N8800-149F, EXP320L

NEC Express5800/R320a-E4

N8800-150F, EXP320M

NEC Express5800/R320a-M4

User's Guide

PROPRIETARY NOTICE AND LIABILITY DISCLAIMER

Keep this User's Guide handy for quick reference when necessary.

SAFETY INDICATIONS

To use NEC Express5800 series safely, follow the instructions in this User's Guide.

This guide explains components that pose a danger, types of dangers, and actions taken to prevent them; such components are labeled warning.

This guide and warning labels use "WARNING" and "CAUTION" to indicate a danger depending on the degree. These terms are defined as follows:

⚠ **WARNING**	Indicates a danger that could lead to a death or serious injury.
⚠ **CAUTION**	Indicates a danger that could lead to a burn, other injuries or damage to physical assets.

This guide uses the following three types of symbols to give indications and precautions against a danger. They are defined as follows:

⚠	Indicates that there is a risk of danger. Each image symbolizes a particular type of danger. (Attention)
🚫	Indicates what you must not do. Each image symbolizes a particular type of prohibition. (Prohibited actions)
⬤	Indicates what you must do. Each image symbolizes a particular type of action necessary to avoid a danger. (Mandatory actions)

(Example)

Symbol to draw attention

Term indicating a degree of danger

⚠ **CAUTION**
High temperature. Immediately after the power-off, system components such as hard disk are very hot. Wait the server to cool down completely before adding/removing some component.

Symbol indicating a prohibited action (may not always be indicated)

Description of a danger

SYMBOLS USED IN THIS USER'S GUIDE AND WARNING LABELS

Attention

	Indicates a risk of an electric shock.
	Indicates a risk of a personal injury due to heat.
	Indicates a risk of catching your fingers.
	Indicates a risk of a fire or smoke.
	Indicates a general precaution or warning that is not defined herein.
	Indicates a risk of losing eyesight due to laser beam.
	Indicates a risk of an explosion.
	Indicates a risk of a personal injury.

Prohibited actions

	Indicates a general prohibition that is not defined herein.
	Do no touch the indicated area. There is a risk of an electric shock or fire.
	Do not touch with wet hands. There is a risk of an electric shock.
	Keep from flame. There is a risk of a fire.
	Avoid using water or liquid nearby. If it spills on the equipment, there is a risk of an electric shock or fire.
	Do not disassemble, repair, or modify the equipment. There is a risk of an electric shock or fire.

Mandatory actions

	Unplug the server. There is a risk of an electric shock or fire.
	Indicates a general action to take that is not defined herein. Make sure to follow the instructions.
	Be sure to provide earthing. Otherwise, an electric shock or fire may be caused.

For detailed notes to relate safely, refer to "Precautions for Use" on chapter 1.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

BSMI Statement

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

CCC Statement

声　明

此为 A 级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

KCC Statement

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CE Mark Statement

Australia EMI:
NOTE: This is a Class A product. In domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

Canada EMI:
This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

**CLASS 1
LASER PRODUCT**

This system is classified as a CLASS 1 LASER PRODUCT. This label id located on the internal DVD-ROM installed in your system.

NOTE: This product provides resistance against hardware faults with its redundant hardware modules. However, this does not mean complete fault-tolerance is assured. For example, there is a risk of system down when:
- A fatal fault occurs in software.
- Both modules within a redundant hardware pair break down.
- A fatal fault occurs in a non-redundant component, such as the clock generator circuitry or the interconnect backplane.
- The entire system is cut off from AC power.

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Windows Server 2008 is the abbreviation for Microsoft Windows Server 2008 Standard operating system and Microsoft Windows Server 2008 Enterprise operating system.

Microsoft Windows Server 2003 R2 Standard x64 Edition operating system and Microsoft Windows Server 2003 R2 Enterprise x64 Edition operating system or Microsoft Windows Server 2003 Enterprise x64 Edition operating system are called Windows Server 2003 x64 Edition for short. Microsoft Windows Server 2003 R2 32-bit Standard Edition operating system, Microsoft Windows Server 2003 R2 32-bit Enterprise Edition operating system, Microsoft Windows Server 2003 Standard Edition operating system and Microsoft Windows Server 2003 Enterprise Edition operating system are called Windows Server 2003 for short. Microsoft Windows 2000 Server operating system, Microsoft Windows 2000 Advanced Server operating system and Microsoft Windows 2000 Professional operating system are called Windows 2000 for short. Microsoft Windows Vista Business operating system is called Windows Vista for short. Microsoft Windows XP Professional x64 Edition operating system is called Windows XP x64 Edition for short. Microsoft Windows XP Home Edition

operating system and Microsoft Windows XP Professional operating system are called Windows XP for short. Microsoft Windows NT Server network operating system version 3.51/4.0 and Microsoft Windows NT Workstation operating system version 3.51/4.0 are called Windows NT for short. Microsoft Windows Millennium Edition Operating System is called Windows Me for short. Microsoft Windows 98 operating system is called Windows 98 for short. Microsoft Windows 95 operating system is called Windows 95 for short. Names used with sample applications are all fictitious. They are unrelated to any existing product names, names of organizations, or individual names.

The patent numbers for the DVC technology of Avocent US.

US Patent Number: 5,732,212/5,937,176/6,633,905/6,681,250/6,701,380 (others patents pending)
Taiwanese Patent Number: 173784
European Patent Number: 0 740 811

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PREFACE

Welcome to the NEC Express5800/ft series.

NEC Express5800/ft series is a "fault-tolerant (ft)" server focusing on "high reliability" in terms of fault-tolerance, in addition to "high performance," "scalability," and "general versatility" provided by NEC Express5800 series. In the event of trouble, its dual configuration will allow the system to instantaneously isolate the failed parts to assure non-stop running; operation will be moved smoothly from one module to the other, minimizing damage to it. You can use this NEC Express5800/ft series in a mission-critical system where high availability is required. By the use of VMware, it also provides outstanding openness for general-purpose applications, etc.

To make the best use of these features, read this User's Guide thoroughly to understand how to operate NEC Express5800/ft series.

ABOUT THIS USER'S GUIDE

This User's Guide helps a user to properly setup and use the product.

Consult this guide to ensure safety as well as to cope with trouble during a system setup and daily operation.

Keep this manual handy.

This User's Guide is intended for users who have a good knowledge on the basic use of VMware ESX and general I/O devices such as a keyboard and mouse.

How to Use This User's Guide

This guide consists of eight chapters and appendices. To help you find a solution quickly, the guide contains the following information:

For descriptions on setting up this product, see the separate volume "User's Guide (Setup)."
Read "Precautions for Use" first.
Before going on to main chapters, be sure to read "Precautions for Use." These precautions are very important for using the product safely.

Chapter 1   Precautions for Use
This chapter describes precautions necessary to use the product safely and properly. Be sure to read this chapter before using the product. It also provides information on user support. It will be helpful when you need maintenance service, support, etc.

Chapter 2   General Description
This chapter describes what you should know about the product: its component names, functions, operating procedures as well as handling of devices and other parts.

Chapter 3   ESX Operation and Configuration
This chapter describes setup and operation specific to the product when it is on ESX.

Chapter 4   System Configuration
This chapter describes how to make settings of built-in basic input/output system. It also describes factory-shipped parameters.

Chapter 5   Installing and Using Utilities
This chapter describes features and operating procedures of a standard utility "NEC EXPRESSBUILDER." It also describes procedures to install and operate various software programs contained in its DVD.

Chapter 6   Maintenance
This chapter describes maintenance procedures and use of maintenance tools. If you need to move the product for maintenance purposes, follow the steps provided in this chapter.

Chapter 7   Troubleshooting
If the product does not work properly, see this chapter before deciding that it is a breakdown.

Chapter 8   System Upgrade
This chapter describes procedures to add options and precautions. See also this chapter when you replace failed components.

Appendix A   Specifications
This appendix lists specifications of the product.

Additional symbols

The following symbols are used throughout this User's Guide in addition to the caution symbols describe at the beginning.

IMPORTANT:	Important points or instructions to keep in mind when using the server or software
CHECK:	Something you need to make sure when using the server of software
TIPS:	Helpful information, something useful to know

About our Web Service

Information on NEC Express5800/ft series including modification modules is also available on our web site, NEC Global Site:

http://www.nec.com/

ACCESSORIES

This product is shipped with various accessories. See the packing list to make sure everything is included and check the individual items. If some component is missing or damaged, contact your sales agent.

■ Keep the accessories in a safe place. You will need them when you perform setup, addition of options, or replacement of failed components.

■ To check NEC EXPRESSBUILDER components, see the attached list.

■ Be sure to fill out and mail the software registration card that is attached to your operating system.

■ Make backup copies of included floppy disks, if any. Keep the original disks as the master disks; use these copies in operation.

■ Improper use of an included floppy disk or DVD may alter your system environment. If you find something unclear, stop using them and contact your sales agent.

CONTENTS

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Chapter 1

Precautions for Use

This chapter includes information necessary for proper and safe operation of the server.

WARNING LABELS

Warning label is placed in the certain part of the system so that the user stays alert to possible risks. Do not remove or damage the label.If this label is missing, about to peel off, or illegible, contact your sales agent.

The figures below show the location of this label on the server.

Front of Device
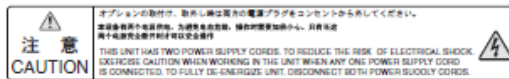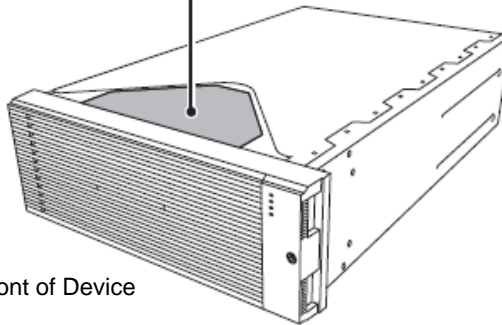
Back of Device
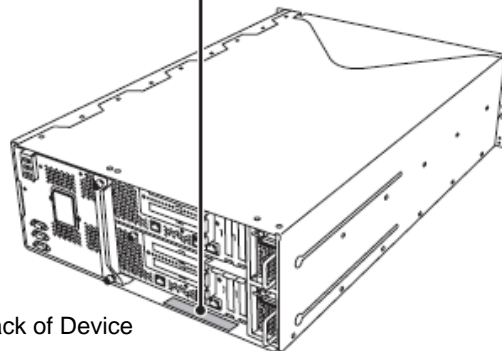
PRECAUTIONS FOR SAFETY

This section provides precautions for using the server safely. Read this section carefully to ensure proper and safe use of the server. For symbol meanings, see "SAFETY INDICATIONS" described in the previous section.

