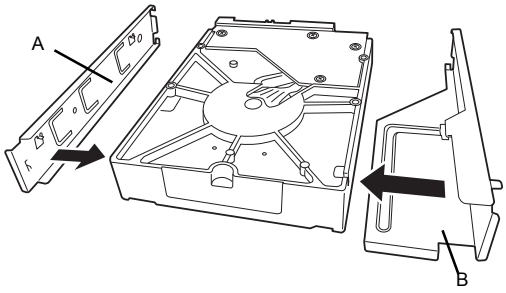
1. See steps 1 to 3 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover and front bezel, see Chapter 2 (*1.3 Removing the Side Cover* and *1.4 Removing the Front Bezel*).
3. Insert the HDD cage into the HDD bay. The "TOP" must face rightward.



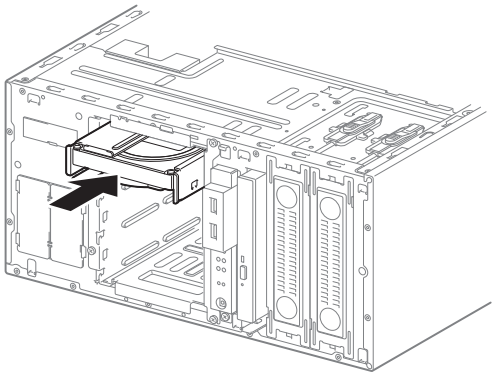
4. Attach the HDD cage by using the four screws.



5. Place the unit so that the flat face of the hard disk drive faces downward. Mount the HDD trays that come with the HDD cage from both sides of the 3.5-inch hard disk drive. Mount the tray marked "A" on the left side, and the tray marked "B" on the right side.



6. Insert the hard disk drive attached to the tray with HDD tray “A” facing the right side into the slot of the HDD cage until it clicks, indicating that it is locked.



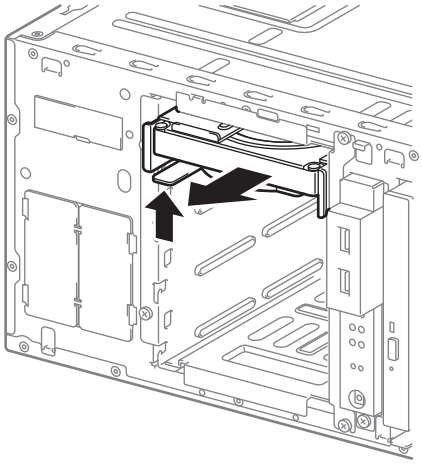
7. Connect the interface cables and power cable to the hard disk drive. Use the interface cables that come with the HDD cage. For details about cable connection, see *1.15 Connecting Cables*.

1.11.2 Removing the 3.5-inch fixed hard disk drives

Remove the 3.5-inch fixed hard disk drives from the HDD cage by using the following procedure.

Important **When disposing of the hard disk drives, follow the instructions described in *Chapter 1* (*15 Transfer, movement, and disposal*) in Safety Precautions and Regulatory Notices.**

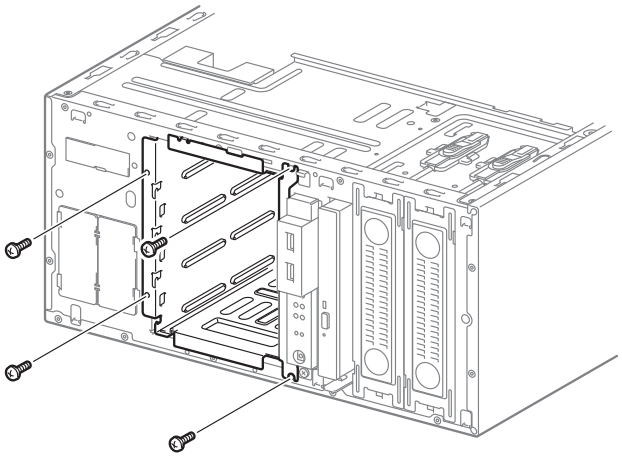
1. See steps 1 to 3 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover and front bezel, see *Chapter 2* (*1.3 Removing the Side Cover* and *1.4 Removing the Front Bezel*).
3. Disconnect the power cable and interface cable from the hard disk drives.
4. Press the part shown in the figure to unlock the HDD tray, and then remove the hard disk drive out from the HDD cage.



1.11.3 Removing the 3.5-inch fixed HDD cage

Remove the 3.5-inch fixed HDD cage from the server by using the following procedure.

1. See steps 1 to 3 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover and front bezel, see *Chapter 2* (*1.3 Removing the Side Cover* and *1.4 Removing the Front Bezel*).
3. To remove the hard disk drives installed in the HDD cage, see *Chapter 2* (*1.11.2 Removing the 3.5-inch fixed hard disk drives*).
4. Disconnect the interface cable from the motherboard or RAID controller.
5. Remove four screws that attach the HDD cage.

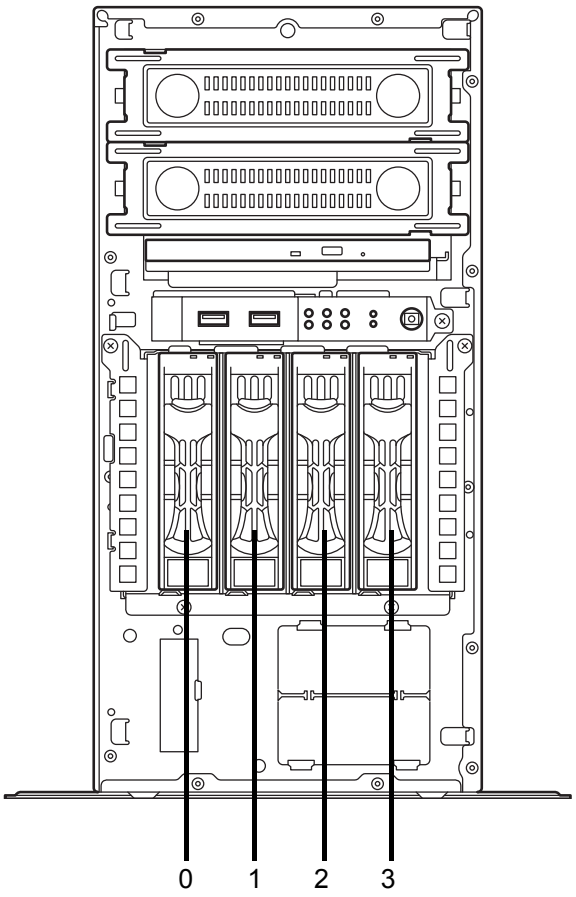


6. Remove the HDD cage from the server.

1.11.4 Installing the 3.5-inch HDD cage and hard disk drives

By installing a 3.5-inch HDD cage, up to four 3.5-inch SATA fixed hard disk drives can be mounted.

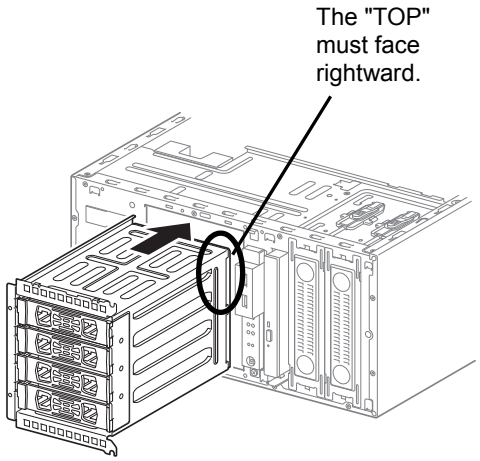
Important **Use hard disk drives provided by NEC.**



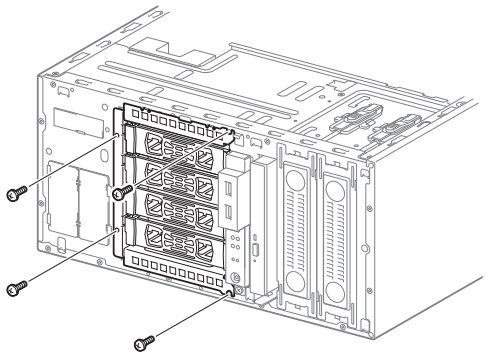
Important **Install the hard disk drives sequentially starting from slot 0.**

Install a 3.5-inch HDD cage and hard disk drives in the server by using the following procedure.

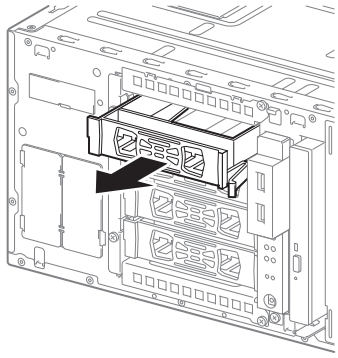
1. See steps 1 to 3 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover and front bezel, see *Chapter 2* (*1.3 Removing the Side Cover* and *1.4 Removing the Front Bezel*).
3. Insert the HDD cage into the HDD bay. The "TOP" must face rightward.



4. Attach the HDD cage by using the four screws.



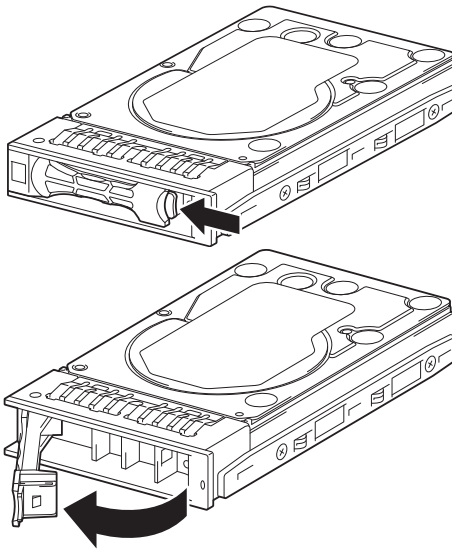
5. Connect the interface cables and power cable to the backplane board installed in the HDD cage. Use the interface cables that come with the HDD cage. For details about cable connection, see *1.15 Connecting Cables*.
6. Reassemble the server.
7. Remove the dummy tray from the HDD cage.



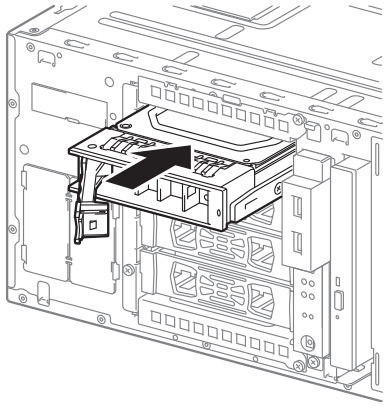
Important

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

8. Unlock the handle in the tray for a hard disk drive.



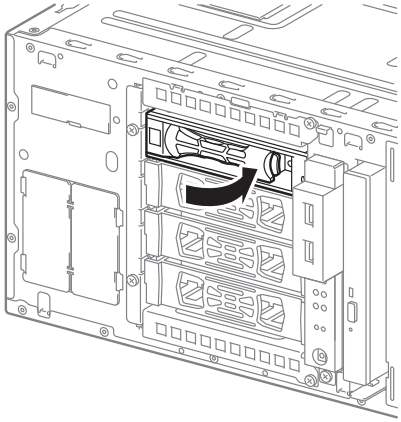
9. Hold the tray firmly and insert it in the slot.



Note

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

10. Gently close the handle until it clicks, indicating that it is locked.



Note

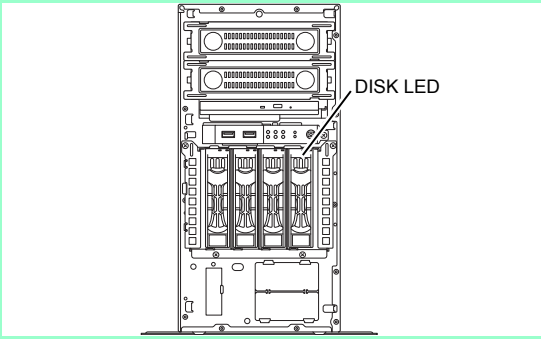
When you push the drive into the slot, confirm the handle got hooked on the frame.

1.11.5 Removing the 3.5-inch hard disk drives

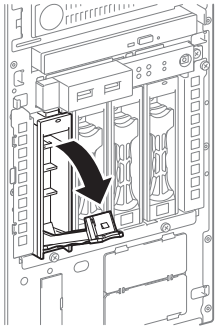
Remove the 3.5-inch hard disk drives from the HDD cage by using the following procedure.

Important **When disposing of the hard disk drives, follow the instructions described in *Chapter 1* (*1.5 Transfer, movement, and disposal*) in *Safety Precautions and Regulatory Notices*.**

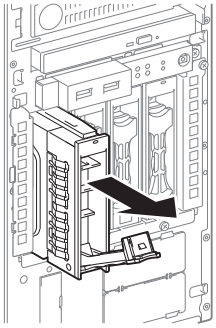
Note If you remove a disk due to a hard disk drive failure, check the slot with its DISK LED lit in amber.



1. To remove the front bezel, see *Chapter 2* (*1.4 Removing the Front Bezel*).
2. Release the lock lever and open the handle.



3. Hold the tray firmly and pull it toward the front.



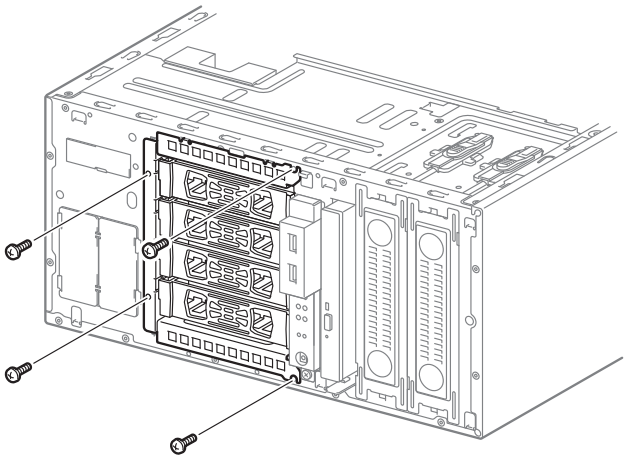
Note Do not pull the handle to remove the hard disk drive.
Doing so may damage the handle.

Important **Do not use this server while removing the hard disk drive.**

1.11.6 Removing the 3.5-inch HDD cage

Remove the 3.5-inch HDD cage from the server by using the following procedure.

1. See steps 1 to 3 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover and front bezel, see *Chapter 2* (*1.3 Removing the Side Cover* and *1.4 Removing the Front Bezel*).
3. To remove the hard disk drives installed in the HDD cage, see *Chapter 2* (*1.11.5 Removing the 3.5-inch hard disk drives*).
4. Disconnect the interface cable and power cable from the backplane installed in the HDD cage.
5. Disconnect the interface cable from the motherboard or RAID controller.
6. Remove four screws that attach the HDD cage.