General

⚠ WARNING	
🚫	Do not use the equipment in an operation where human lives are involved or high reliability is required. This equipment is not intended for use and control in facilities/systems where human lives are involved or high reliability is required, including medical devices, nuclear facilities, aerospace equipments, transportation facilities or traffic control facilities. NEC assumes no liability for any accidents or damage to physical assets resulting from the use of this equipment in such systems or facilities.
🔥🔌🚫	Do not continue to use the equipment if you detect smoke, odor, or noise. If the equipment emits smoke, odor, or noise, immediately flip off the POWER switch, unplug the cord, and contact your sales agent. There is a risk of a fire if you continue to use the equipment.
⚡🚫	Do not insert a wire or metal object. Do not insert a wire or metal objects into a vent or disk drive slot. There is a risk of an electric shock.

⚠ CAUTION	
🔥⚡🚫	Prevent water or foreign objects from getting into the equipment. Do not let water or foreign objects (e.g., pins or paper clips) enter the equipment. There is a risk of a fire, electric shock, and breakdown. When such things accidentally enter the equipment, immediately turn off the power and unplug the cord. Contact your sales agent without trying to disassemble it yourself.

Use of Power Supply and Power Cord

⚠ WARNING

Do not handle a power plug with a wet hand.

Do not plug/unplug a power cord with a wet hand.
There is a risk of an electric shock.

Do not connect the ground wire to a gas pipe.

Never connect the ground wire to a gas pipe.
There is a risk of a gas explosion.

⚠ CAUTION

Do not plug the attached cord in a nonconforming outlet.

Use a wall outlet with specified voltage and power type.
There is a risk of a fire or electricity leakage if you use a nonconforming outlet.
Avoid installing the equipment where you may need an extension cord. If the cord that does not meet the power specifications, there is a risk of overheating that could lead to a fire.

Do not plug multiple cords in a single outlet.

If the rated current exceeds the rating, there is a risk of overheating that could lead to a fire.
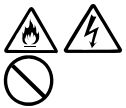
Do not plug the cord insecurely.

Insert the plug firmly into an outlet. There is a risk of heat or fire due to poor contact when you insert the plug insecurely. If dust settles on the slots and it absorbs moisture, there is also a risk of heat or fire.
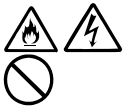
Do not use nonconforming power cords.

Do not use any AC cord other than the enclosed one. There is a risk of fire when the current exceeds the rating on the cord.
You also have to observe the following prohibitions about handling and connecting interface cables.
- Do not pull on the cord.
- Do not pinch the cord.
- Do not bend the cord.
- Keep chemicals away from the cord.
- Do not twist the cord.
- Do not place any object on the cord.
- Do not use cords as bundled.
- Do not alter, modify, or repair the cord.
- Do not staple the cord.
- Do not use any damaged cord. (Replace it with a new one of the same specifications. For replacement procedures, contact your sales agent.)

⚠ **CAUTION**

Do not use any power outlet other than one for 3-prong.

This equipment has a 3-prong plug attached. You can only plug-in to a 3-prong outlet. If you plug in to any outlets other than the 3-prong one, you may get electric shock.
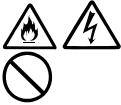
Do not use the enlcosed power cord for other devices or purposes.

The attached power cord is specifically designed for use in connecting to this equipment and its safety is confirmed. Do not use the power cord to other devices Doing so may result in fire or electric shock.

Installation, Relocation, Storage and Connection

	CAUTION
⚠🚫	**Do not install or store the equipment in an unsuitable place.** Install or store the equipment in such a place as specified in this User's Guide. There is a risk of a fire if you place the server in a place such as follows. ■ a dusty place ■ a humid place located near a boiler, etc ■ a place exposed to direct sunlight ■ an unstable place
⚠🚫	**Do not use or store this product under corrosive gas environment.** Avoid the usage or storage of this product in an environment which may be exposed to corrosive gases, such as those including but not limited to: sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia and/or ozone. Avoid installing this product in a dusty environment or one that may be exposed to corrosive materials such as sodium chloride and/or sulfur. Avoid installing this product in an environment which may have excessive metal flakes or conductive particles in the air. Such environments may cause corrosion or short circuits of the printed board within this product, resulting in not only damage to this product, but may even lead to be a fire hazard. If there are any concerns regarding the environment at the planned site of installation or storage, please contact your sales agent.
⚠🚫	**Do not use any non-designated interface cable.** Use only interface cables designated by NEC; identify which component or connector to attach beforehand. If you use an inappropriate cable or make a wrong connection, there is a risk of short-circuit that could lead to a fire. You also have to observe the following prohibitions about handling and connecting interface cables: ■ Do not use any damaged cable connector. ■ Do not step on the cable. ■ Do not place any object on the cable. ■ Do not use the equipment with loose cable connections. ■ Do not use any damaged cable.
🚫	**Do not disable the lock mechanism.** Do not use this product with the lock mechanism being removed or disabled. Doing so may cause personal injury if this product drops.

Cleaning and Handling of Internal Devices

	⚠ **WARNING**
	Do not disassemble, repair, or alter the server. Unless described herein, never attempt to disassemble, repair, or alter the equipment. There is a risk of an electric shock or fire as well as malfunction.
	Do not look into the optical disk drive. The optical disk drive uses a laser beam. Do not look or insert a mirror inside while the system is on. A laser beam is invisible; if your eyes are exposed to the laser beam, there is a risk of losing eyesight.
	Do not detach a lithium battery yourself. This equipment has a lithium battery. Do not detach it yourself. If the battery is exposed to fire or water, it could explode. When the equipment does not work correctly because of lithium battery life, contact your sales agent. Do not disassemble replace or recharge the battery yourself.
	Caution for electric shock You can replace internal, optional devices while the equipment is powered-on. However, carefully follow the instructions on this guide when you do so. If you touch the internal devices other than the ones described in this guide, there is a risk of electrical shock. Make sure to power off the equipment and disconnect the power plug from a power outlet before cleaning or installing/removing internal optional devices. Touching any internal device of the equipment with its power cord connected to a power source may cause an electric shock even if the server is off-powered. Disconnect the power plug from the outlet occasionally and clean the plug with a dry cloth. Heat will be generated if condensation is formed on a dusty plug, which may cause a fire.

⚠ **CAUTION**

High temperature

Immediately after powering off the system, system components such as hard disk drive may be very hot. Wait for the server to cool down completely before adding/removing components.

Make sure to complete installation.

Firmly install all power cords, interface cables and/or boards. An incompletely installed component may cause a contact failure, resulting in fire and/or smoke.

Protect the unused connectors with the protective cap.

The unused power cord connectors are covered with the protective cap to prevent short circuits and electrical hazards. Attach the protective cap to the unused connector. Failure to follow this warning may cause a fire or an electric shock.

During Operation

⚠ CAUTION
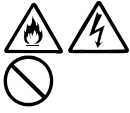
	Keep animals away. Animal's waste or hair may get inside the equipment to cause a fire or electric shock.
	Do not place any object on top of the server. The object may fall off to cause injuries, damage to hardware and/or a fire.
	Do not leave the optical disk drive's tray ejected. Dust may get in the equipment to cause malfunction. The ejected tray may also become a cause of injuries.
	Do not touch the equipment when it thunders. Unplug the equipment when it threatens to thunder. If it starts to thunder before you unplug the equipment, do not touch the equipment and cables. There is a risk of a fire or electric shock.

Rack-mount Model

⚠ **WARNING**
⊘   Do not install the equipment on a nonconforming rack. Install the equipment on a 19-inch rack conforming to the EIA standard. Do not use the equipment without a rack or install it on a nonconforming rack. The equipment may not function properly, and there is a risk of damage to physical assets or injuries. For suitable racks, contact your sales agent.
⊘   Do not use in the spot other than the designated one. Install this equipment in the spot where it satisfies the conditions of installation. Installing this equipment in an undesirable spot causes negative effects on the equipment itself and other systems. There is also a risk of a fire as well as an injury caused by the rack that falls. Refer to the description that is attached the rack, or contact your maintenance service agent for the detailed accounts of the installation spot or a seismic construction.

⚠ CAUTION

Be careful not to hurt your fingers.

Exercise great care not to hurt your fingers on the rail when you mount/dismount the server into/from the rack.

Do not attempt to install the server yourself.

Transport and install the rack with three and more people. Doing so with two people and less could cause the falling of the rack and damaging the surroundings. Make sure to support a rack, transport and install it particularly when it is a high one (such as 44U rack) that is not anchored with stabilizers.

Do not install the equipment in such a manner that its weight is imposed on a single place.

To distribute the weight, attach stabilizers or install two or more racks. It may fall down to cause injuries.

Do not assemble parts alone. Check the hinges and gudgeons.

Mount doors and trays to a rack with two and more people. Make sure that the hinges and gudgeons on the top and the bottom of the door when you install it. Neglecting this check could lead to dropping some parts and cause a breakage of them or could result in injuries.

Do not pull an equipment out of the rack if it is unstable.

Before pulling out a equipment, make sure that the rack is fixed (by stabilizers or quake-resistant engineering). It may fall down to cause injuries.

Do not leave two or more equipments pulled out from the rack.

If you pull out two or more equipments, it may fall down to cause injuries. You can only pull out one equipment at a time.

Do not install excessive wiring.

To prevent burns, fires, and damage to the equipment, make sure that the rated load of the power branch circuit is not exceeded. For more information on installation and wiring of power-related facilities, contact your electrician or local power company.

Do not pull out a equipment from the rack during operation.

Do not pull out a equipment while it works. There is a risk of malfunction and injuries.

For Proper Operation

Observe the following instructions for successful operation of the server. Failure to observe them could lead to malfunction or breakdown.

- Do not use a cellular phone or pager around the equipment. Turn off your cellular phone or pager when you use the equipment. Their radio waves may cause the equipment to malfunction.

- Perform installation in a place where the system can operate correctly. For details, see the separate volume "User's Guide (Setup)."

- Before turning off the power or ejecting a disk, make sure that the access LED is off.

- When you have just turned off the power, wait at least 30 seconds before turning it on again.

- Once you have turned on the server, do not turn it off until the "NEC" logo appears on the screen.

- After plugging in the power cord, do not turn on the power of the equipment for 30 seconds.

- For safe operation, it is recommended to reboot the OS after duplication is completed.

- Before you move the equipment, turn off the power and unplug the cord.

- This server shall not assure reproduction of copy-protect CDs using reproduction equipment if such disks do not comply with CD standards.

- Clean the equipment regularly. (For procedures, see Chapter 6.) Regular cleaning is effective in preventing various types of trouble.

- Lightning may cause voltage sag. As a preventive measure, it is recommended to use UPS (uninterruptible power supply).

  This equipment does not support the connection through an UPS serial port (RS-232C) or the control using PowerChute *Plus*.

- Check and adjust the system clock before operation in the following conditions:

  - After transporting the equipment
  - After storing the equipment
  - After the equipment halt under the conditions which is out of the guranteed environment conditions (Temperature: 10 to 35°C, Humidity: 20 to 80%).

  Check the system clock once in a month. It is recommended to operate the system clock using a time server (NTP server) if it is installed on the system which requires high level of time accuracy. If the system clock goes out of alignment remarkably as time goes by, though the system clock adjustment is performed, contact your sales agent.

- When you store the equipment, keep it under storage environment conditions (Temperature: -10 to 55°C, Humidity: 20 to 80%, non-condensing).

■ If NEC Express5800/ft series, the built-in optional devices, and the 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 breakdown when these are used in such state. In order to protect important stored data and assets, make sure to wait for a sufficient period of time to use the server or components in the operating environment.

Reference: Length of the time effective at avoiding condensation in winter (more than 10°C differences between room temperature and atmospheric temperature)
Disk devices: Approximately 2-3 hours
Tape media: Approximately 1 day

■ Make sure that the optional devices are attachable and connectable to the equipment. There is a risk of malfunctions that could lead to a breakdown of the equipment even if you could attach and connect.

■ Make sure that your options are compatible with the system. If you attach any incompatible option, there is a risk of malfunction that could lead to a breakdown.

■ It is recommended to use NEC's genuine option products. Some competitors' products are compatible with this server. However, servicing for trouble or damage resulting from such a product will be charged even within the warranty period.

TRANSFERRING TO THIRD PARTY

Observe the following notes for transferring the main unit or other embedded devices to third party.

■Main unit
   Attach this manual when you alienate or sell this device.

IMPORTANT:
Data in the hard disk drives:
Make sure to delete all the important data such as client information or corporate accounting information stored in the hard disk drives installed on the device to be alienated.
Operations such as Empty Recycle Bin on VMware, or commands such as formatting seem to delete data completely. However, the data still remains on the hard disk drives. Such undeleted data can be restored by special software, and may be diverted.
To avoid this kind of troubles, it is strongly recommended to use commercial software or services to completely delete the data. For the details on data deletion, contact your local reseller.
We are not responsible for any data leakage from alienating or selling the device if you do not delete the data completely.

■Bundled software
   The following conditions must be satisfied when you alienate or sell the bundled software.

   -   Alienate all the bundled. After alienating, do not save any copy of them.

   -   Alienation or transferring of Software User License Agreement must be satisfied.

   -   For software that alienation or transferring is not allowed, uninstall from the device before alienate it.

DISPOSAL OF EQUIPMENT AND CONSUMABLES

■ When you dispose of the main unit, hard disk drives, floppy disks, DVDs, optional boards, etc., you need to observe your local disposal rules. Dispose the attached power cable along with the equipment to avoid being used with other equipment.

For details, ask your municipal office.

IMPORTANT:
For disposal (or replacement) of batteries on the motherboard, consult with your sales agent.
You are responsible for wiping out such data before disposal. Erase all data on the hard disk, backup data cartridges, floppy disks, or other writable media (such as CD-R and CD-RW); prevent your data from being restored and reused by a 3rd party. You need to exercise sufficient care to protect privacy and confidential information.

■ Some of the system components have limited lifetime (e.g., cooling fans, built-in batteries, built-in DVD-ROM drive, floppy disk drive and mouse). For stable operation, it is recommended to replace them regularly. For lifetime of individual components and replacing procedures, ask your sales agent.

TRANSPORTING DEVICE

This unit and options use lithium-metal battery or lithium-ion battery.
Contact your local reseller for transporting the unit by air or shipping since the regulation is applied to air and maritime transportation of lithium battery

ABOUT OUR WEB SERVICE

Information on NEC Express5800/ft series including modification modules is also available on our web site, NEC Express5800 Web Site Asia Pacific, at
http://www.nec.co.jp/express/index.html

Advice for Your Health

Prolonged use of a computer may affect your health. Keep in mind the following to reduce stresses on your body:

Sit in a good posture
Sit on your chair with your back straight. If the desk height is appropriate, you will slightly look down at the screen and your forearms will be parallel to the floor. This "good" work posture can minimize muscle tension caused by sedentary work.
If you sit in a "bad" posture—for example, sit round-shouldered or with you face too close to the display—you may easily suffer fatigue or have your eyesight affected.

Adjust the installation angle of Display
Most types of displays allow you to adjust the angle vertically and horizontally. This adjustment is very important to prevent the reflection of light as well as to make the screen more comfortable to see. Without this adjustment, it is difficult to maintain a "good" work posture and may get tired soon. Be sure to adjust the angle before using the display.
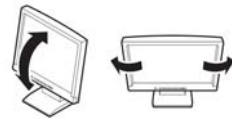
Adjust Brightness and Contrast
Displays allow you to adjust brightness and contrast. Optimum brightness and contrast vary depending on the individual, age, brightness of the room, etc; you need to make an adjustment accordingly. If the screen is too bright or too dark, it is bad for your eyes.

Adjust the installation angle of Keyboard
Some types of keyboards allow you to adjust the angle. If you adjust the angle to make the keyboard more comfortable to use, you can greatly reduce stresses on your shoulders, arms, and fingers.
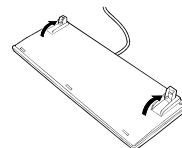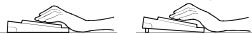
Clean the Equipment
Cleanliness of the equipment is very important not only for reasons of appearance but also from the viewpoints of function and safety. Especially, you need to regularly clean the display, which gets unclear due to the accumulation of dirt.

Take a break when you get tired
If you feel tired, you are recommended to refresh yourself by taking a short break or doing a light exercise.

Chapter 2

General Description

This chapter describes what you need to know to use the NEC Express5800/ft series. Refer to this chapter when you want to know about certain components and how to operate them.

STANDARD FEATURES

The NEC Express5800/ft series is the server that has hardware for two servers.

High performance

- Intel® Xeon® Processor
  (2.00GHz/2.93GHz)

- High-speed Ethernet interface
  (1000Mbps/100Mbps/10Mbps supported)

- High-speed disk access (SAS (Serial
  Attached SCSI))

Various Features

- Graphic accelerator "PILOT2" supported

Expandability

- Various IO optional slots
  - PCI Express REV1.1 (4 lane)
    2 slots (Low Profile)
  - PCI Wxpress REV2.0(4 lane)*
    2 slots (Full Hight)

- Large capacity memory supported
  : Max 96 GB

- USB supported

Self-diagnosis

- Power On Self-Test (POST)

- Test and Diagnosis (T&D) Utility

High-reliability

- Memory monitoring feature (Correctable
  error correction/ Uncorrectable error
  detection)

- Bus parity error detection

- Error notification

- BIOS password feature

Maintainability

- Off-line Maintenance Utility

Management Utilities

- NEC ESMPRO

- DianaScope

Easy and Fine Setup

- NEC EXPRESSBUILDER (System setup
  utility)

- SETUP (BIOS setup utility)

Ready-to-use

- Quick cableless connection: hard disk,
  CPU/IO module

Fault-tolerant Feature

- Redundant modules achieved within a
  system

- Higher hardware availability by isolation of
  failed module

* For R320a-M4 only.

Hardware modules work while synchronizing and comparing with each other. Even if one hardware module stops, the server can continue its operation as the service with the other hardware module.

: New fault-tolerant technology   : Standard product

Even if one hardware module stops, the server can continue operation with the other module. After the failed module is replaced, the new module will obtain information from the other and resume operation.
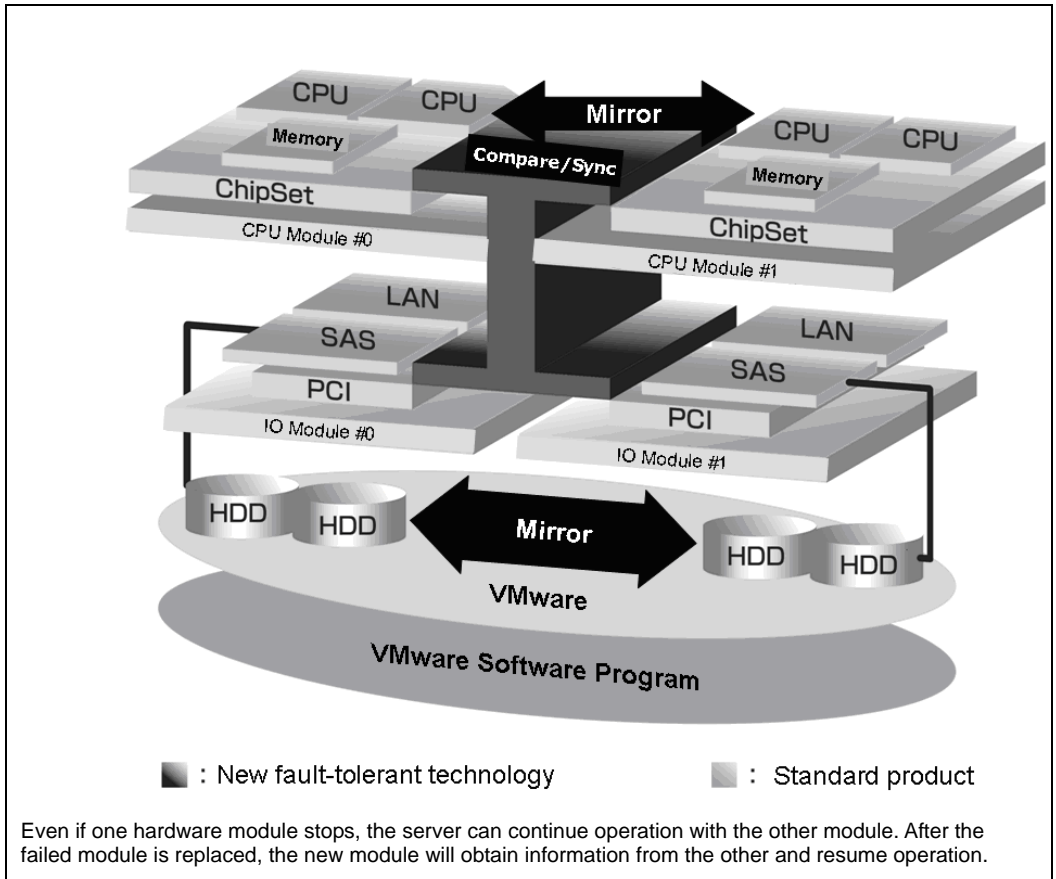
NEC Express5800/ft series is a highly fault-tolerant server that achieves continuous computing operations, data storage mirror, and continuous network connection. It allows you to run ESX-based applications.