7. Remove the HDD cage from the server.

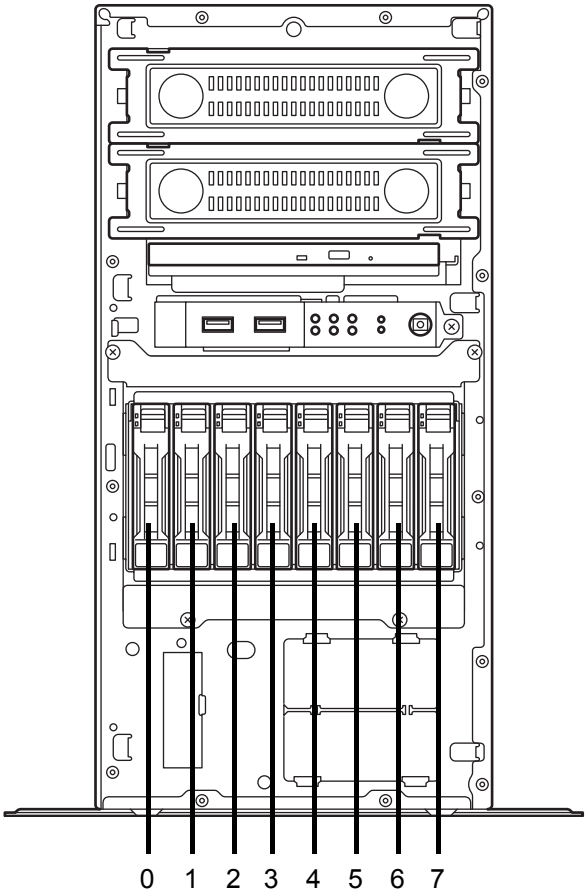
1.11.7 Installing the 2.5-inch HDD cage and hard disk drives

By installing a 2.5-inch HDD cage, up to eight 2.5-inch SAS/SATA hard disk drives or solid state drives (SSD) can be mounted.

Combining SATA/SAS hard disk drives and SSDs

- An optional RAID controller is required to use SAS hard disk drives together with SSDs.
- An optional RAID controller is required to install five or more hard disk drives.
- You cannot mix them within the same RAID array.
- You cannot use SAS hard disk drives that have different rotation speeds within the same RAID array.
- Mount SATA/SAS hard disk drives in order from slot 0, and mount the SSDs to the remaining slots.

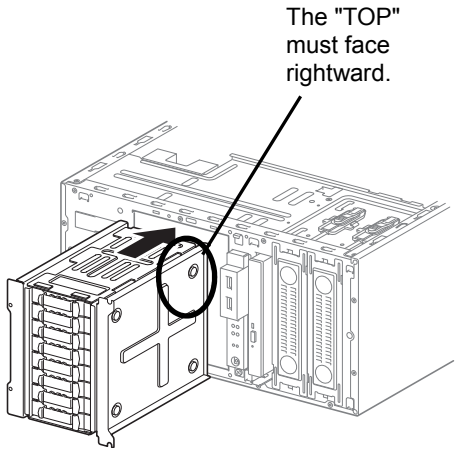
Important **Use hard disk drives provided by NEC.**



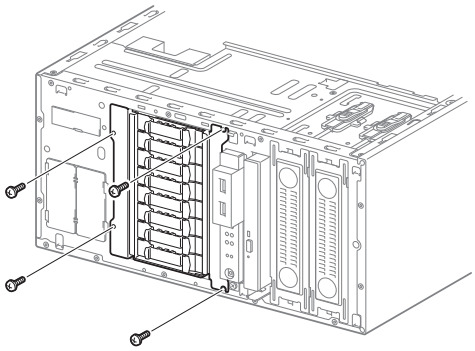
Important **Install the hard disk drives sequentially starting from slot 0.**

Install a 2.5-inch HDD cage and hard disk drives in the server by using the following procedure.

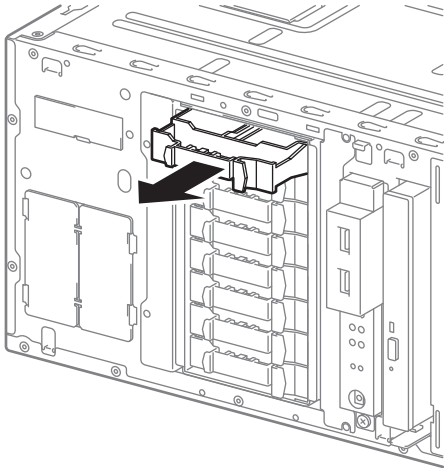
1. See steps 1 to 3 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover and front bezel, see *Chapter 2* (*1.3 Removing the Side Cover* and *1.4 Removing the Front Bezel*).
3. Insert the HDD cage into the HDD bay. The "TOP" must face rightward.



4. Attach the HDD cage by using the four screws.



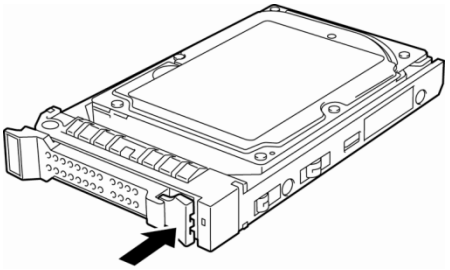
5. Connect the interface cables and power cable to the backplane board installed in the HDD cage. Use the interface cables that come with the HDD cage. For details about cable connection, see *1.15 Connecting Cables*.
6. Reassemble the server.
7. Remove the dummy tray from the HDD cage.

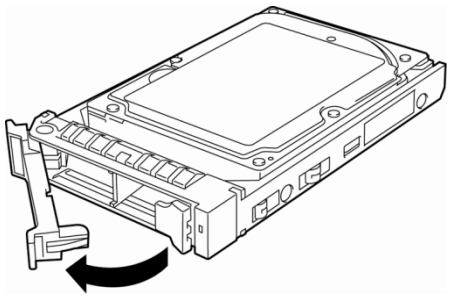


Important

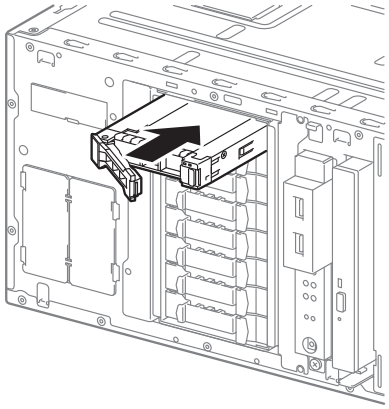
- **Keep the dummy trays for future use.**
- **Keep the dummy trays installed in slots where hard disk drives are not installed.**

8. Unlock the handle in the tray for a hard disk drive.





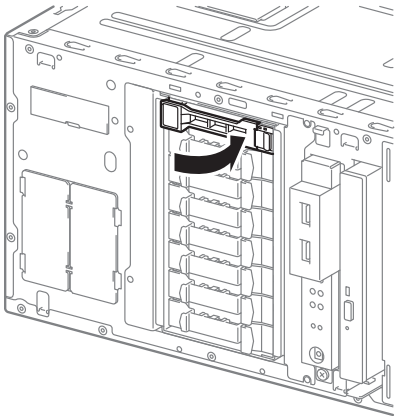
9. Hold the tray firmly and insert it in the slot.



Note

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

10. Gently close the handle until it clicks, indicating that it is locked.



Note

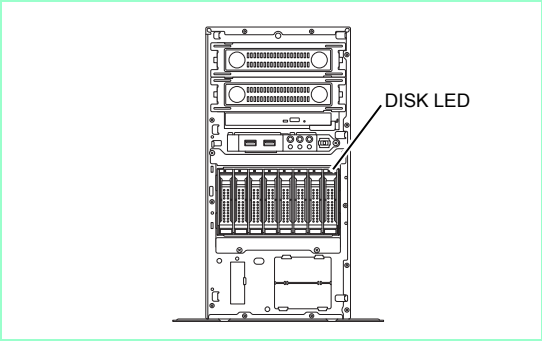
When you push the drive into the slot, confirm the handle got hooked on the frame.

1.11.8 Removing the 2.5-inch hard disk drives

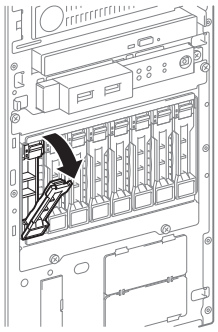
Remove the 2.5-inch hard disk drives from the HDD cage by using the following procedure.

Important **When disposing of the hard disk drives, follow the instructions described in *Chapter 1* (*1.5 Transfer, movement, and disposal*) in *Safety Precautions and Regulatory Notices*.**

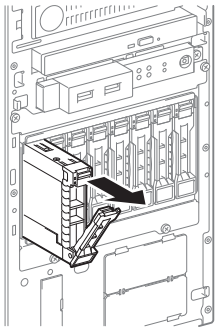
Note If you remove a disk due to a hard disk drive failure, check the slot with its DISK LED lit in amber.



1. To remove the front bezel, see *Chapter 2* (*1.4 Removing the Front Bezel*).
2. Release the lock lever and open the handle.



3. Hold the tray firmly and pull it toward the front.



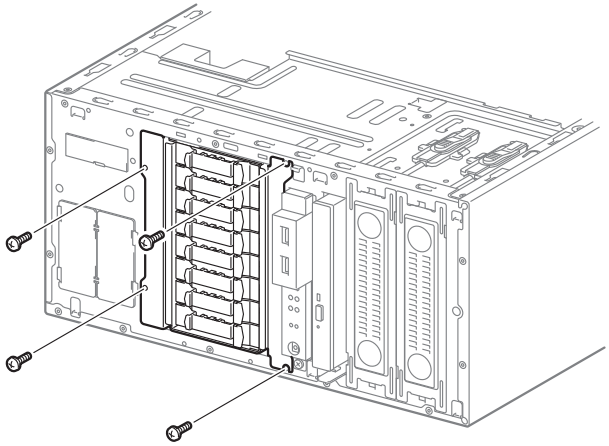
Note Do not pull the handle to remove the hard disk drive.
Doing so may damage the handle.

Important **Do not use this server while removing the hard disk drive.**

1.11.9 Removing the 2.5-inch HDD cage

Remove the 2.5-inch HDD cage from the server by using the following procedure.

1. See steps 1 to 3 in *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover and front bezel, see *Chapter 2* (*1.3 Removing the Side Cover* and *1.4 Removing the Front Bezel*).
3. To remove the hard disk drives installed in the HDD cage, see *Chapter 2* (*1.11.8 Removing the 2.5-inch hard disk drives*).
4. Disconnect the interface cable and power cable from the backplane installed in the HDD cage.
5. Disconnect the interface cable from the motherboard or RAID controller.
6. Remove four screws that attach the HDD cage.



7. Remove the HDD cage from the server.

1.12 Optical Disk Drive

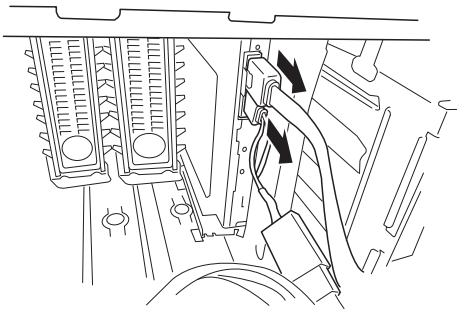
Procedures for replacing the standard optical disk drive with the optional internal DVD SuperMULTI drive are described below.

Important **Do not install a drive manufactured by a third party.**

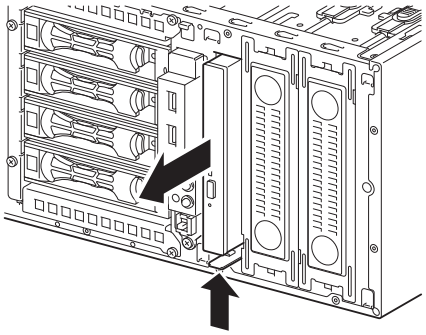
1.12.1 Replacing drives

Follow the procedure below to replace your drive with the optional internal DVD SuperMULTI drive.

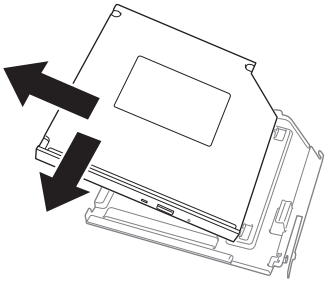
1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover and front bezel, see *Chapter 2 (1.3 Removing the Side Cover* and *1.4 Removing the Front Bezel)*.
3. Remove the duct. If a device is installed in the 5.25-inch expansion bay 1, remove it so that you can access the cable connected to the optical disk drive.
4. Disconnect the SATA cable and DC power cable from the optical disk drive.



5. Push the stopper on the right side and remove the optical disk drive.



6. Remove the bracket from the optical disk drive.



7. Mount the bracket for the optical disk drive on the DVD SuperMULTI drive.
8. Install the bracket with DVD SuperMULTI drive installed to the server.
9. Connect the SATA cable and DC power cable you disconnected in step 4 to the server.

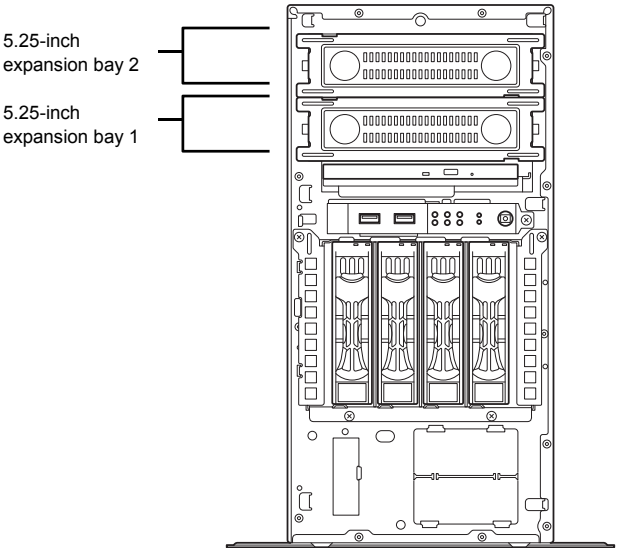
This completes the installation procedures.

1.12.2 Removal

You can remove the optical disk drive by reversing the installation procedure.

1.13 Backup Devices

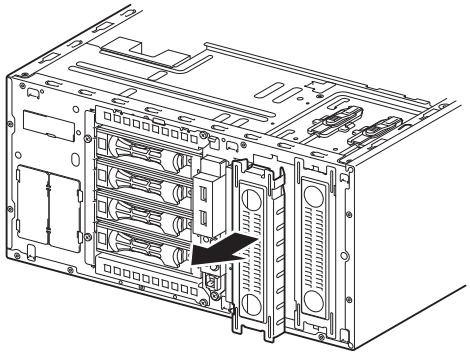
The 5.25-inch expansion bay of the server can contain a backup device such as a magnetic tape drive.



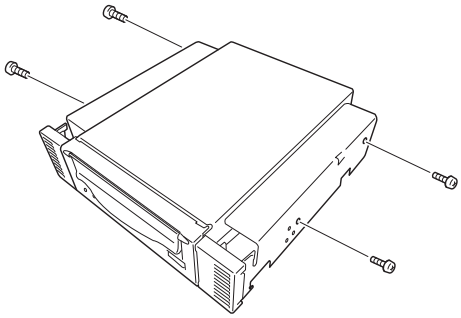
1.13.1 Installation

Install a backup device by using the following procedure.

1. See *Chapter 2 (1.2 Overview of Installation and Removal)* for preparations.
2. To remove the side cover and front bezel, see *Chapter 2 (1.3 Removing the Side Cover* and *1.4 Removing the Front Bezel)*.
3. Remove the blank cover from the front bezel and the server.