NEC Express5800/ft series achieves continuous computing operations for the ESX and server-based applications with its redundant CPU processing and redundant memory. It assures data redundancy through duplication of server data on an independent storage system. These features eliminate server downtime that is usually caused by network disconnection or trouble with the I/O controller, Ethernet adapter or disk drive, and support operation of the network and server applications continuously. While being transparent to application software, NEC Express5800/ft series achieves high fault-tolerance.

NEC Express5800/ft series detects status changes, errors and other events and notifies Syslog of these events. If you use an alarm notification tool, you can configure NEC Express5800/ft series to notify you when certain events occur.

NEC ESMPRO can be installed on the system as a server management solution. NEC ESMPRO, a GUI-based management tool, allows you to monitor, view, and configure NEC Express5800/ft series. This tool also supports both local and remote management of NEC Express5800/ft series.

NEC Express5800/ft series mainly provides the following advantages:

- **Highly fault-tolerant processing and I/O subsystems**

  NEC Express5800/ft series use redundant hardware and software to assure server operation even if one module suffers trouble with its processor, memory, I/O (including trouble related to the I/O controller), disk drive, or Ethernet adapter.

- **Continuous network connection**

  NEC Express5800/ft series maintains continuous network connection by detecting any trouble with the network adapter, connection, etc. If trouble occurs, the standby network connection will take over all network traffic processing and thus securely maintain the network system connection of NEC Express5800/ft series without losing network traffic or client connection.

- **Support of multiple network connections**

  Since NEC Express5800/ft series can support multiple Ethernet connections, you can add network redundant control or network traffic control.

- **Industry standard hardware platform**

  NEC Express5800/ft series uses IA (Intel Architecture)-based system hardware.

- **No need to modify applications**

  You can run applications corresponding on Guest-OS on NEC Express5800/ft series. Thus, unlike other highly fault-tolerant products, special API or scripts are not necessary.

- **Transparent migration**

  NEC Express5800/ft series constantly monitors events. If trouble occurs on NEC Express5800/ft series' server module, it will transparently use a redundant module of the failed module. This feature maintains data and user access without losing application service.

- **Automatic reconfiguration**

  When the failed module restarts after the trouble is corrected, NEC Express5800/ft series will perform reconfiguration automatically, and if necessary, resynchronize the affected modules. Reconfiguration can include CPU processing (e.g., CPU memory), server's operating system (and related applications), and system data stored on the hard disks. In most cases, NEC Express5800/ft series automatically restores redundancy of the server modules after recovery.

- **Local and remote management**

  NEC Express5800/ft series uses NEC ESMPRO as a server management tool. This tool uses a GUI that enables monitoring and setting of NEC Express5800/ft series. NEC ESMPRO can be used both locally and remotely on work station PCs or server PCs.

■   **Syslog function**

When trouble or other events are detected on NEC Express5800/ft series, they will be saved in syslog. You can also use alarm report software such as "Express Report Service" for managing NEC Express5800/ft series. We recommend you to use Express Report
Service for prompt action upon failure. For details, contact your sales agent.

■   **Online repairing**

You can repair or replace a failed module even if NEC Express5800/ft series is operating.

■   **ESX and media**

Although ESX media used on NEC Express5800/ft series are specifically processed for it, the standard operating methods of ESX are same as general.

NAMES AND FUNCTIONS OF COMPONENTS

Names and functions of components are shown below:
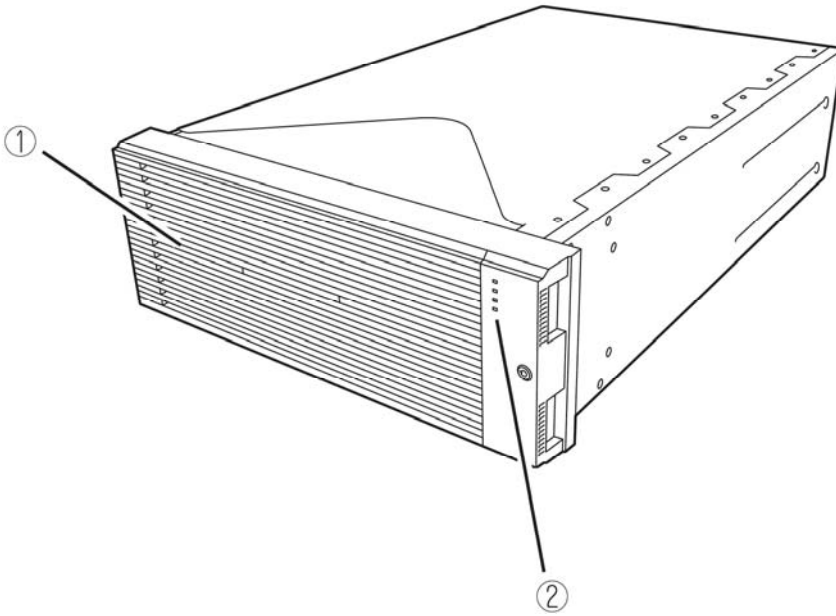
(1)   Front bezel
The cover to protect devices in the front.

(2)   LEDs
For more information, see the description on the front view on page 2-7 and rear view on page 2-9.

Front View
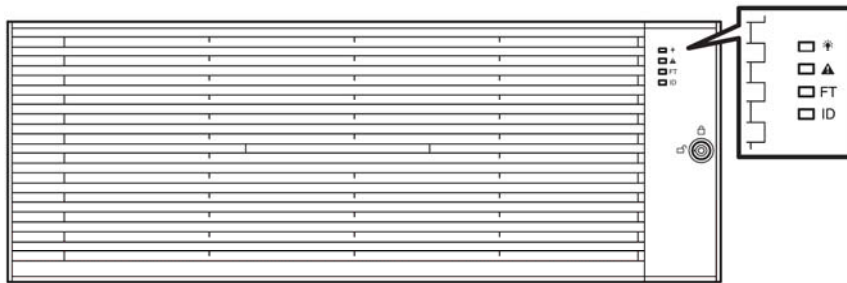
With front bezel attached
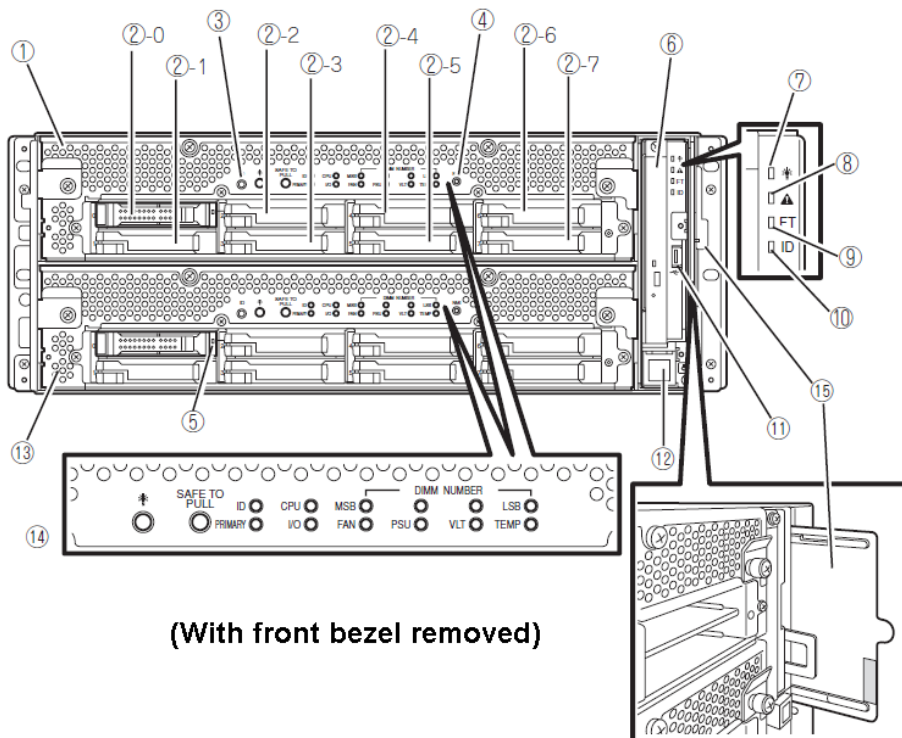
(With front bezel removed)

(1)   CPU/IO module 0
This is a module with a set of CPU (processor), memory (DIMM), PCI board, cooling fan unit, and hard disk drive.

(2)   Hard disk drive bay
This is the bay to mount the hard disk drive. The number after the numbers in parentheses indicates a slot number.

(3)   UID (Unit ID) switch
This is to switch ON/OFF the UID LED on the front of the device.
When processing the switch once, UID LED lights and it goes off when pressing it again.

(4)   Dump (NMI) switch
Memory dump is executed when pressing the button.

(5)   Disk access LED
This LED illuminates while accessing the installed HDD.

(6)   Optical disk drive
This device is used to read data from the disks such as DVDs and CD-ROMs (see page 2-11).

(7)   System POWER LED
This illuminates in green when one of the powers of the CPU/IO modules is ON. LED goes off when both powers of CPU/IO module are OFF.

(8)   System FAULT LED
When one of the CPU/IO modules has an error, the LED illuminates in amber. Details can be confirmed by checking EXPRESSSCOPE. The LED illuminates in amber when it cannot identify which one of the CPU/IO moulds has an error.

(9)   System FT LED
This LED displays the device status. The LED illuminates in green when operating under duplex condition. The LED goes off if it's not duplex.

(10)   System ID LED
The system ID LED illuminates in blue on the front bezel if pressing UID switch when there are multiple devices installed on one rack. This enables to identify the device to be maintained. This LED blinks in blue when there are device identification requests remotely.

(11)   USB connector
It connects with the device supporting USB interface.

(12)   Power switch
This switch is to turn ON/OFF the power. When pressing it once, the power will be ON. When pressing it again, the power will be OFF. Forced shut down takes place when pressing it for 4 seconds or longer.

(13)   CPU/IO module 1
This is a module with a set of CPU (processor), memory (DIMM), PCI board, cooling fan unit, and hard disk drive. The name of each part is the same as CPU/IO module 0.

(14)   EXPRESSSCOPE various LEDs (green/amber)
This LED indicates the status of CPU/IO modules (see page 2-16).

(15)   SLIDE-TAG
A Label where N-Code and Serial number are printed is pasted to this tag.

Rear View
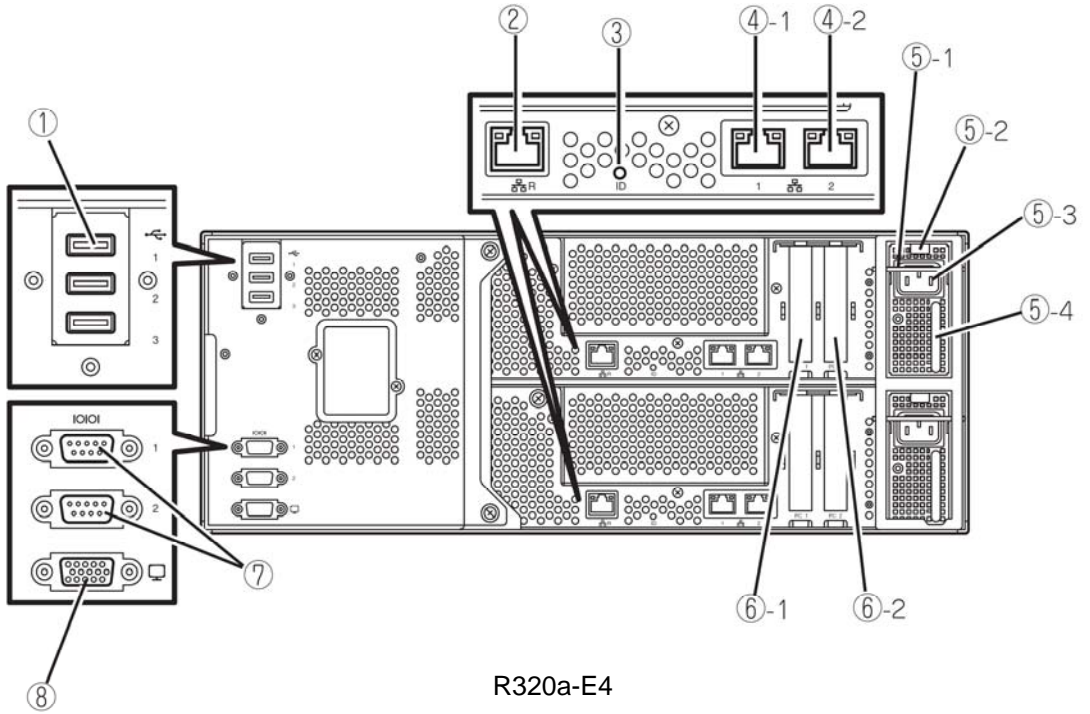
R320a-E4
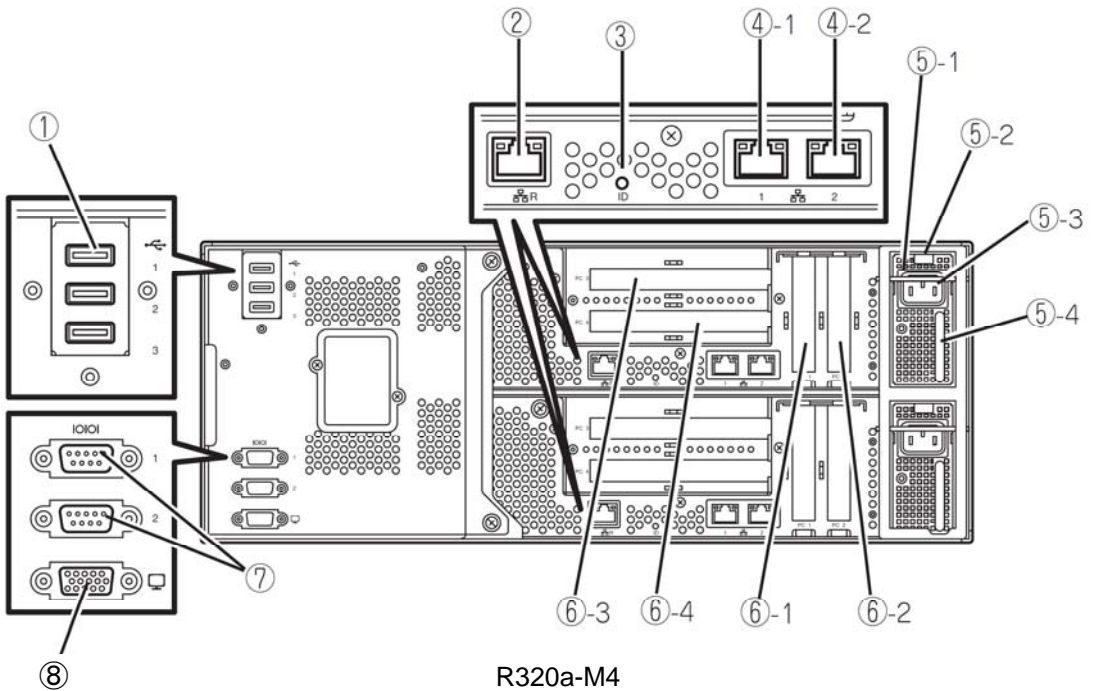
R320a-M4

(1)   USB connector (3 ports)
This connects with the device supporting USB interface.

(2)   Management port
Ethernet connector supporting 100BASE-TX/10BASE-T.

(3)   Module ID(ID LED)
The Module ID LED illuminates in green on side of CPUIO module in back if pressing UID switch when there are multiple devices installed on one rack. This enables to identify the device to be maintained. This LED blinks in green when there are device identification requests remotely.

(4)   LAN connector
This is the connector supporting 1000BASE-T/100BASE-TX/10BASE-T. It connects with the network system on LAN. The number "1" indicates LAN 1 and "2" indicates LAN 2 after the circled numbers.

(5)   Power unit
This is a power unit, a standard equipment.

   (5)-1 Stopper
   This is a lever for the CPU/IO module not to be disconnected with the power code connected. Ensure that the bar is not unset to remove CPU/IO module.

   (5)-2 Ejector

   (5)-3 AC inlet connector
   This is a socket to connect power code. Connect power code to the inlet of CPU/IO module first which is desired to be primary.

   (5)-4 Handle

(6)   PCI slot
This is a slot to mount an optional PCI board (see page 8-30). The number after the circled numbers indicates a slot number.

(7)   Serial Port for maintenance(COM)
Do not use this port. Maintenance personnel only.

(8)   Monitor connector
This is a connector to connect with a display device.

Optical disk drive
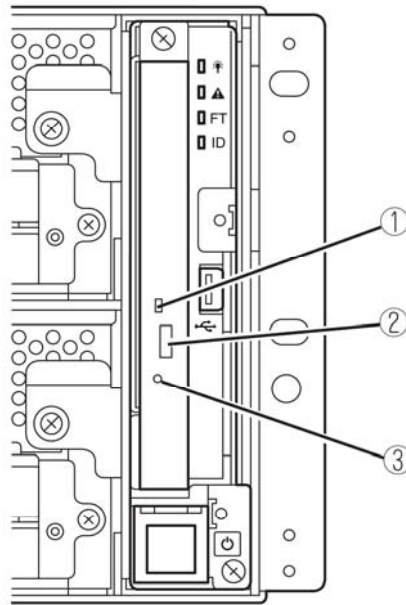
(1)   Status LED
The LED that lights while accessing the loaded DVD/CD-ROM

(2)   Tray eject button
The button to eject the tray.

(3)   Manual release
The hole to be forced to eject DVD tray by pinpricking when optical disk can't be ejected through despite pushing tray eject button.

CPU/IO Module
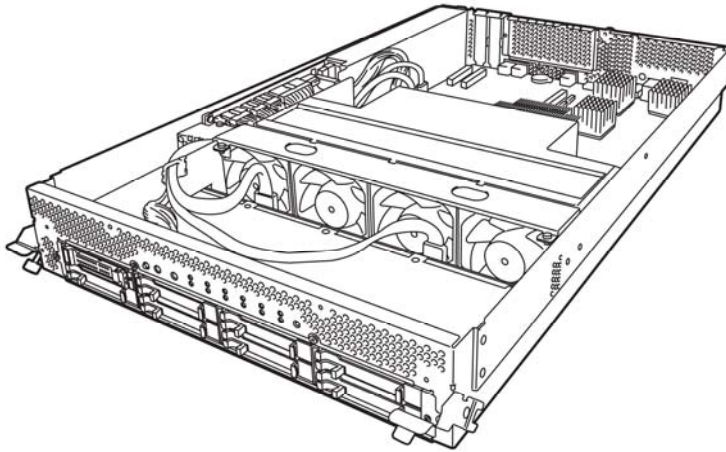
R320a-E4 (top cover removed)
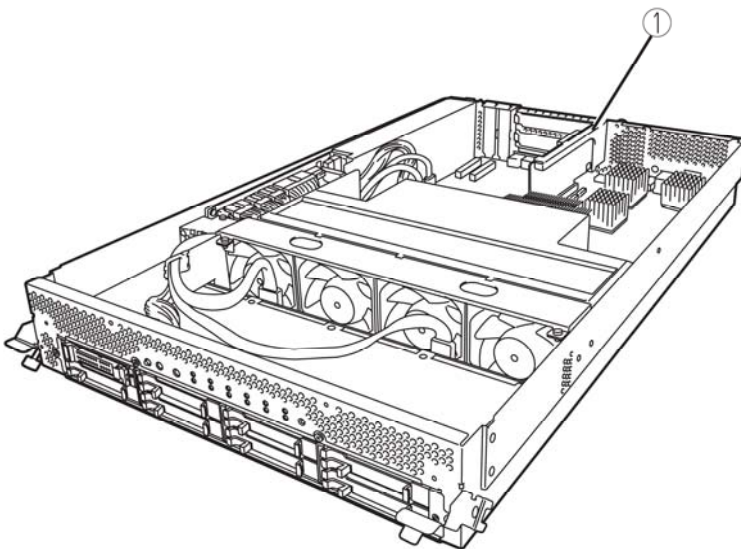
R320a-M4 (top cover removed)