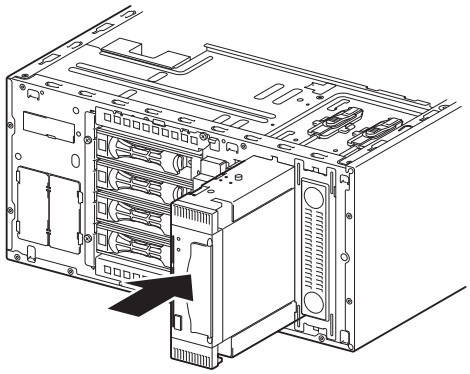
4. Secure the backup device on the left and right sides by using the four screws that come with the server.



Important **Use screws supplied with this server to attach the backup device to the tray.**

5. Insert the backup device into chassis.

   Do not push the backup device in completely as the cable has to be connected to the device.



6. Connect the interface cable and power cable to the installed 3.5-inch backup device.

   For more information, see *Chapter 2* (*1.15 Connecting Cables)*.

7. Push the device all the way until it clicks, indicating that it is locked.

Note

Arrange the unused power supply cable at the rear of the backup device so that this cable comes between the HDD cage and optical disk drive. Be careful not to apply a force to the I/F cable connector when pushing in the backup device.

8. Assemble the server.
9. Install device drivers for installed backup device as needed.

   For more information, refer to the manual provided with the backup device.

1.13.2 Removal

You can remove the backup device by reversing the installation procedure. If the devices are to remain removed, attach the stored dummy cover.

1.14 Supporting High-temperature Environment

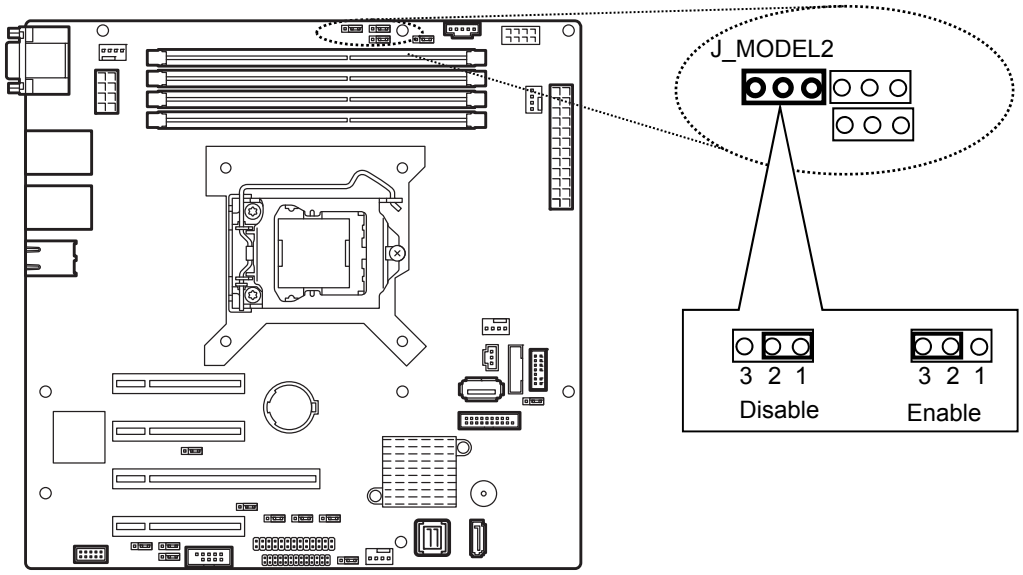
The high-temperature environment setting of this server enables you to use this server under the environment of 5°C to 48°C.

For the high-temperature environment setting, the following configuration is required.

- SDR is the dedicated setting.
- When the non-redundant power supply unit is installed, N8181-132F or N8181-178 Power Supply Fan*1 is required.
- The backup device is not available.

*1 Power Supply Fan type depends on the power supply type.

To make a high-temperature environment, change the jumper switch on motherboard as shown below.



Motherboard

1.15 Connecting Cables

This section shows an example of internal device cable connection.

1.15.1 Internal interface cables

This section describes the connection of internal interface cables.

Tips The figure shown here primarily describes connections. For more information about the connectors on the motherboard, see *Chapter 1 (4.4 Motherboard)*.

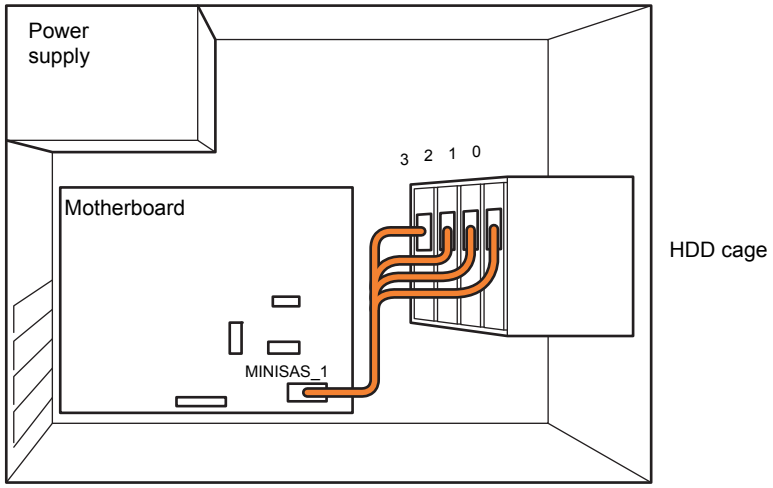
(1) Connecting hard disk drives

This section describes how to connect additional hard disk drives.

(a) Using 3.5-inch fixed hard disk drives

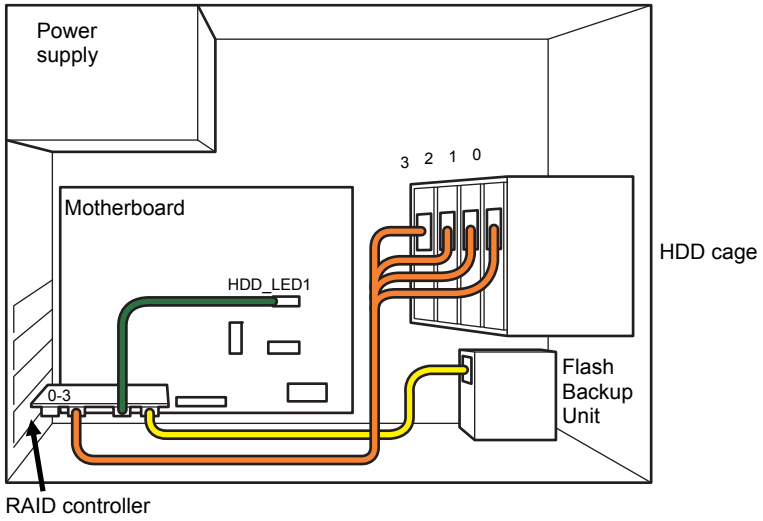
Connect the cables as shown in the following figure. Install the hard disk drives in order from the left side.

- Connecting to the miniSAS connector on the motherboard



You can use the controller on the motherboard to build a RAID system. For more information, see Chapter 2 (*5. RAID System Configuration*) in "*Maintenance Guide*".

- Adding a RAID controller (N8103-176/177/178/188)



miniSAS cable
Flash back up unit control cable (only when the RAID controller is N8103-176/177/178)
LED cable

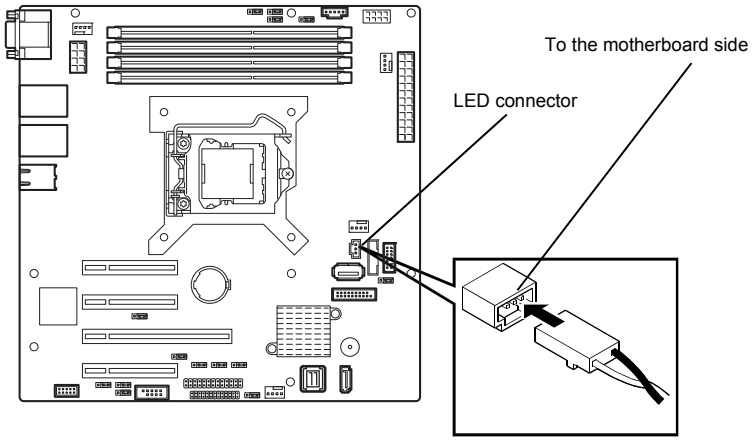
* N8103-180 cannot be installed to N8103-188.

Tips The dedicated cable K410-293(00) is required for installing the RAID controller (N8103-176/177/178/188) in the server.

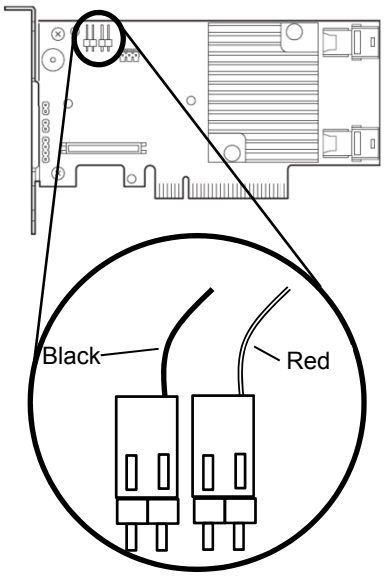
- **About RAID LED cables**

The Global HDD LED on the front of the equipment shows the access status of hard disk drives that are connected to a RAID controller. To display this status, connect the LED cable that comes with the optional cable K410-293(00).
Connect the LED connector on the motherboard to the connector on the RAID controller.

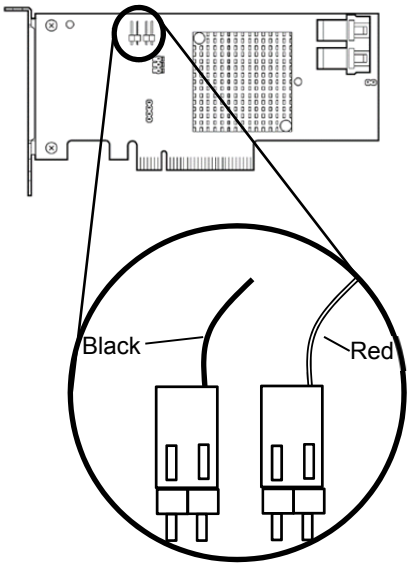
See the figures below and connect the LED cable to the LED connector of the motherboard.



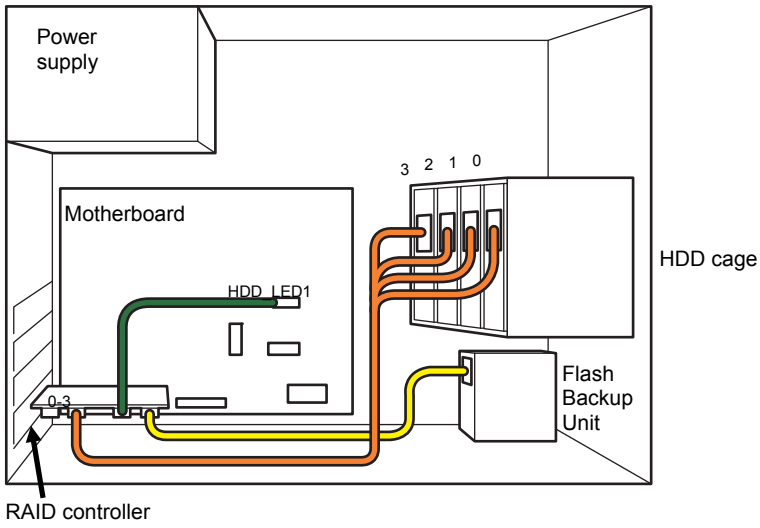
RAID Controller N8103-176/177/178



RAID Controller N8103-188



- Adding a RAID controller (N8103-205/206/207/208/210/211)



miniSAS cable
Flash back up unit control cable (only when the RAID controller is N8103-206/207/208)
LED cable

* N8103-209 cannot be installed to N8103-205/210/211.

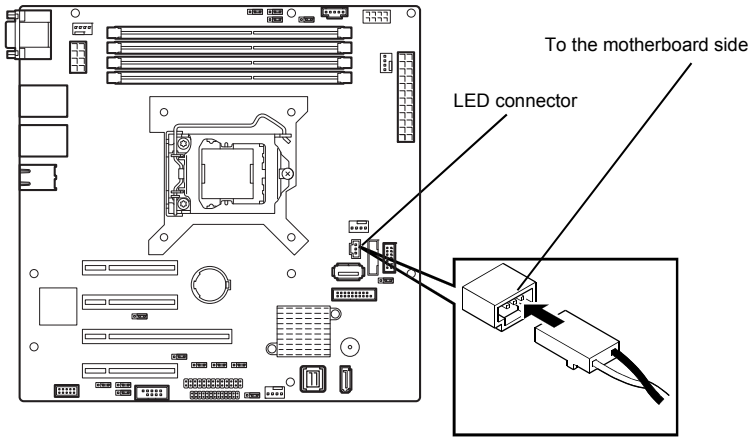
Tips The dedicated cable K410-444(00) is required for installing the RAID controller (N8103-205/206/207/208/210/211) in the server.

- **About RAID LED cables**

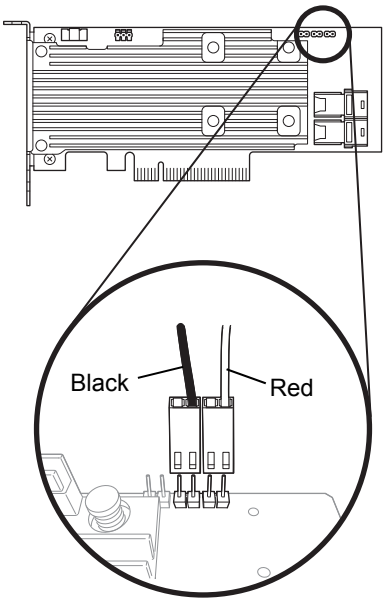
The Global HDD LED on the front of the equipment shows the access status of hard disk drives that are connected to a RAID controller. To display this status, connect the LED cable that comes with the optional cable K410-444(00).

Connect the LED connector on the motherboard to the connector on the RAID controller.

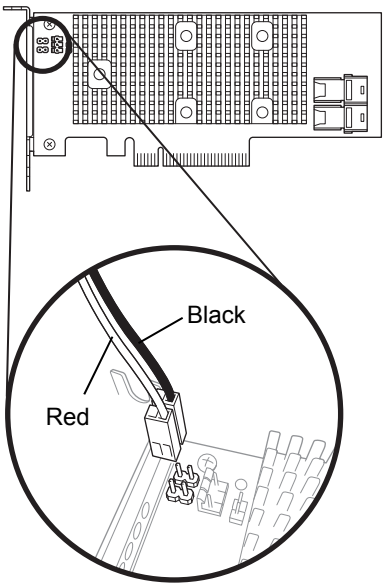
See the figures below and connect the LED cable to the LED connector of the motherboard.