(1) PCI Riser card

Mother Board
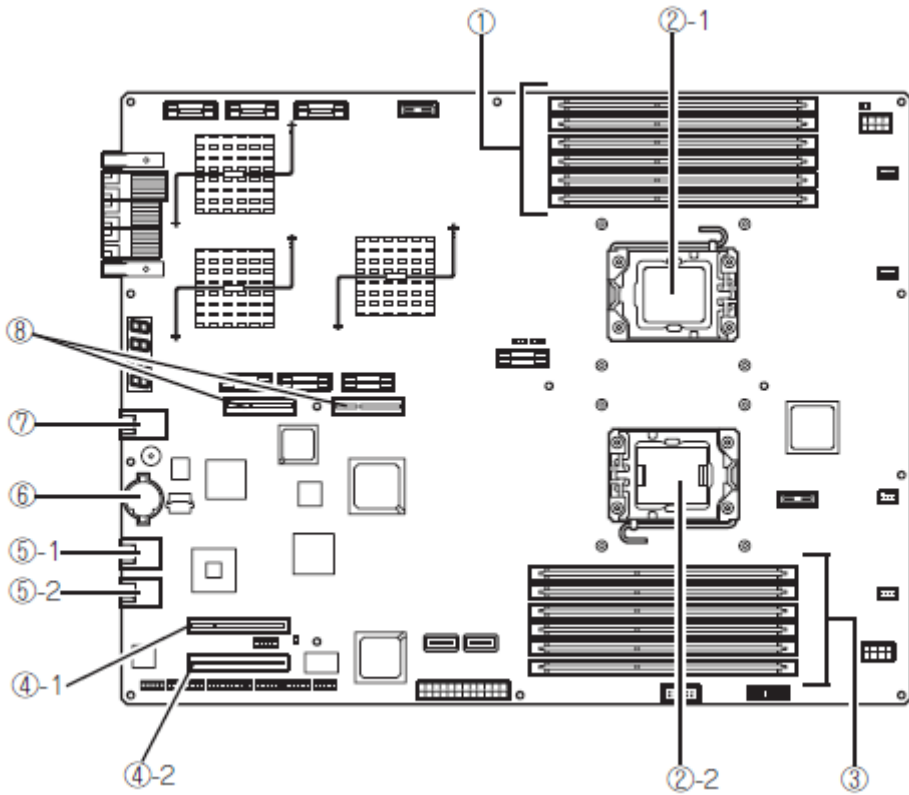
CPU/IO module mother board

(1)	**DIMM slot** DIMM 1 – DIMM6 from the top.	**(5)**	**LAN connector** **(5)-1 LAN1** **(5)-2 LAN2**
(2)	**Processor(CPU) socket** **(2)-1 Processor #1(CPU#1)** **(2)-2 Processor #2(CPU#2)**	**(6)**	**Lithium battery**
(3)	**DIMM slot** DIMM7 – DIMM12 from the bottom.	**(7)**	**Management port**
(4)	**Connector for PCI card** **(4)-1 PCI slot #1** **(4)-2 PCI slot #2**	**(8)**	**Connector for PCI riser card** Used for R320a-M4 model only.

LEDs

System POWER LED

When one of the power of CPU/IP modules is ON, the LED illuminates in green. The LED goes off when both powers of CPU/IO module are OFF.

System FAULT LED

When one of the CPU/IO modules has an error, the LED illuminates in amber. Details can be confirmed by checking EXPRESSSCOPE. The LED illuminates in amber when it cannot identify which one of the CPU/IO modules has an error.

System FT LED

This LED displays the device status. The LED illuminates in green when operating under duplex condition. The LED goes off if it's not duplex. The LED illuminates in green when executing Active Upgrade.

System ID LED

The system ID LED illuminates in bule on the front bezel if pressing UID switch when there are multiple devices installed on one rack. This enables to identify the device to be maintained. This LED blinks in blue when there are device identification requests remotely.

Hard Disk Drive LED

Hard Disk LED	Description	Action
Not on	The disk is in the idle state.	
Green	Accessing the disk	
Amber	Disk failure	Contact a maintenance service company.
Blinking in amber (Illuminate in green when accessing the disk)	The mirror of the disk is disconnected.	Perform mirroring.
Blinking in green and amber in turn	The hard disk drive configuration (rebuild) is on going.	Wait for a while; the LED blinks in green after rebuild finishes. If the rebuild fails, the LED illuminates in amber.

Access LED on the DVD drive

This LED illuminates when the installed DVD or CD-ROM is being accessed.

LAN Connector LED

- LINK/ACT LED

  The LINK/ACT LED shows the status of a standard network port. It is green if power is supplied to the main unit and hub, and they are connected correctly ("LINK"). It blinks green while the network port sends or receives data (ACT).

  When the LED does not illuminate during "LINK," check the condition and connection of network cables. If there is nothing wrong with the cables, a defect is suspected in the network (LAN) controller. In this case, contact your sales agent.

- Speed LED

  This LED indicates the network interface of the communication mode used by a network port.

  1000BASE-T and 100BASE-TX are the supported LAN port types. When this LED illuminates in amber, the port is operating on 1000BASE-T; when in green, 100BASE-TX; and when not illuminate, 10BASE-T.

EXPRESSSCOPE

Corresponding EXPRESSSCOPE LEDs (amber) illuminate when modules have failures.
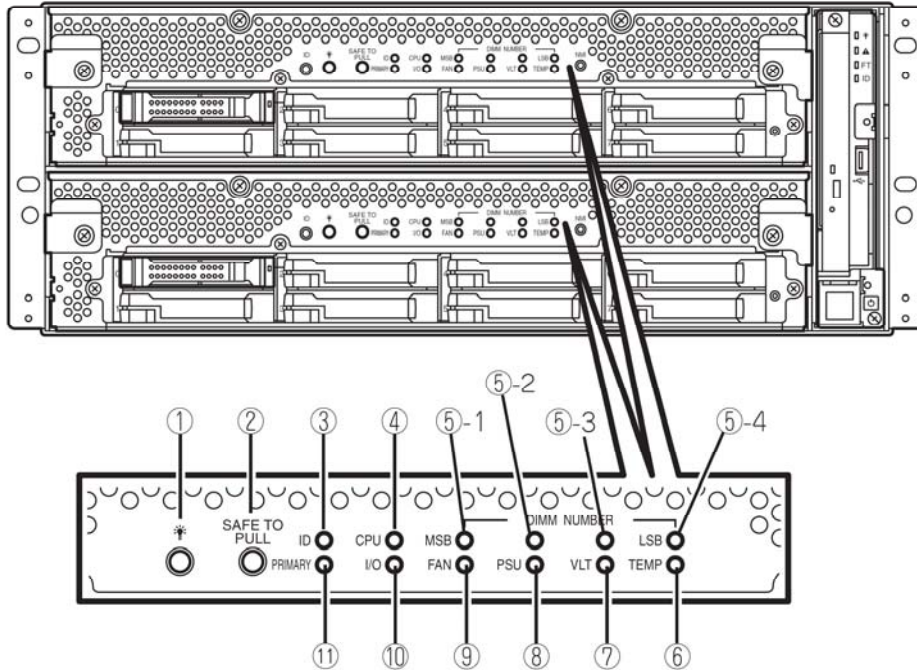
(1)   Module POWER LED
While the power of CPU/IO module is ON, the LED illuminates in green. When the power is not supplied to CPU/IO module, the LED goes off. The LED blinks when standing by.
Amber LED illuminates when failure occurs on CPU of CPU/IO module.

(2)   SAFE TO PULL
This is the LED indicating the possibility to remove CPU/IO module safely. The LED lights in green when it is able to remove CPU/IO module.
The LED blinks in green when it is unable to remove CPU/IO module.
The LED goes off when CPU/IO module is off line and it is able to remove it.

(3)   Module ID(ID LED)
The system ID LED illuminates in green on the front bezel if pressing UID switch when there are multiple devices installed on one rack. This enables to identify the device to be maintained. This LED blinks in blue when there are device identification requests remotely.

(4)   CPU(CPU FAULT LED)
The LED illuminates in amber when the CPU part of CPU/IO modules has an error.

(5)   MEM NUMBER(Memory slot error LED)
Amber LED illuminates when failure occurs on the memory slot 0 of CPU/IO module.
Memory slots with errors can be identified by illumination status of the following (5)-1
to 4.

Each Memory Slot Error LED Status				Description
5-1 (MSB)	5-2	5-3	5-4 (LSB)	
-	-	-	-	Operating normally.
-	-	-	√	An error occurred on memory slot 1.
-	-	√	-	An error occurred on memory slot 2.
-	-	√	√	An error occurred on memory slot 3.
-	√	-	-	An error occurred on memory slot 4.
-	√	-	√	An error occurred on memory slot 5.
-	√	√	-	An error occurred on memory slot 6.
-	√	√	√	An error occurred on memory slot 7.
√	-	-	-	An error occurred on memory slot 8.
√	-	-	√	An error occurred on memory slot 9.
√	-	√	-	An error occurred on memory slot 10.
√	-	√	√	An error occurred on memory slot 11.
√	√	-	-	An error occurred on memory slot 12.
√	√	√	√	An error occurred on unknown memory slot.

√   LED is lit.
-    LED is not lit.

(6)   TMP (Abnormal temperature LED)
The LED lights in amber when temperature in CPU/IO module becomes abnormal.

(7)   VLT (Power error LED)
The LED lights in amber when electric voltage failure occurs in CPU/IO module.

(8)   PSU(Power supply unit error LED)
The LED lights in amber when failure occurs on the power supply unit of CPU/IO
module.

(9)   FAN (Fan error LED)
The LED lights in amber when failure occurs on the cooling fan for CPU of CPU/IO
module.

(10)   I/O(I/O FAULT LED)
The LED lights in amber when failure occurs on the I/O part of CPU/IO module.

(11)   PRIMARY(Primary LED)
The LED lights in green when CPU/IO module is primary.

Power Unit LED

There is a power unit LED in the power unit on the rear. The LED blinks in green when connecting the power code to AC inlet and the power unit receives the power. The LED illuminates in green when turning the power of the device

The power unit may be failing if the LED does not illuminate in green or the LED illuminates or blinks in amber when turning the switch ON. Contact your sales agent to have the power unit replaced.

BASIC OPERATION

This section describes basic operation procedures of NEC Express5800/ft series.

Installing/removing the front bezel

When you power on/off the server, handle the DVD-ROM drive, or remove/install a hard disk drive or CPU/IO module, remove the front bezel.

IMPORTANT: The front bezel can only be removed by unlocking the lock with the security key attached. bezel.

1. Insert the product-accessory security key into the key slot and push lightly. Turn the key to the left to unlock.

2. Hold the right edge of the front bezel and pull it forward.

3. Slide the front bezel to take the tab off the frame and remove the front bezel.
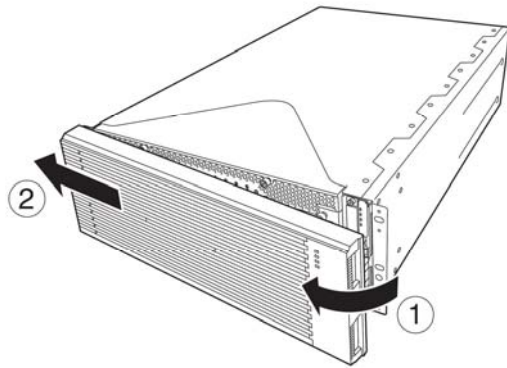
When attaching the front bezel, hook the left tab into the server's frame first, then push forward on the right side.
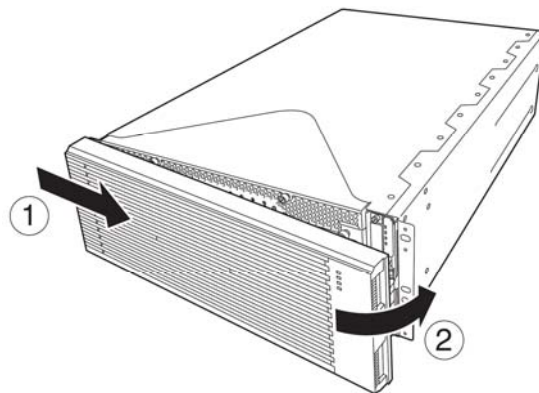
Power ON

To power on NEC Express5800/ft series, press the POWER switch (the one whose in-built LED is lit).

Follow the steps below to turn on the power.

1. Power on the display unit and other peripheral devices connected to the server.

> **CHECK:** If the power code is connected to a power controller like a UPS, ensure that it is powered on.

2. Remove the front bezel.

3. Press the power switch located on the front panel. Lift up the acrylic cover in front of the power switch, and press power switch of the front panel.

After a while, the "NEC" logo will appear on the screen.

> **IMPORTANT:** Do not turn off the power before you see the "NEC" logo and a character below the logo.

Acrylic cover

Power Switch
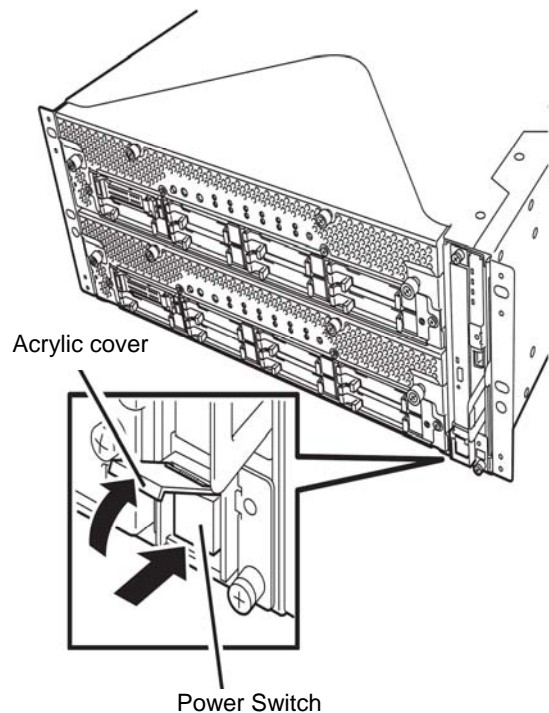
While the "NEC" logo is displayed on the screen, NEC Express5800/ft series is performing a power-on self test (POST) to check itself. For details, see "POST Check" described later in this chapter.
Upon the completion of POST, OS will start.

> **CHECK:** If the server finds errors during POST, it will interrupt POST and display the error message. See Chapter 7.

Power OFF

Follow the steps below to turn off the power. If NEC Express5800/ft series is plugged to a UPS, see manuals included with the UPS or the application that controls the UPS.

1. Perform a normal shutdown from ESX.

    The system will be powered off automatically. (Note: the POWER switch on the primary side will remain illuminating when AC power is supplied.)

    CHECK: The server can't be automatically turned off even if shutdown procedure before installing the ft control software. In this case, it is necessary to long push power switch button to turn off the server after time passes enough since "The system is going down for system halt NOW!" has been displayed on the screen.

2. Power off all peripheral devices.

POST Check

POST (power-on self test) is a self-test function stored on the motherboard of NEC Express5800/ft series.

When you power on the server, POST will start automatically to check the motherboard, ECC memory modules, CPU/IO modules, keyboard, mouse, etc. It also shows startup messages for various BIOS setup utilities.

$$NEC$$

According to the factory default settings, the "NEC" logo appears on the display while POST is being performed. (To view details of POST, press **Esc**.)

> **TIPS:**
> ■ You can view POST details from the beginning without pressing **Esc** key when the BIOS menu appears. Select [System Configuration] – [Advanced] and set [Boot-time Diagnostic Screen] to "Enabled" (see Chapter 4).
> ■ You can view the test items and details from a management PC where ESMPRO Manager is installed.

You do not always need to check POST details. You will need to check messages when:

■   You install a new NEC Express5800/ft series.

■   A failure is suspected.

■   You hear several beeps between the time of the power-on and OS start-up.

■   The display unit shows an error message.

Flow of POST

This section walks you through how POST is performed.

1. When you power on the system, one selected CPU/IO module will start up.

POST will be performed on this selected CPU/IO module.

2. Memory check starts.

A message appears at the upper left of the screen to show that the basic and expanded memories are being counted. The memory check may take a few minutes to complete depending on the server's memory size. Likewise, it may take about one minute for the screen to appear when the server is rebooted.

3. The server starts processor check, IO check, and initialization.

Several messages appear: they show the ID of the selected CPU/IO modules, information on the processor, detection of the keyboard and mouse, etc.

4. A message appears at the lower left of the screen, prompting for startup of the BIOS setup utility "SETUP."

Press <F2> to enter SETUP

You will need to start it when you want to modify the configuration for using the server. Unless this message appears together with an error message, you do not need to start the utility to modify the configuration. (If you wait for a few seconds, POST will go on automatically.)

To start the SETUP utility, press **F2** while the above message is displayed. For setting and parameter functions, see the section of BIOS setup.

When SETUP is completed, the server will reboot itself automatically and perform POST.

5. A message appears prompting for startup of SAS BIOS setup utility.

When a built-in SAS controller is detected, a message will appear prompting for startup of SAS BIOS setup utility. (If you wait for a few seconds, POST will go on automatically.)

If you press **Ctrl** + **A**, the SAS BIOS setup utility will start. However, you usually do not need to use the setup utility. For setting and parameter functions, see "SAS BIOS" (page 4-36).

When SETUP is complete, the server will reboot automatically and perform POST from the start again.

6. The screen shows the ID numbers of the connected disk drive.

7.   Upon completion of POST, the password entry screen appears prior to OS startup.

The password entry screen will appear after the normal termination of POST only if you have set a password in the BIOS setup utility "SETUP."

You can enter a password up to three times. If you enter an incorrect password three times, the startup will be unsuccessful. In this case, turn off the power and then turn it on again after waiting 30 seconds to boot the server.

> **IMPORTANT:** Set a password after the OS installation.

8.   Upon completion of POST, the OS will start up.

Behavior at Occurrence of Error

If POST or OS startup does not finish normally, the server will reboot itself automatically.

At the time of reboot, it will select the other CPU/IO module and run POST or OS startup.

In this manner, the server retries POST or OS startup with different combinations of CPU/IO modules. If POST does not finish normally with any combinations, the server will stop with the state of DC OFF or Post end with an error message displayed.

While performing retries, the server displays or registers the error types.

For details of error messages, see Chapter 7 "Troubleshooting."

POST Error Messages

When the server detects an error during POST, it will notify you of the occurrence in the following manners:

■   Displays an error message on the display unit.

These notification methods are described in "POST Error Messages" (Page 7-4).

> **IMPORTANT:** Before you contact your sales agent, write down the error messages. They will serve as helpful information at the time of maintenance.

CPU/IO Module Status

The CPU/IO module (0 or 1) started first is managed as primary, and the module started later is managed as secondary. If one CPU/IO module is disconnected because of the failure and others, theother module becomes primary.

The CPU/IO module to be started first is selected depending on the primary/secondary status of modules when the server was shut down the last time. When the server is started for the first time after power OFF, the CPU/IO module which was powered ON first becomes primary.

Notes on optical disk drive

After ft control software is installed, an optical disk drive becomes inaccessible. When accessing to an optical disk drive is necessary, follow the procedure below to temporarily allow access to the drive.

/opt/ft/sbin/enable-usb-storage

Use of optical disk drive in normal operation is not recommended. Do not operate the server while using the optical disk drive, such as mounting on service console or allocating to guest OS.

When an optical disk drive is used during the system operation, the product may not work properly. If an optical disk drive is used, remove the mounted / allocating optical disk drive and reboot the system.

Floppy Disk Drive (Option)

If you want to use a floppy disk drive with this server, connect N8160-81USB FDD UNIT, which are available optionally to a USB connector.

CHECK:

ESX4 does not support USB floppy disk drives.

Insert/Remove Floppy Disk

Before inserting a floppy disk into the drive, make sure that NEC Express5800/ft series is on (the POWER LED illuminates).

Insert a floppy disk into the drive firmly until it snaps in place. The eject button of the drive is then raised slightly.

CHECK:

- You cannot use 1.2 MB-formatted disks.

- If you insert an formatted disk, you will see a message that the disk cannot be read or that needs formatting. To format a floppy disk, refer to your OS manual.

- If you power on or restart NEC Express5800/ft series with a floppy disk left in the drive, the server will access the floppy disk to start the system. Unless a system exits on the FD, the server will be unable to start.

To remove a floppy disk from the drive, press the eject button.

IMPORTANT:

- Before removing a floppy disk, ensure that the floppy disk access LED is off. If you eject a floppy disk while the LED is lit, the stored data could be damaged.

- When using a USB floppy disk drive, access to the floppy disk is delayed on rare occasions if the display graphic load is high because a moving picture is being displayed. In such a case, retry the operation with the floppy disk inside the floppy disk drive.