RAID Controller N8103-206/207/208/210/211



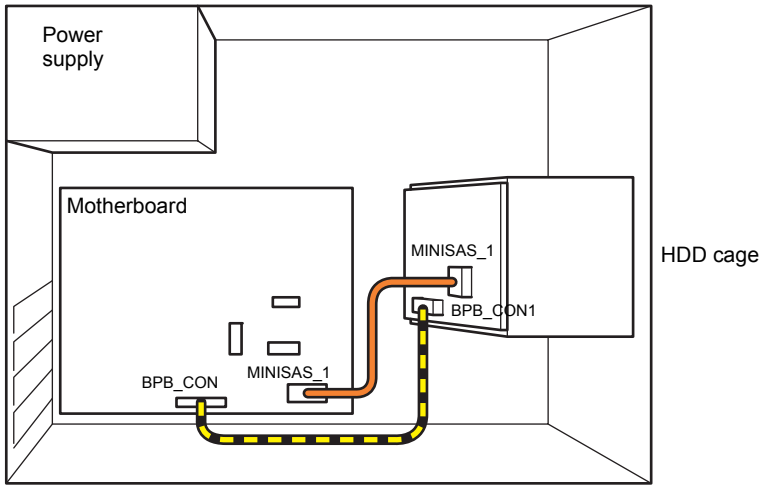
RAID Controller N8103-205



(b) Using 3.5-inch HDD cage

Connect the cables as shown in the following figure. Install the hard disk drives in order from the left side.

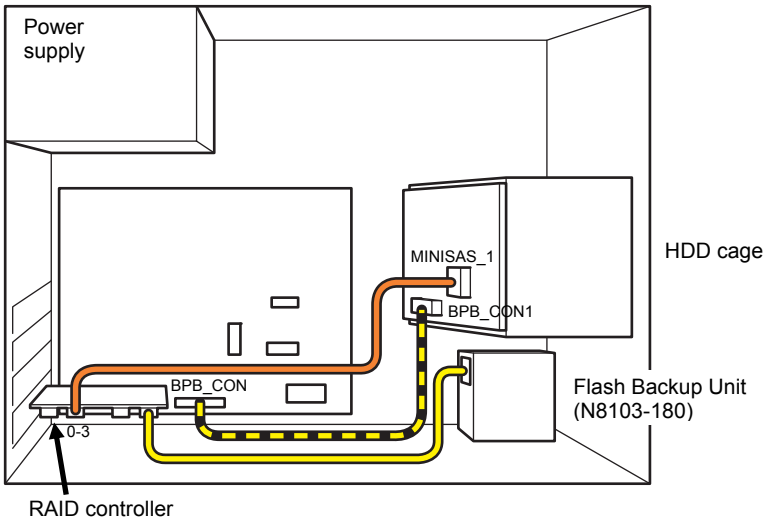
- Connecting to the miniSAS connector on the motherboard



miniSAS cable
HDD backplane interface cable

You can use the controller on the motherboard to build a RAID system. For more information, see *Chapter 2* (*5. RAID System Configuration*) in "*Maintenance Guide*".

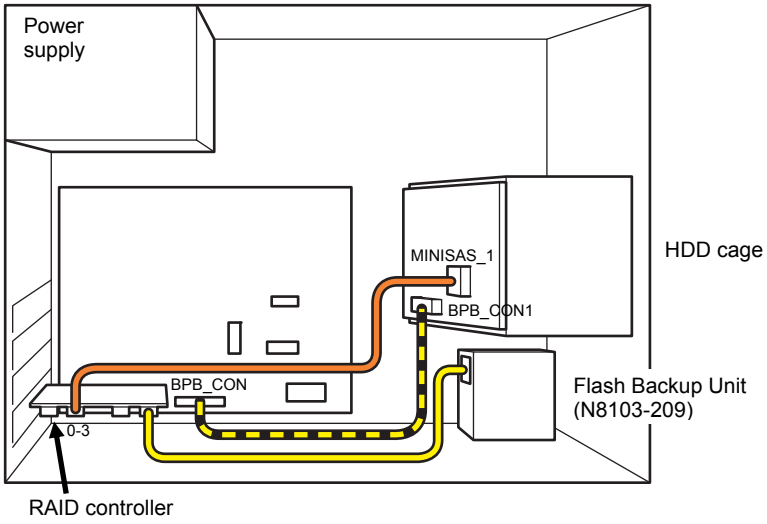
- Adding a RAID controller (N8103-176/177/178/188)



miniSAS cable
HDD backplane interface cable
FBU cable

* N8103-180 cannot be installed to N8103-188.

- Adding a RAID controller (N8103-205/206/207/208/210/211)



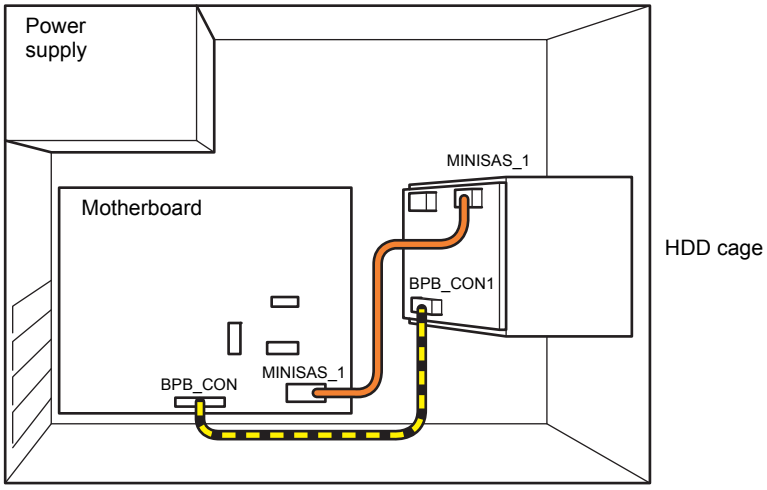
miniSAS cable
HDD backplane interface cable
FBU cable

* N8103-209 cannot be installed to N8103-205/210/211.

(c) Using 2.5-inch HDD cage

Connect the cables as shown in the following figure. Install the hard disk drives in order from the left side.

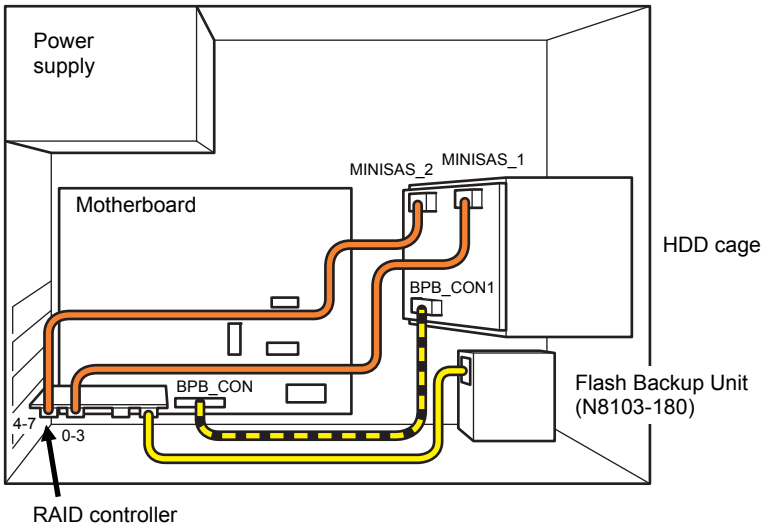
- Connecting one to four hard disk drives to the miniSAS connector on the motherboard



miniSAS cable
HDD backplane interface cable

You can use the controller on the motherboard to build a RAID system. For more information, see *Chapter 2* (*5. RAID System Configuration*) in "*Maintenance Guide*".

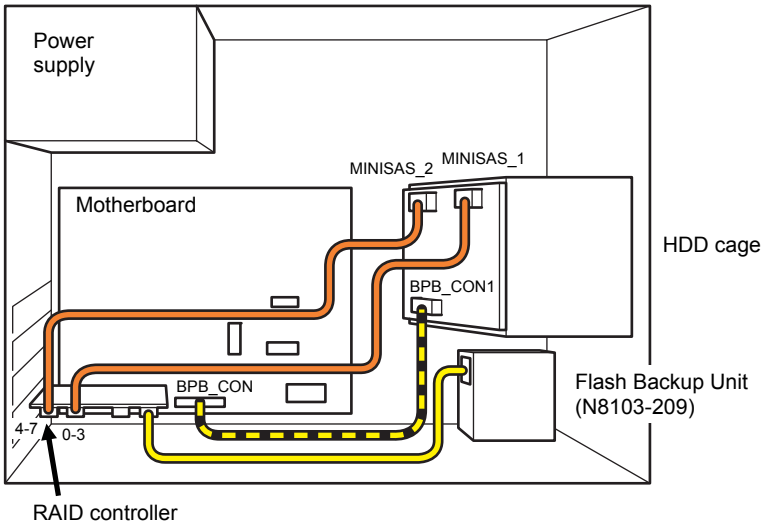
- Adding one to eight hard disk drives with a RAID controller (N8103-176/177/178/188)
  An optional SAS/SATA cable (K410-340(00)) is required when installing five or more hard disk drives.



miniSAS cable
HDD backplane interface cable
FBU cable

* N8103-180 cannot be installed to N8103-188.

- Adding one to eight hard disk drives with a RAID controller (N8103-205/206/207/208/210/211).
  An optional SAS/SATA cable (K410-340(00)) is required when installing five or more hard disk drives.



miniSAS cable
HDD backplane interface cable
FBU cable

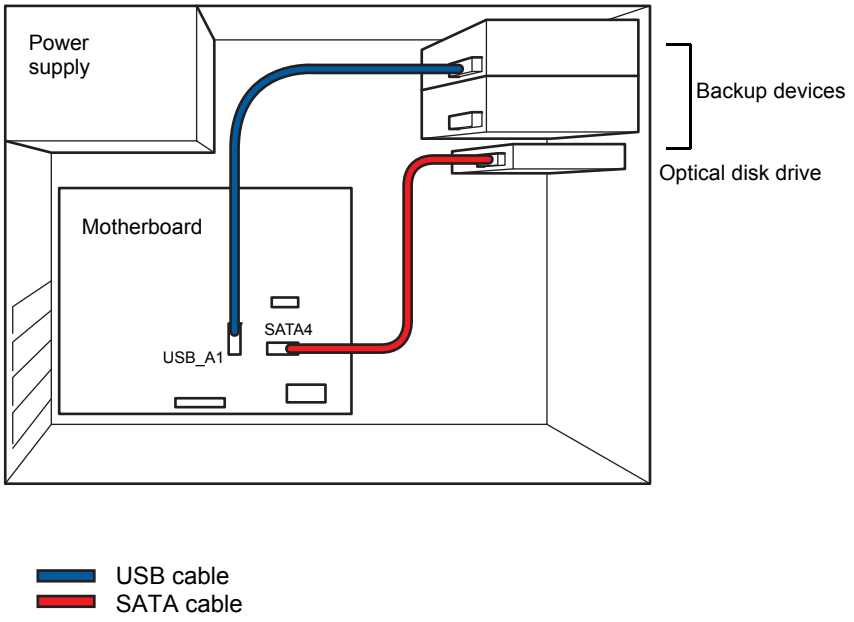
* N8103-209 cannot be installed to N8103-205/210/211.

(2) Connecting backup devices

The 5.25-inch expansion bay of the server can mount USB devices for internal connection.

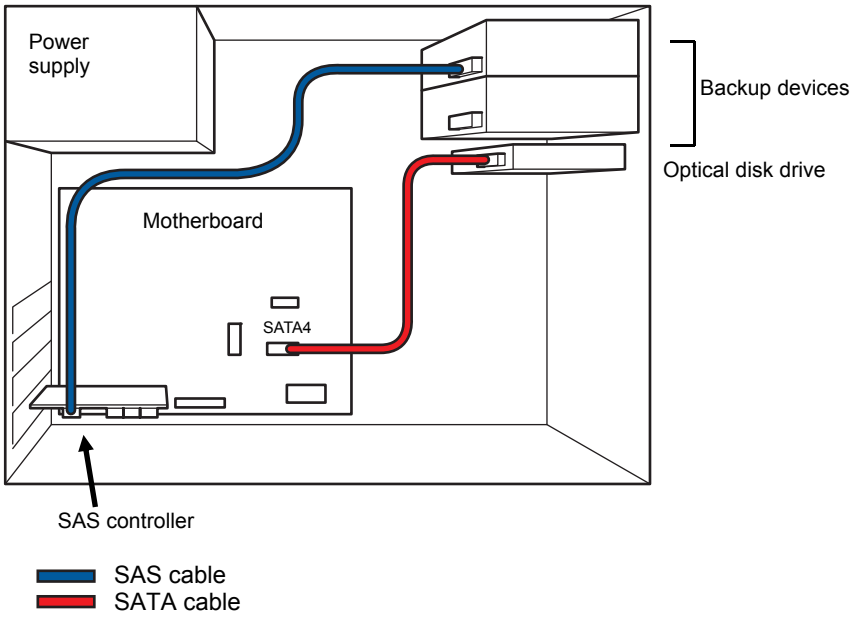
(a) Mounting an internal USB device

Use the dedicated internal USB cable (K410-276(00)).



(b) Mounting a SAS device

Use the dedicated internal SAS cable (K410-217(00)).

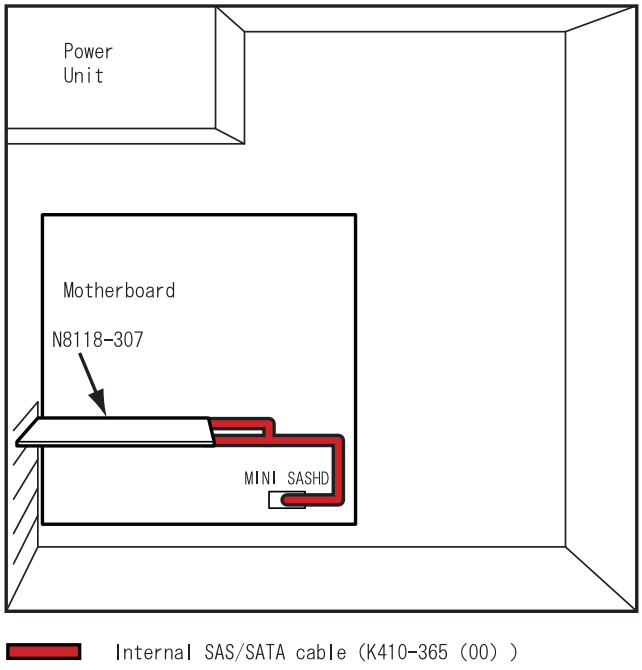


(3) Connecting Dual M.2 SATA mount kit (N8118-307)

The server can mount dual M.2 SATA mount kit (N811-307) on PCI slot. The dual M.2 SATA mount kit has 2 slot that can mount 120GB M.2 SATA SSD(N8150-736).

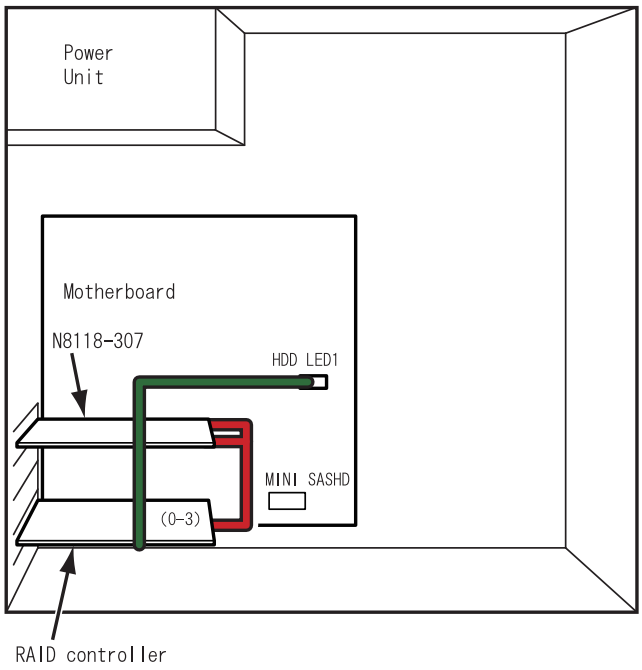
(a) When SSD is used in software RAID

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



(b) When SSD is used in hardware RAID

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



Internal SAS/SATA cable (K410-365 (00))

RAID LED cable (K410-293(00)): When using the RAID controller (N8103-176/177/188)
RAID LED cable (K410-444(00)): When using the RAID controller (N8103-205/206/210)

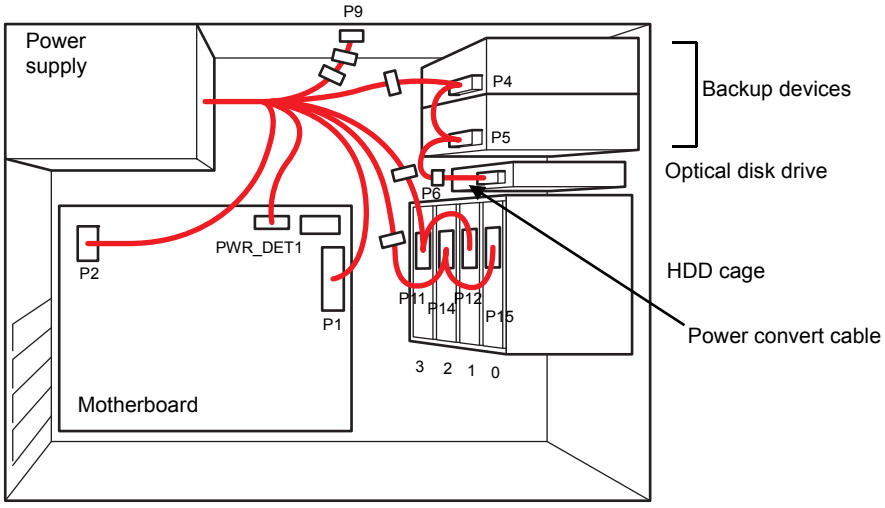
Note M.2 SATA SSD and hard disc drive cannot be connected to the same RAID controller.

1.15.2 Power cables

The figure below shows an example of connecting the power cables. Power cables other than those shown here are not used by the devices.

(1) Non-Redundant Power Supply Model (EXP334)

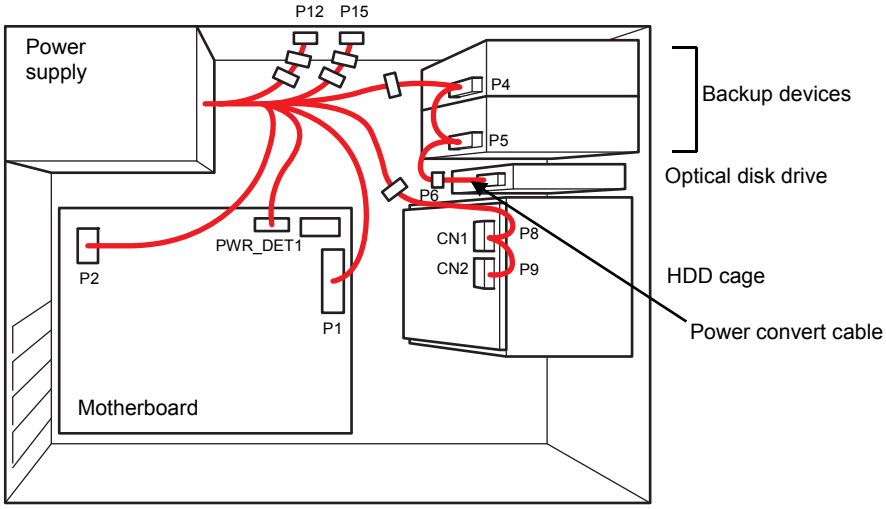
(a) Using 3.5-inch fixed HDD cage



Cable connected to power supply

Unused power supply cable connector

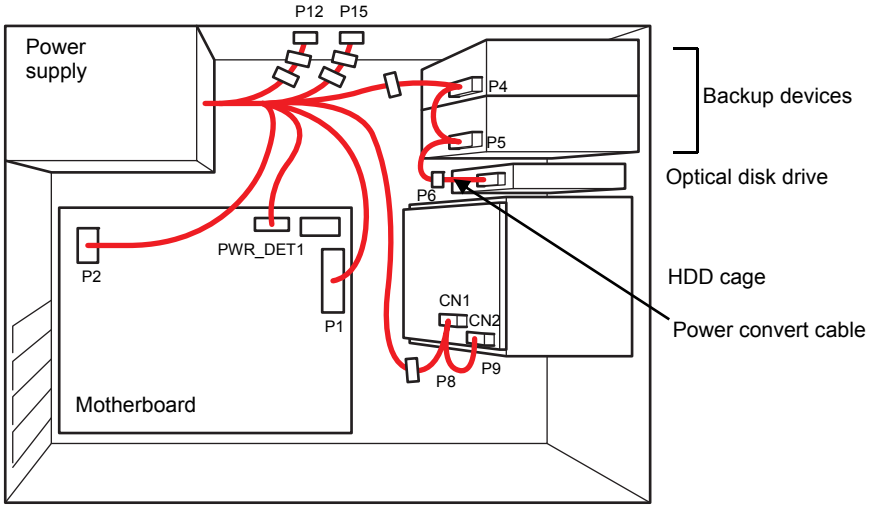
(b) Using 3.5-inch HDD cage



Cable connected to power supply

Unused power supply cable connector

(c) Using 2.5-inch HDD cage

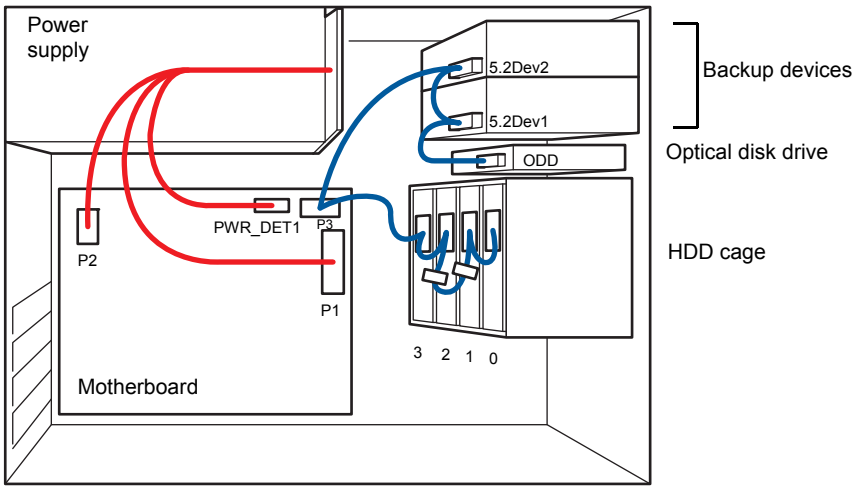


Cable connected to power supply

Unused power supply cable connector

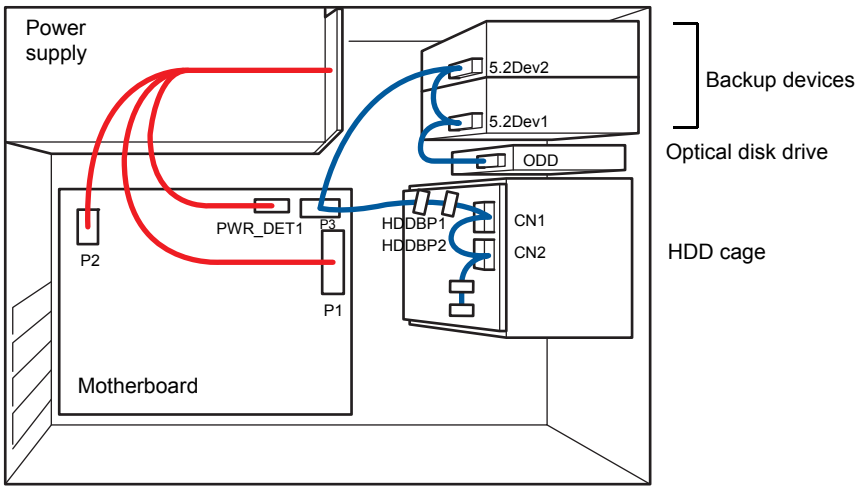
(2) Redundant Power Supply Model (EXP334A)

(a) Using 3.5-inch fixed HDD cage



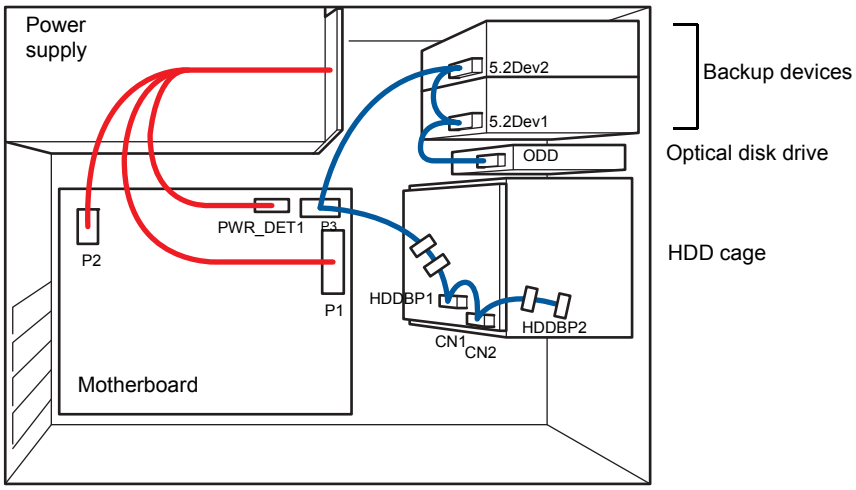
Cable connected to power supply backplane
DC cable
Unused power supply cable connector

(b) Using 3.5-inch HDD cage



Cable connected to power supply backplane
DC cable
Unused power supply cable connector

(c) Using 2.5-inch HDD cage



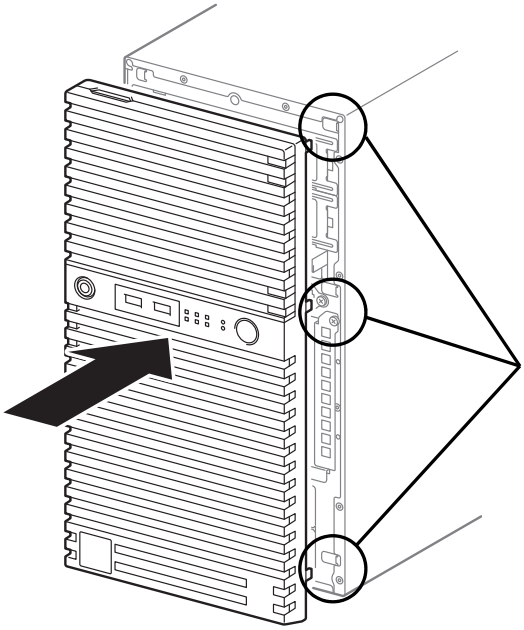
Cable connected to power supply backplane

DC cable

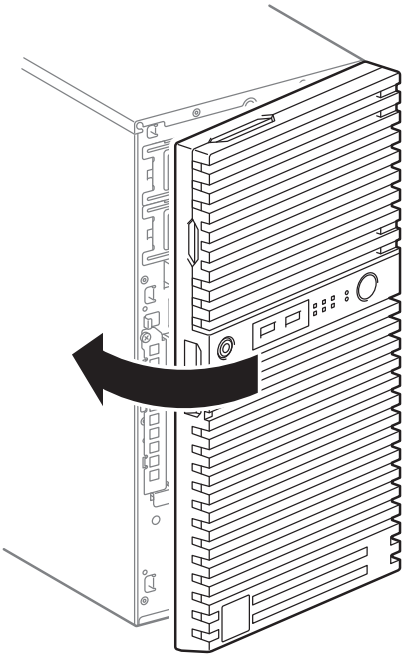
Unused power supply cable connector

1.16 Attaching the Front Bezel

You can attach the front bezel by reversing the removal procedure. Attach the front bezel to the server by inserting the three tabs on the inside of the front bezel into the slits on the right-front of the server and then pressing the left side of the front bezel to secure it into place on the front of the server.



Insert tabs inside the bezel into the slit on the chassis.



1.17 Installing the Side Cover

You can attach the side cover by reversing the removal procedure.

Make sure that hooks at both the top and bottom of the side cover are securely inserted in the slits on the server frame. Also make sure that the hooks at the front of the cover are engaged with the server frame when sliding the side cover forward to attach. If they are not engaged with the frame, the cover cannot be secured in place.

2. Installation and Connection

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

2.1 Installation

WARNING

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

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

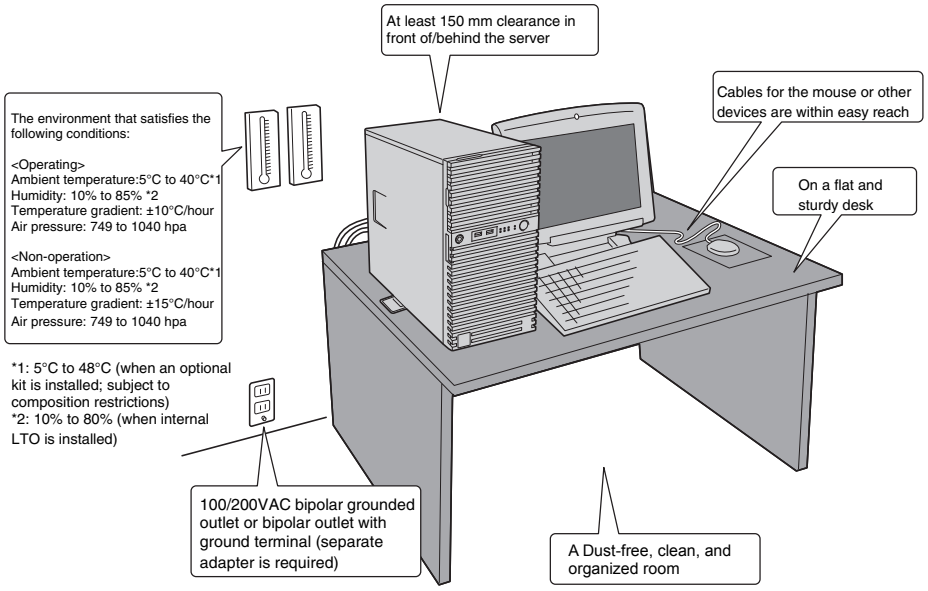
CAUTION

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

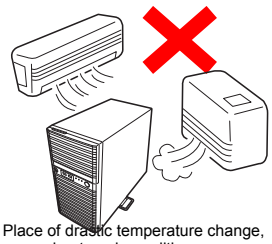
- **Do not attempt to lift the server by gripping the front bezel.**
- **Do not carry or install the server only by a single person.**
- **Install and store only in the specified environment.**

The environment suitable for the server is as follows.

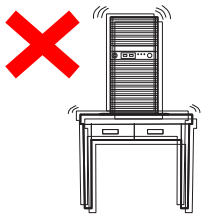
Hold the server firmly, and slowly and gently place it in the position in which it is to be installed.



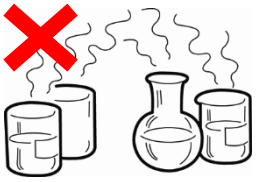
Do not install the server in an environment in which any of the following conditions apply: Installing the server in any of the following conditions will cause the server to malfunction.



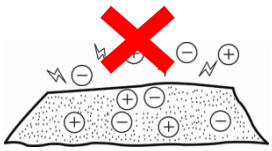
Place of drastic temperature change, near a heater, air conditioner, or refrigerator.



Place where intense vibration may be generated.



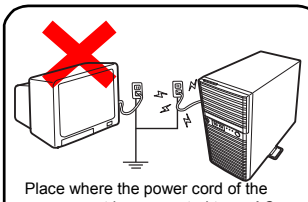
Places where corrosive gas is present, such as environments where there is sulfur vapor in the atmosphere, or places where chemicals are nearby or may be accidentally sprayed over.



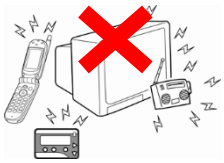
Place where a carpet not subject to anti-static process is laid.

Place where some objects may be fallen.

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



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



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

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

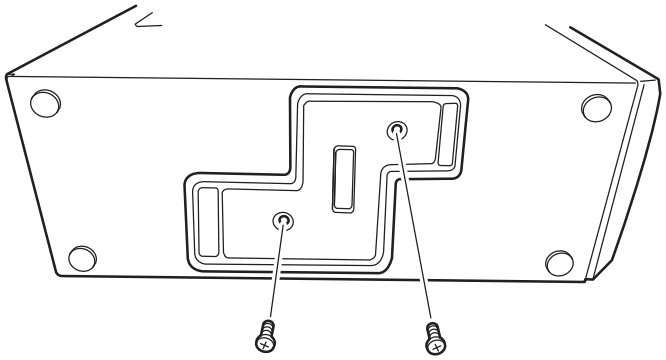
2.1.1 Preparation for installation

Remove the stabilizer attached to the bottom of the server, and then change as instructed below.

Removing/installing the stabilizer

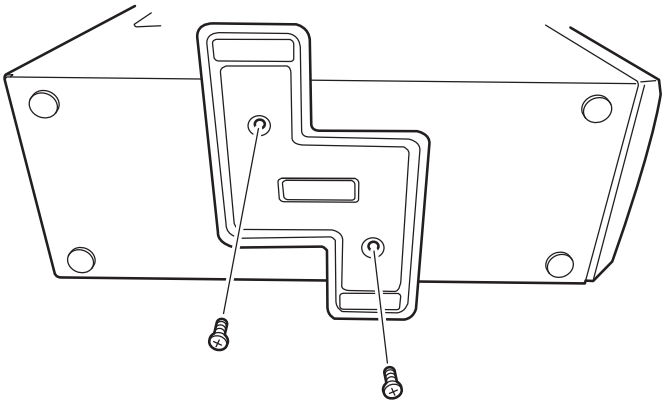
Removing the stabilizer

Remove the two screws from the stabilizer to remove the stabilizer from the server.

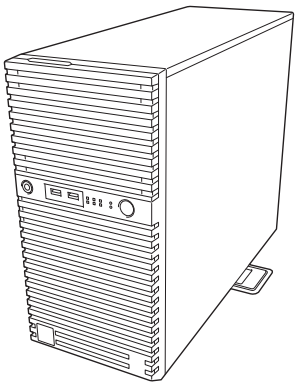


Installing the stabilizer

Turn the stabilizer 90 degree as shown in the figure below, and then fix it by using the two screws.



After attaching the stabilizers, set up the server as shown in the image.



2.2 Connection

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

WARNING

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

- **Do not hold the power plug with wet hands.**

CAUTION

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

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

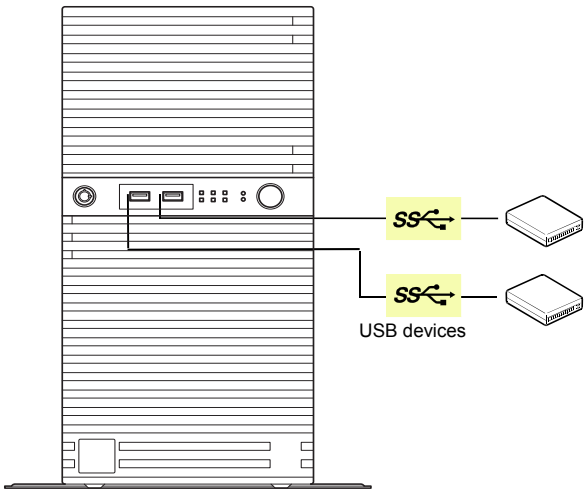
2.2.1 Interface cables

Connect the interface cable before connecting the power cord.

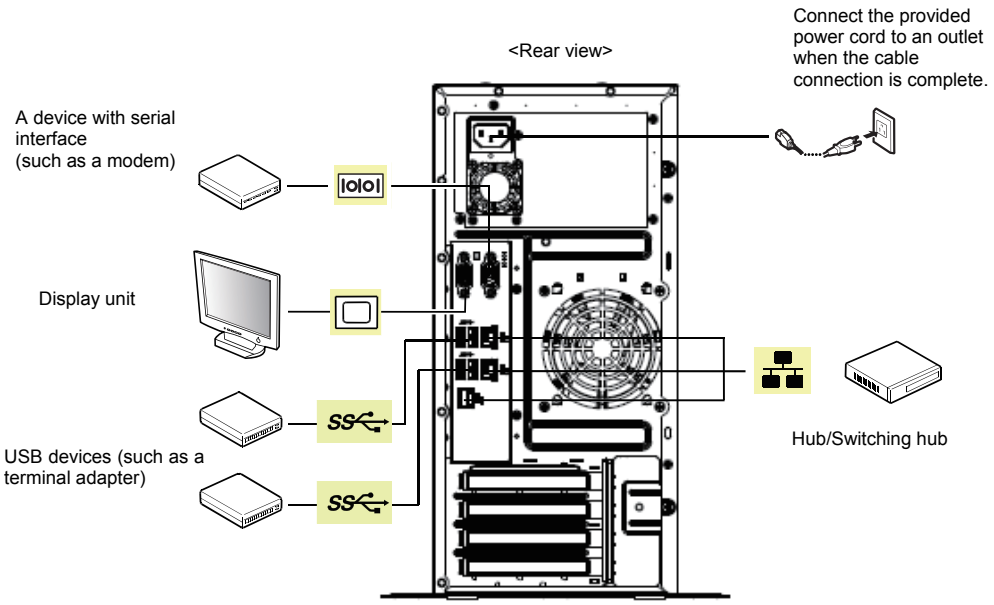
Important

- **Turn off the server and peripheral devices to be connected before connecting.**
- **If you use the third party display or peripheral devices, and connect the interface cable, contact the dealer to check whether they can be used.**
- **Direct connection from the standard serial port of this sever to the dedicated network line is disabled. To connect to the dedicated line, be sure to connect from the terminal device approved by the Telecommunications Business Act (the dedicated line means the dedicated transmission path installed by the specified users and its accessories. Generally-used public line is also included.)**
- **The connectors that are not explained here are not available. Do not connect anything to the connectors.**

<Front view>



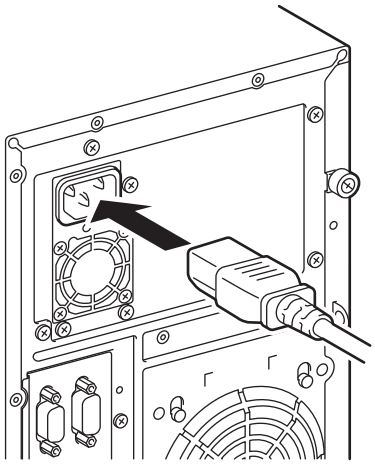
<Rear view>



2.2.2 Power cord

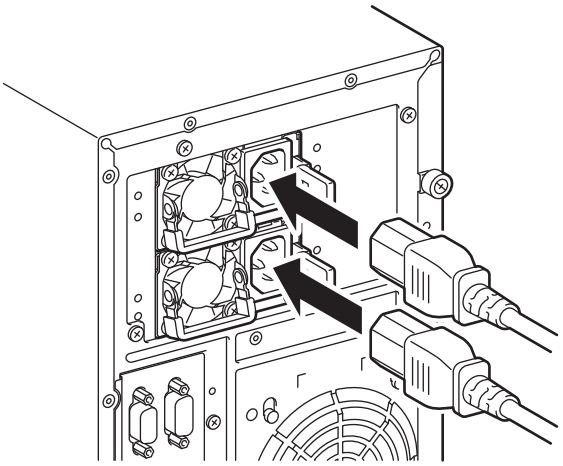
Connect the provided power cord to the server.

Non-Redundant Power Supply Model (EXP334)



Note Appearance of the power supply unit varies depending on the model number.

Redundant Power Supply Model (EXP334A)



When the power cord is connected to an outlet, POWER LED lights amber during initialization of the system.

Tips

- To connect the power cord to a UPS, connect it to the outlet provided at the rear of the UPS.
  For details, refer to the instruction manual supplied with the UPS
- In order to link the power supply from the UPS with the power-on/off of this server, the BIOS settings change might be required depending on the UPS to which the power cord of this server is connected.
  In the BIOS Setup Utility, select **Server**, and then **AC-LINK** to change the parameter to the appropriate value.

NEC Express5800 Series
Express5800/T110i

3 Setup

This chapter describes how to set up the server.

1. **Turning on the Server**
   Power-On Self-Test (POST) is explained in this section.

2. **System BIOS Setup**
   You can customize BIOS settings by following the instructions in this section.

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

4. **EXPRESSBUILDER**
   EXPRESSBUILDER helps you to install Windows and maintain the server. See *Chapter 2 (6. Details of EXPRESSBUILDER)* in *Maintenance Guide*.

5. **Installing Software Components**
   You can install Windows and bundled software by following the instructions in *Installation Guide (Windows)*.

6. **Turning off the Server**
   Turn off power when not using the server.

1. Turning on the Server

Turn on the server by using the following procedure.

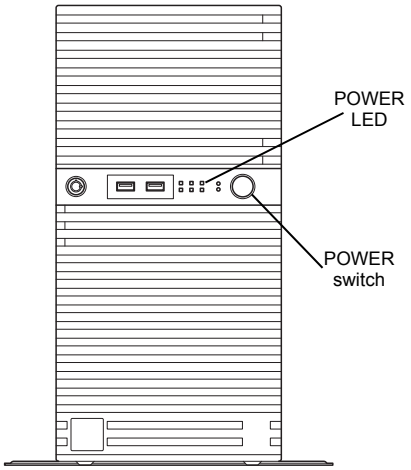
Important **Wait for at least 30 seconds before turning on the server again after the power has been turned off.**

1. Disconnect Flash FDD if applicable.
2. Turn on the peripheral devices such as 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.

3. If STATUS LED1,2 lights green/amber, wait until STATUS LED is unlit.

4. Press POWER Switch at the front of the server.
   POWER LED is turned on green and after a while, NEC logo appears on the display.
   While the logo is being displayed, the self-diagnostic program (POST) runs and diagnoses the hardware. For details, see *Chapter 3 (1.1 POST)*.



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

1.1 POST

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

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

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

1.1.1 POST sequence

Explains how POST runs in order.

Note

- Do not perform key input or mouse operation except by the methods indicated in the manual while POST is running,
- Powering on the server, after you installed or removed an optional PCI board or moved it to another slot, may display the message that indicates incorrect board configuration and suspend POST.
  In such a case, press F1 to continue POST. Board configuration can be made using the utility described later.

1. POST runs automatically when the server is turned on.
   NEC logo appears on the screen as factory settings.

Note

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

2. When **Password On Boot** is set to **Enabled** on the **Security** menu in the BIOS setup utility (SETUP), the logo is displayed, and then the password entry is displayed. If you enter the wrong password three times in a row, POST stops and you cannot proceed to the subsequent operation. In this case, turn off and on the server.

Important **Do not set a password until you install the OS.**

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

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

4. POST displays several types of message. These messages let you know that the installed CPU or connected keyboard and mouse are detected.

Tips The value of memory capacity shown in the message may be smaller than the actual physical memory depending on the hardware configuration. This applies to the information in SETUP and system information of the operating system.

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

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

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

You can call the functions below upon completion of POST by pressing the designated function key.

<F2> key: Run the SETUP. For information on the SETUP, see *Chapter 3 (2. System BIOS Setup)*.
<F3> key: Run EXPRESSBUILDER from Internal Flash Memory. For information on EXPRESSBUILDER, see *Chapter 3 (4. EXPRESSBUILDER)*.

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 the offline tool. For information on the offline tool, see *Chapter 1 Maintenance (9. Offline Tools) in "Maintenance Guide"*.
<F12> key: Boot from network.

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

Example: optional RAID controller

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

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

Example: on-board RAID controller

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

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

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

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

7. If you set a password at **SETUP** in the BIOS Setup utility, the password entry appears upon successful completion of POST.
Up to three password entries will be accepted. Three incorrect password entries disable the server to boot. In such a case, turn off the power and wait about ten seconds before turning on to boot the server.

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

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

1.1.2 POST error messages

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

2. System BIOS Setup

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

2.1 Overview

The BIOS Setup Utility (SETUP) is a utility to configure basic hardware settings. This utility is pre-installed in the server as standard.

Usually, you do not need to change the parameters of the SETUP. **Use only when the case applies to any of cases described in *Chapter 3 (2.4 Cases that Require Setting Changes)*.**

2.2 Starting SETUP Utility

Turn on the server and wait until the following message appears. See *Chapter 3 (1.1.1 POST sequence)* for details. (The on-screen message varies depending on the environment.)

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

When you press <F2> key during displaying the message or the NEC logo, SETUP runs and displays the **Main** menu upon completion of POST.

Tips

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

About password entry

The entry of the password appears after you set a password in SETUP.

```
Enter password [                ]
```

If you enter a wrong password three times, SETUP stops. (You cannot operate further.) Turn off the server and try again.

To exit SETUP after saving the parameters, choose **Save & Exit** and then **Save Changes and Exit**.

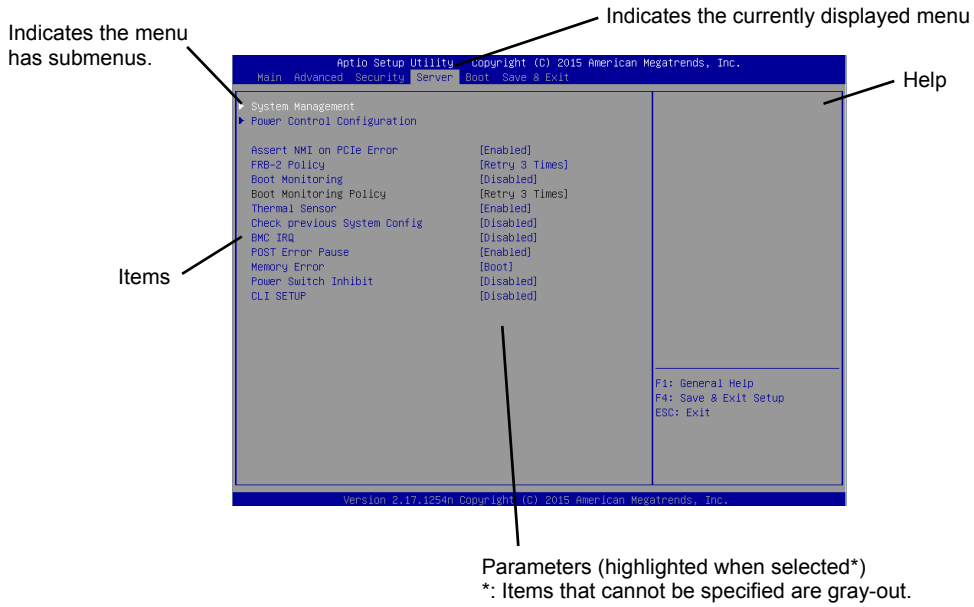
To exit SETUP without saving the parameters, choose **Save & Exit** and then **Discard Changes and Exit**.

Tips

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

2.3 Description on On-Screen Items and Key Usage

This section explains how to use SETUP. Use the keyboard to work with SETUP.



☐ Cursor keys (<↑>, <↓>)
Select an item displayed on the screen. If characters of an item are highlighted, that means the item is currently selected.

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

☐ <–> key/<+> key
Change the parameters of the selected item. You cannot use this key when a menu which has ▶ on the left is selected.

☐ <Enter> key
Press this key to confirm the selected parameter.

☐ <Esc> key
Press this key to return the previous screen. If you choose **Yes** in the following message, SETUP closes without saving the changed parameters.

Quit without saving?
[Yes] No

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

☐ <F2> key
Press this key to restore the parameters. If you choose **Yes** in the following message, the previous parameter(s) are restored.

Load Previous Values?
[Yes] No

☐ <F3> key
Press this key to load default settings. If you choose **Yes** in the following message, the default settings of SETUP are restored. **The default settings are different from the factory settings.** See *Chapter 2 (1. System BIOS)* in "*Maintenance Guide*" for details.

Load Setup Defaults?
[Yes] No

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

☐ <F4> key
Press this key to save parameters. If you choose **Yes** in the following message, the parameters you configured are saved and SETUP closes.

Save configuration and exit?
[Yes] No

2.4 Cases that Require Setting Changes

Specify parameters according to the following table when your system matches "Description". Other than cases described below, do not change the settings. The list of SETUP parameters and factory settings are described in ***Chapter 2 (1. System BIOS)*** **in "*Maintenance Guide*".**

Category	Description	To be changed	Remark
Basic	Change date and time	**Main** → **System Date** **Main** → **System Time**	Configurable on OS
	On/Off NumLock on power ON	**Boot** → **Bootup Numlock State**	
	On/Off the function to display the NEC logo during POST	**Boot** → **Quite Boot** → **Disabled**	By pressing <Esc> key, prevent the display of the logo.
Optional board	Install a RAID controller board	**Advanced** → **PCI Configuration** → **PCI Device Controller and Option ROM Settings** → **PCI Slot n Option ROM** → **Enabled**	*n* is PCI slot number of the RAID controller
Memory	Configure the memory after the DIMM is added or exchanged.	**Advanced** → **Memory Configuration** → **Memory Retest** → **Yes**	After rebooting, the **Memory Retest** setting changes to **No** automatically.
Boot	Set to **UEFI** in **Boot mode** depending on the installed OS.	**Boot** → **Boot Mode** → **UEFI** The following OS must be set to UEFI: – Windows Server 2016 – Windows Server 2012 – Windows Server 2012 R2 – VMware ESXi 6 – VMware ESXi 6.5 Later	For details, see *Installation Guide*.
	Set to **Legacy** in **Boot mode** depending on the installed OS.	**Boot** → **Boot Mode** → **Legacy**	For details, see *Installation Guide*.
	Change the boot order of devices	**Boot** → **Boot Option Priorities** → Change the boot priority	
	Use remote power on feature (from RTC alarm)	**Advanced** → **Advanced Chipset Configuration** → **Wake On RTC Alarm** → **Enabled**	
	Control from HW console terminal	**Advanced** → **Serial Port Configuration** → Change respective setting.	
	Set to **Enabled** in **X2APIC** depending on the installed OS.	**Advanced** → **Processor Configuration** → **X2APIC** → **Enabled** The following OS must be set to Enabled: – Windows Server 2016 – Windows Server 2012 – Windows Server 2012 R2 – VMware ESXi 6 – VMware ESXi 6.5 Later	For details, see *Installation Guide*.to select **Enabled** or **Disabled**.
	Set to **Disabled** in **X2APIC** depending on the installed OS.	**Advanced** → **Processor Configuration** → **X2APIC** → **Disabled**	For details, see *Installation Guide*.to select **Enabled** or **Disabled**.

Category	Description	To be changed	Remark
Security	Set a password to restrict operation of SETUP.	**Security** → **Administrator Password** → **Security** → **User password**	After a password is set, the entry of password is displayed when SETUP is launched.
	Set a password to restrict booting.	**Security** → **Password on Boot** → **Enabled**	You can select this parameter after you set a password.
	Use Trusted Boot (TBOOT) with an optional TPM kit.	**Security** → **Trusted Computing** Set to **Enabled** in the following items: - **TPM Support** - **TPM State** - **TXT Support**	If **TXT Support** is **Enabled** and the OS is started, do not disable TPM by a TPM management tool. If disable TPM, **TPM Support** or **TXT Support** cannot be changed. In such a case, Select **Save & Exit** → **Load Setup Defaults**.
UPS Powerlink	When the server is supplied with power from UPS, always turn on the power.	**Server** → **Power Control Configuration** → **AC-LINK** → **Power On**	
	If the server is turned off by using POWER switch, leave it OFF even when UPS supplies power.	**Server** → **Power Control Configuration** → **AC-LINK** → **Last State**	
	Keep the power OFF even when UPS supplies power.	**Server** → **Power Control Configuration** → **AC-LINK** → **Stay off**	

3. EXPRESSSCOPE ENGINE 3

3.1 Overview

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

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

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

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

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

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

Important **This server does not support the Memory Throttling feature.**

3.2 EXPRESSSCOPE ENGINE 3 Network Configuration

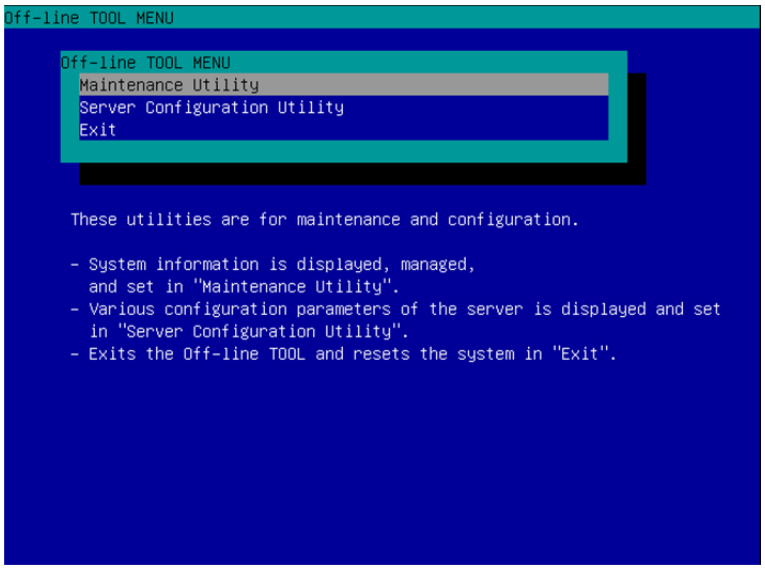
Take the steps below to use EXPRESSSCOPE Engine 3 through the Web browser.

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

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

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

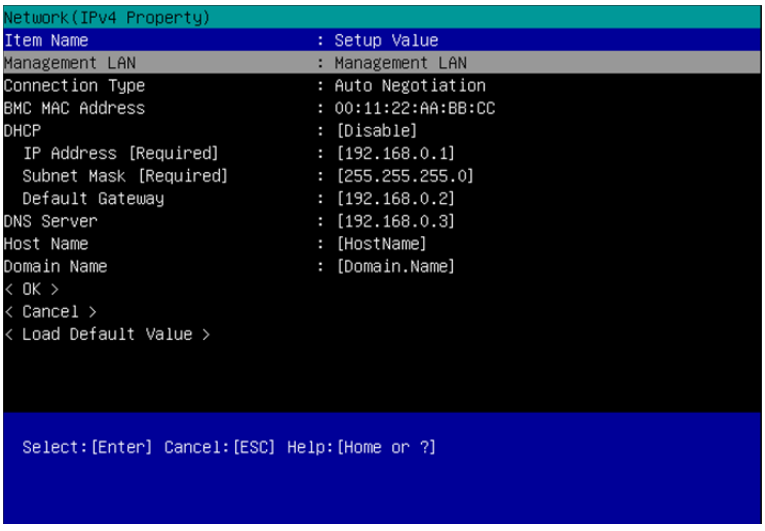
4. On Off-line TOOL MENU, select **Server Configuration Utility** → **EXPRESSSCOPE Engine 3** → **Configuration** → **Network** → **IPv4 Property** or **IPv6 Property**.



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

Tips

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



When **IPv4 Property** is selected

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

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 various bundled software, such as NEC ESMPRO ServerAgentService.
Maintenance	Diagnoses your server system. To use this feature, choose **Tool menu** in Boot Selection Menu.
Instruction manuals	Stores various documents, such as "*User's Guide*", "*Installation Guide*" and "*Maintenance Guide*".

4.2 Usage of EXPRESSBUILDER

If you want to install Windows, start EXPRESSBUILDER by using any of the following.

Internal Flash Memory:

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

Windows Application:

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

EXPRESSBUILDER DVD:

DVD does not come with the product. Purchase the option or download it from the following website

http://www.nec.com/

- Support & Downloads

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

5. Installing Software Components

Continue to install the operating system and other bundled software.

See the instructions below.

- *Installation Guide (Windows)*

6. Turning off the Server

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

1. Shut down the OS.
2. If the server does not automatically power off, press POWER Switch at the front of the server. Confirm that POWER LED is OFF.
3. Turn off peripheral devices.

NEC Express5800 Series
Express5800/T110i

4 Appendix

1. **Specifications**

   Describes specifications of the server.

2. **Interrupt Lines**

   Describes the interrupt lines assigned to this server.

3. **Glossary**

   Describes glossaries of this document.

4. **Revision Record**

   Describes revision history of this document.

1. Specifications

1.1 Express5800/T110i (EXP334)

Product name		Express5800/T110i (EXP334)		
		N8100-2533F/N8100-2707F		
CPU	Type	Intel Celeron processor G3930	Intel Pentium processor G4560	Intel Core-i3 processor 7300
	Clock/cache	2.9 GHz/2 MB	3.5 GHz/3 MB	4 GHz/4 MB
	Standard / (maximum)	Not pre-installed / (1)		
Chipset		Intel C236 Chipset		
Memory	Standard	Not pre-installed		
	Maximum	64 GB (16 GB x 4)		
	Expansion unit	DDR4-2400 SDRAM DIMM (unbuffered) x 1		
	Memory module	ECC DDR4-2400 SD-RAM DIMM		
	Maximum clock	2133MHz	2400MHz	2400MHz
Graphics		Integrated in BMC (more than 32 MB)		
Storage	Hard disk drive (standard)	Not pre-installed		
	Hard disk drive (maximum)	With 3.5-inch Fixed HDD cage (N8154-81F): 48 TB (4 x 12 TB) With 3.5-inch HDD cage (N8154-79F): 48 TB (4 x 12 TB) With 2.5-inch HDD cage (N8154-80F): SATA 16 TB (8 x 2 TB), SAS 19.2 TB (8 x 2.4 TB), SAS SSD 3.2 TB (8 x 400 GB), SATA SSD 12.8 TB (8 x 1.6 TB)		
	RAID	SATA 6 Gb/s : RAID 0/1/10(standard), RAID 5/6/50/60 (optional) SAS 12 Gb/s : RAID 0/1/5/6/10/50/60 (optional)		
	Optical disk drive	Selectable: DVD-ROM drive or DVD SuperMULTI drive		
Expansion bay	Drive bay	Selectable: 3.5-inch Fixed hard disk drive x 4(optional) / 3.5-inch hard disk drive x 4(optional) / 2.5-inch hard disk drive x 8(optional)		
	Backup device	2 slot		
Expansion slot (PCI)		1x PCI Express 3.0 (x16 lane, x16 socket) 1x PCI Express 3.0 (x4 lane, x8 socket) 1x PCI Express 3.0 (x2 lane, x8 socket) 1x PCI Express 3.0 (x1 lane, x8 socket)		
External interface	USB3.0	Front: 2 port; rear: 4 ports; internal: 1 port		
	Serial	1 port (D-sub 9-pin)*1		
	Network	2x 1000Base-T/100Base-TX/10Base-T (RJ-45) 1x 1000Base-T/100Base-TX/10Base-T (RJ-45):Management LAN exclusive use.		
	Display	MINI D-sub 15-pin (1 port)		
Dimensions (width x depth x height)		175.0 mm x 469.3 mm x 367.0 mm (not including stabilizer and protrusions) 49.0 mm x 487.0 mm x 367.0 mm (including stabilizer and protrusions)		
Weight (maximum)		11.0 kg (18.5 kg)		
Power supply		1 x 400 W 80 PLUS Gold (bipolar grounded outlet) (hot-plug not available) (N8100-2533F) 1 x 500 W 80 PLUS Gold (bipolar grounded outlet) (hot-plug not available) (N8100-2707F) 100/200 VAC ± 10%, 50/60 Hz ± 3 Hz		
Power rating		455 W		
Environmental requirements	Operating	Temperature: 5 to 40°C (when the high-temperature environment is set: 5 to 48℃(it's subject to composition restrictions.)); Humidity: 10 to 85% (and no condensation) *2		
	Non-operating	Temperature: −10 to 55°C; Humidity: 10 to 85% (and no condensation) *2		
Bundled OS		None		
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 Microsoft Windows Server 2012 R2 Foundation Microsoft Windows Server 2016 Standard Microsoft Windows Server 2016 Datacenter Microsoft Windows Server 2016 Essentials		
Accessories		Getting Started, Screws for device, Power cord, SDR Update tool		

*1 Can be optionally expanded to two ports.
*2 When internal LTO is installed (no condensation of moisture)

Product name		Express5800/T110i (EXP334)			
		N8100-2533F/N8100-2707F			
CPU	Type	Intel Xeon processor E3-1220 v6	Intel Xeon processor E3-1225 v6	Intel Xeon processor E3-1230 v6	Intel Xeon processor E3-1270 v6
	Clock/cache	3 GHz/8 MB	3.3 GHz/8 MB	3.5 GHz/8 MB	3.8 GHz/8 MB
	Standard / (maximum)	Not pre-installed / (1)			
Chipset		Intel C236 Chipset			
Memory	Standard	Not pre-installed			
	Maximum	64 GB (16 GB x 4)			
	Expansion unit	DDR4-2400 SDRAM DIMM (unbuffered) x 1			
	Memory module	ECC DDR4-2400 SD-RAM DIMM			
	Maximum clock	2400MHz			
Graphics		Integrated in BMC (more than 32 MB)			
Storage	Hard disk drive (standard)	Not pre-installed			
	Hard disk drive (maximum)	With 3.5-inch Fixed HDD cage (N8154-81F): 48 TB (4 x 12 TB) With 3.5-inch HDD cage (N8154-79F): 48 TB (4 x 12 TB) With 2.5-inch HDD cage (N8154-80F): SATA 16 TB (8 x 2 TB), SAS 19.2 TB (8 x 2.4 TB), SAS SSD 3.2 TB (8 x 400 GB), SATA SSD 12.8 TB (8 x 1.6 TB)			
	RAID	SATA 6 Gb/s : RAID 0/1/10(standard), RAID 5/6/50/60 (optional) SAS 12 Gb/s : RAID 0/1/5/6/10/50/60 (optional)			
	Optical disk drive	Selectable: DVD-ROM drive or DVD SuperMULTI drive			
Expansion bay	Drive bay	Selectable: 3.5-inch Fixed hard disk drive x 4(optional) / 3.5-inch hard disk drive x 4(optional) / 2.5-inch hard disk drive x 8(optional)			
	Backup device	2 slot			
Expansion slot (PCI)		1x PCI Express 3.0 (x16 lane, x16 socket) 1x PCI Express 3.0 (x4 lane, x8 socket) 1x PCI Express 3.0 (x2 lane, x8 socket) 1x PCI Express 3.0 (x1 lane, x8 socket)			
External interface	USB3.0	Front: 2 port; rear: 4 ports; internal: 1 port			
	Serial	1 port (D-sub 9-pin)*1			
	Network	2x 1000Base-T/100Base-TX/10Base-T (RJ-45) 1x 1000Base-T/100Base-TX/10Base-T (RJ-45):Management LAN exclusive use.			
	Display	MINI D-sub 15-pin (1 port)			
Dimensions (width x depth x height)		175.0 mm x 469.3 mm x 367.0 mm (not including stabilizer and protrusions) 49.0 mm x 487.0 mm x 367.0 mm (including stabilizer and protrusions)			
Weight (maximum)		11.0 kg (18.5 kg)			
Power supply		1 x 400 W 80 PLUS Gold (bipolar grounded outlet) (hot-plug not available) (N8100-2533F) 1 x 500 W 80 PLUS Gold (bipolar grounded outlet) (hot-plug not available) (N8100-2707F) 100/200 VAC ± 10%, 50/60 Hz ± 3 Hz			
Power rating		455 W			
Environmental requirements	Operating	Temperature: 5 to 40°C (when the high-temperature environment is set: 5 to 48℃(it's subject to composition restrictions.)); Humidity: 10 to 85% (and no condensation) *2			
	Non-operating	Temperature: −10 to 55°C; Humidity: 10 to 85% (and no condensation) *2			
Bundled OS		None			
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 Microsoft Windows Server 2012 R2 Foundation Microsoft Windows Server 2016 Standard Microsoft Windows Server 2016 Datacenter Microsoft Windows Server 2016 Essentials			
Accessories		Getting Started, Screws for device, Power cord, SDR Update tool			

*1 Can be optionally expanded to two ports.
*2 When internal LTO is installed (no condensation of moisture)

1.2 Express5800/T110i (EXP334A)

Product name		Express5800/T110i (EXP334A)		
		N8100-2534F		
CPU	Type	Intel Celeron processor G3930	Intel Pentium processor G4560	Intel Core-i3 processor 7300
	Clock/cache	2.9 GHz/2 MB	3.5 GHz/3 MB	4 GHz/4 MB
	Standard / (maximum)	Not pre-installed / (1)		
Chipset		Intel C236 Chipset		
Memory	Standard	Not pre-installed		
	Maximum	64 GB (16 GB x 4)		
	Expansion unit	DDR4-2400 SDRAM DIMM (unbuffered) x 1		
	Memory module	ECC DDR4-2400 SD-RAM DIMM		
	Maximum clock	2133MHz	2400MHz	2400MHz
Graphics		Integrated in BMC (more than 32 MB)		
Storage	Hard disk drive (standard)	Not pre-installed		
	Hard disk drive (maximum)	With 3.5-inch Fixed HDD cage (N8154-81F): 48 TB (4 x 12 TB) With 3.5-inch HDD cage (N8154-79F): 48 TB (4 x 12 TB) With 2.5-inch HDD cage (N8154-80F): SATA 16 TB (8 x 2 TB), SAS 19.2 TB (8 x 1.8 TB), SAS SSD 3.2 TB (8 x 400 GB), SATA SSD 12.8 TB (8 x 1.6 TB)		
	RAID	SATA 6 Gb/s : RAID 0/1/10(standard), RAID 5/6/50/60 (optional) SAS 12 Gb/s : RAID 0/1/5/6/10/50/60 (optional)		
	Optical disk drive	Selectable: DVD-ROM drive or DVD SuperMULTI drive		
Expansion bay	Drive bay	Selectable: 3.5-inch Fixed hard disk drive x 4(optional) / 3.5-inch hard disk drive x 4(optional) / 2.5-inch hard disk drive x 8(optional)		
	Backup device	2 slot		
Expansion slot (PCI)		1x PCI Express 3.0 (x16 lane, x16 socket) 1x PCI Express 2.0 (x4 lane, x8 socket) 1x PCI Express 2.0 (x2 lane, x8 socket) 1x PCI Express 2.0 (x1 lane, x8 socket)		
External interface	USB3.0	Front: 2 port; rear: 4 ports; internal: 1 port		
	Serial	1 port (D-sub 9-pin)*1		
	Network	2x 1000Base-T/100Base-TX/10Base-T (RJ-45) 1x 1000Base-T/100Base-TX/10Base-T (RJ-45):Management LAN exclusive use.		
	Display	MINI D-sub 15-pin (1 port)		
Dimensions (width x depth x height)		175.0 mm x 469.3 mm x 367.0 mm (not including stabilizer and protrusions) 249.0 mm x 498.4 mm x 367.0 mm (including stabilizer and protrusions)		
Weight (maximum)		11.0 kg (18.5 kg)		
Power supply		2 x 460W 80 PLUS Platinum compliant (bipolar grounded outlet) (hot-plug available) 100/200 VAC ± 10%, 50/60 Hz ± 3 Hz		
Power rating		532 W		
Environmental requirements	Operating	Temperature: 5 to 40°C (the high-temperature environment is set: 5 to 48°C(it's subject to composition restrictions.)); Humidity: 10 to 85% (and no condensation) *2		
	Non-operating	Temperature: −10 to 55°C; Humidity: 10 to 85% (and no condensation) *2		
Bundled OS		None		
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 Microsoft Windows Server 2012 R2 Foundation Microsoft Windows Server 2016 Standard Microsoft Windows Server 2016 Datacenter Microsoft Windows Server 2016 Essentials		
Accessories		Getting Started, Screws for device, Power cord, SDR Update tool		

*1 Can be optionally expanded to two ports.
*2 When internal LTO is installed (no condensation of moisture)

Product name		Express5800/T110i (EXP334A)			
		N8100-2534F			
CPU	Type	Intel Xeon processor E3-1220 v6	Intel Xeon processor E3-1220 v6	Intel Xeon processor E3-1230 v6	Intel Xeon processor E3-1270 v6
	Clock/cache	3 GHz/8 MB	3.3 GHz/8 MB	3.5 GHz/8 MB	3.8 GHz/8 MB
	Standard / (maximum)	Not pre-installed / (1)			
Chipset		Intel C236 Chipset			
Memory	Standard	Not pre-installed			
	Maximum	64 GB (16 GB x 4)			
	Expansion unit	DDR4-2400 SDRAM DIMM (unbuffered) x 1			
	Memory module	ECC DDR4-2400 SD-RAM DIMM			
	Maximum clock	2400MHz			
Graphics		Integrated in BMC (more than 32 MB)			
Storage	Hard disk drive (standard)	Not pre-installed			
	Hard disk drive (maximum)	With 3.5-inch Fixed HDD cage (N8154-81F): 48 TB (4 x 12 TB) With 3.5-inch HDD cage (N8154-79F): 48 TB (4 x 12 TB) With 2.5-inch HDD cage (N8154-80F): SATA 16 TB (8 x 2 TB), SAS 19.2 TB (8 x 2.4 TB), SAS SSD 3.2 TB (8 x 400 GB), SATA SSD 12.8 TB (8 x 1.6 TB)			
	RAID	SATA 6 Gb/s : RAID 0/1/10(standard), RAID 5/6/50/60 (optional) SAS 12 Gb/s : RAID 0/1/5/6/10/50/60 (optional)			
	Optical disk drive	Selectable: DVD-ROM drive or DVD SuperMULTI drive			
Expansion bay	Drive bay	Selectable: 3.5-inch Fixed hard disk drive x 4(optional) / 3.5-inch hard disk drive x 4(optional) / 2.5-inch hard disk drive x 8(optional)			
	Backup device	2 slot			
Expansion slot (PCI)		1x PCI Express 3.0 (x16 lane, x16 socket) 1x PCI Express 2.0 (x4 lane, x8 socket) 1x PCI Express 2.0 (x2 lane, x8 socket) 1x PCI Express 2.0 (x1 lane, x8 socket)			
External interface	USB3.0	Front: 2 port; rear: 4 ports; internal: 1 port			
	Serial	1 port (D-sub 9-pin)*1			
	Network	2x 1000Base-T/100Base-TX/10Base-T (RJ-45) 1x 1000Base-T/100Base-TX/10Base-T (RJ-45):Management LAN exclusive use.			
	Display	MINI D-sub 15-pin (1 port)			
Dimensions (width x depth x height)		175.0 mm x 469.3 mm x 367.0 mm (not including stabilizer and protrusions) 249.0 mm x 498.4 mm x 367.0 mm (including stabilizer and protrusions)			
Weight (maximum)		11.0 kg (18.5 kg)			
Power supply		2 x 460W 80 PLUS Platinum compliant (bipolar grounded outlet) (hot-plug available) 100/200 VAC ± 10%, 50/60 Hz ± 3 Hz			
Power rating		532 W			
Environmental requirements	Operating	Temperature: 5 to 40°C (the high-temperature environment is set: 5 to 48℃(it's subject to composition restrictions.)); Humidity: 10 to 85% (and no condensation) *2			
	Non-operating	Temperature: −10 to 55°C; Humidity: 10 to 85% (and no condensation) *2			
Bundled OS		None			
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 Microsoft Windows Server 2012 R2 Foundation Microsoft Windows Server 2016 Standard Microsoft Windows Server 2016 Datacenter Microsoft Windows Server 2016 Essentials			
Accessories		Getting Started, Screws for device, Power cord, SDR Update tool			

*1 Can be optionally expanded to two ports.
*2 When internal LTO is installed (no condensation of moisture)

2. Interrupt Lines

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

- **Interrupt lines**
  As factory settings, interrupt lines are assigned as follows.

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

3. Glossary

Term	Description
BIOS Setup Utility (SETUP)	Software for setting BIOS. You can run this software by pressing <F2> key during POST.
BMC	Baseboard Management Controller (BMC) is a built-in controller that supports the IPMI version 2.0 protocol. BMC can manage the server hardware.
BMC RESET Switch	A switch for resetting the BMC of the server. This resets the BMC without clearing the BMC settings. Use the switch if the problem on the BMC occurs.
DUMP Switch	A switch that is used for collecting the memory dump if an error occurs. You can specify the destination of the dump by using the Windows function.
EXPRESSBUILDER	Standard software for setting up the server easily. This also includes several useful applications and instruction manuals.
EXPRESSSCOPE ENGINE 3	A name of BMC for NEC Express5800 series.
EXPRESSSCOPE Profile Key	A removable flash memory that stored the settings of BIOS and BMC. If the motherboard of the server is replaced, you can use former settings when moving this flash memory from the former motherboard.
Express Report Service	Software that can report the server failure to the contact center by E-mail or modem. This software is installed with NEC ESMPRO ServerAgentService to the server.
Express Report Service (HTTPS)	Software that can report the server failure to the contact center by HTTPS. This software is installed with NEC ESMPRO ServerAgentService to the server.
Express Report Service (MG)	Software that can report the server failure to the contact center by E-mail, modem or HTTPS without NEC ESMPRO ServerAgentService. This software is installed with NEC ESMPRO Manager to "PC for Management".
ExpressUpdate	A feature for updating BIOS, firmware, driver, or software of the server. This feature is available when NEC ESMPRO Manager cooperates with EXPRESSSCOPE ENGINE 3 and ExpressUpdate Agent.
ExpressUpdate Agent	Software for performing ExpressUpdate. This is installed to the server.
Flash FDD	An optional USB device that can use as a floppy disk drive.
Internal Flash Memory	A built-in flash memory that stored EXPRESSBUILDER as standard. You can start EXPRESSBUILDER from it without DVD when pressing <F3> key during POST.
NEC ESMPRO	Standard software for the server management. This consists of several applications for managing or monitoring.
NEC ESMPRO Agent Extension	Software for performing the scheduled operations. This works with NEC ESMPRO Manager.
NEC ESMPRO Manager	Software for managing multiple servers on network.
NEC ESMPRO ServerAgentService	Software for monitoring the server. This works with NEC ESMPRO Manager. You can choose Service Mode or Non-Service Mode when installing this software. Service Mode resides as the OS service and Non-Service Mode does not use the OS service to reduce memory, CPU power, and other OS resources.
OEM driver	A Windows driver for the mass storage device.
OS standard installer	An installer that stored in Windows installation disc. Use this installer if you want to install the OS manually.
Offline tools	Software that can read or change SEL, SDR, FRU, and other IPMI data. You can start Offline tools when pressing <F4> key during POST.
PC for Management	A computer for managing the server on network. A general Windows/Linux computer can be used as "PC for Management".
Product Info Collection Utility	Software for collecting several hardware/software statuses or event logs. You can easily collect the data for the server maintenance by using this software.

Term	Description
RAID Configuration Utility	Software for configuring RAID arrays. You can run this software during POST.
Server Configuration Utility	Software for setting BIOS or BMC. You can use as Windows application or run this software when pressing <F4> key during POST. This software is the same as BMC Configuration of former models.
Starter Pack	Software package for the server. This software includes the customized drivers for Windows. This must be installed before using Windows on the server.
TPM Kit	An optional product of Trusted Platform Module for the server.
Universal RAID Utility	Software for setting RAID arrays on Windows/Linux. This software is operated on "PC for Management" with NEC ESMPRO Manager.
Windows OS parameter file	A file that saved settings for installing Windows. You can install with the settings in this file when setting Windows with EXPRESSBUILDER.

4. Revision Record

Revision (Document Number)	Date Issued	Description
10.116.02-101.01	April 2017	Newly created
10.116.02-101.02	May 2018	Support new RAID controller and 500W Fixed power supply.
	Aug 2018	Clerical corrections

NEC Express Server

Express5800/T110i
User's Guide

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