Use of Floppy Disk

You may need to store important data on floppy disks. Since the floppy disk is a very delicate medium, you must handle it with extra care:

- Push the floppy disk gently into place.

- Attach the label on a proper position.

- Do not use a pencil or ballpoint pen to write on the floppy disk.

- Do not open the protective shutter.

- Do not use the floppy disk in a dusty place.

- Do not place anything on the floppy disk.

- Do not leave the floppy disk in a place that is subject to direct sunlight or high temperatures (e.g., near a heater).

- Keep away from cigarette smoke.

- Do not leave the floppy disk near water or chemicals.

- Keep away from magnetic objects.

- Do not clip disks. Be careful not to drop.

- Store floppy disks in a protective case where they are kept away from magnetic waves or dust.

- To prevent data from being erased accidentally, the floppy disk has a write-protect notch. When the disk is write-protected, you can read data, but you cannot write the data or format the disk. It is recommendable to write-protect floppy disks that contain important data except when you write data to the floppy disk. To write-protect a 3.5-inch floppy disk, slide the write-protect notch located on its back.

Write Protect Switch   Write Disabled   Write Enabled

- The floppy disk is a very delicate storage medium. Dust or changes in temperature could cause data to be lost. Data loss could also be caused by faulty operation and computer trouble. To avoid such possible data loss, it is recommendable to back up important data regularly. (Be sure to make back-up copies of the floppy disks that are included with NEC Express5800/ft series.)
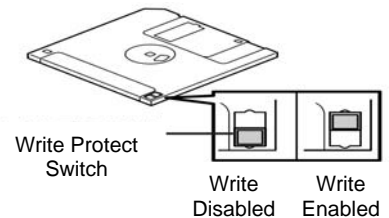
DVD drive

NEC Express5800/ft series has a DVD drive on the front panel. It is a device used to read/write data for an optical disk. Compared to a floppy disk, an optical disk allows for larger volume and fast data readout.

⚠ **CAUTION**
⚠ 🚫 Observe the following instructions to use the server safely. There are risks of a burn, injury, or damage to physical assets. For details, see "PRECAUTIONS FOR SAFETY" in Chapter 1. ■ Do not leave the DVD drive tray ejected.

Insert/Remove Optical Disk

Follow the steps below to set an optical disk.

1. Before you insert an optical disk, make sure that the server is powered on. When the server is powered on, the LED lights in green.

2. Press the tray-eject button located in the front of the DVD-ROM drive. The tray is then ejected.

3. Hold the optical disk with its signaling side facing the tray.

4. As shown in the figure on the right, place the optical disk on the tray and press lightly on the center to lock.

5. Push the front side of the tray gently to the drive-closed position.
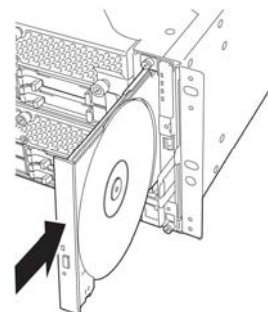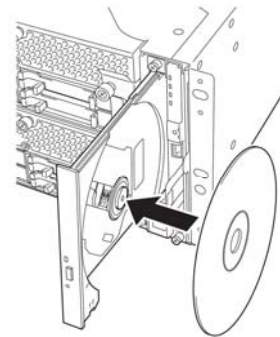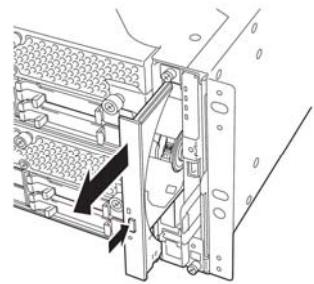
> **IMPORTANT:**
>
> If you hear noise while running the DVD-ROM drive, reset the optical disk.

To remove the optical disk, press the tray-eject button as you did in setting the optical disk.

When the access LED illuminates in green, it indicates the optical disk is being accessed. Make sure the access LED is not illuminating in green before you press the tray-eject button.

Press the locking part in the center of the tray and pick the optical disk gently. When you have removed the optical disk, push the tray to the drive-closed position.
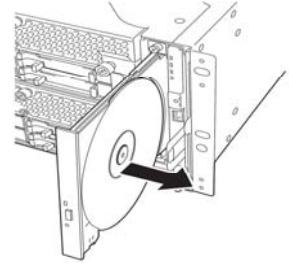
When you cannot eject a Optical media.

When you cannot eject the optical disk from the server even by pressing the eject button, follow the steps below to eject it:

1. Press the POWER switch to power off this server (i.e. the POWER LED is off).

2. Use a metal pin of about 1.2 mm in diameter and 100 mm long (alternatively, you can use a fairly large paper clip after straightening). Insert it gently into the manual release hole located at the low front side of the server until the tray is ejected.
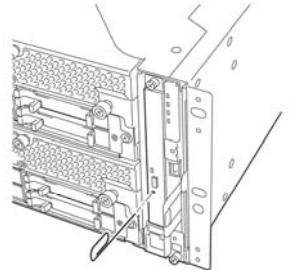
IMPORTANT:

■ Do not use a toothpick, plastic pin, or other breakable objects.

■ If you cannot eject the optical disk by following the steps above, contact your sales agent.

---

3. Hold the tray and pull it out.

4. Take out the optical disk.

5. Push the tray back.

Handling optical disks

Observe the following when you use an optical disk on NEC Express5800/ft series:

- As for a disk such as a noncompliant "copy-protected CD," we shall not guarantee that you can use a CD player to play it with this server.

- Be careful not to drop the optical disk.

- Do not bend or place anything on the optical disk.

- Do not attach labels on the optical disk.

- Do not touch the signal side (blank side).

- Place the optical disk gently on the tray with the printed side up.

- Do not scratch, or use a pencil or ballpoint pen to write on the optical disk.

- Keep away from cigarette smoke.

- Do not leave the optical disk in a place that is subject to direct sunlight or high temperatures (e.g., due to a heater).

- If the optical disk becomes dirty with dust or fingerprints, wipe it gently from its center to edge with a dry soft cloth.

- When you clean the optical disk, use the cleaner expressly meant for it. Do not use a record cleaner (spray), benzine, or thinner.

- Store the optical disk in a protective case when not in use.

Chapter 3

ESX Operation and Configuration

This chapter describes setup and operation specific to NEC Express5800/ft series on ESX. CPU/IO module has a processor function part and IO function part. In utilities in this chapter, the processor function part is referred to as CPU module and IO function part PCI module.

DISK OPERATIONS

NEC Express5800/ft series duplicates disks to secure data integrity by Software-RAID.

IMPORTANT:

It is recommended to create only a system partition on the disks with ESX.

When you have created the VMFS data store area on the disk with the ESX, note that all area of the disk is cleared at the time of the reinstallation of the ESX.

Operable disk configuration

RAID must be configured for all the internal disks in NEC Express5800/ft series.

As shown on the chart1, the internal disks redundancy is configured by software RAID with the internal disks of corresponding slots.

The internal disks path and device name
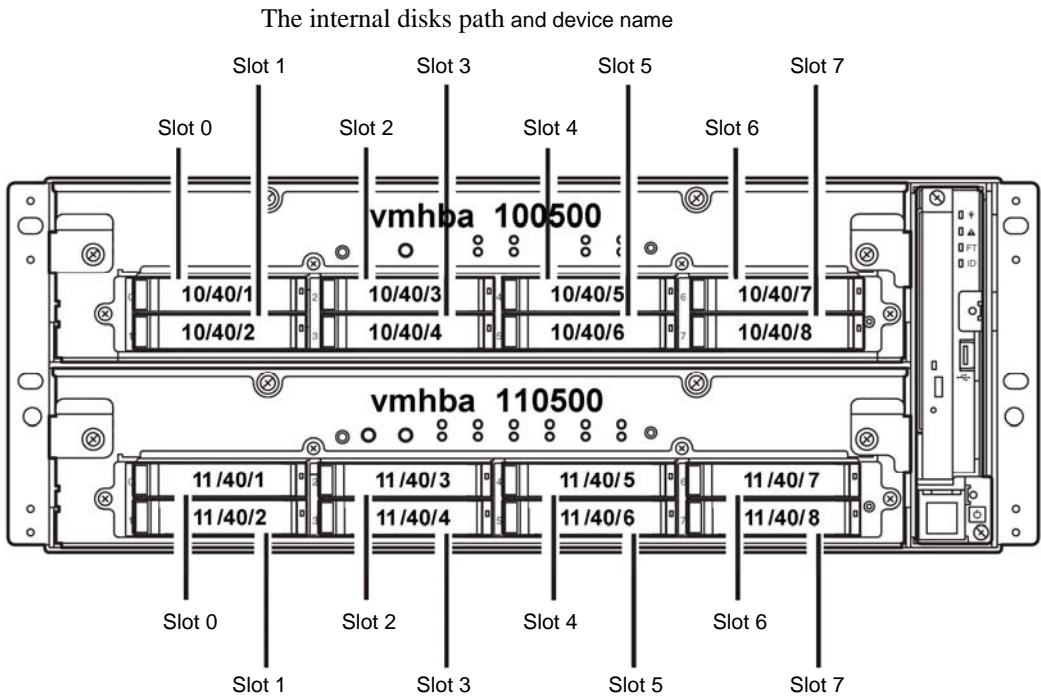
Chart1 Slots corresponding to the mirroring process

Corresponding slot
Slot 0 (10/40/1) ⇔ Slot 0 (11/40/1) Slot 1 (10/40/2) ⇔ Slot 1 (11/40/2) Slot 2 (10/40/3) ⇔ Slot 2 (11/40/3) Slot 3 (10/40/4) ⇔ Slot 3 (11/40/4) Slot 4 (10/40/5) ⇔ Slot 4 (11/40/5) Slot 5 (10/40/6) ⇔ Slot 5 (11/40/6) Slot 6 (10/40/7) ⇔ Slot 6 (11/40/7) Slot 7 (10/40/8) ⇔ Slot 7 (11/40/8)

To operate the internal disk. it need to use the Kernel device names.
The kernel device name is decided by being detected by system when the disk is inserted or system is booted. The kernel device name is displayed as "vmhbann0500:C0:Tx.L0".
The "nn" of "vmhbann0500:C0:Tx.L0" displays PCI Modules(10,11),and "x" that number more than 0 are assigned by detection order displays target number.

You can confirm the kernel device name corresponding to the slot by using "/opt/ft/bin/ftsmaint" command.
If you need to confirm the kernel device name of internal disk inserting in the slot2, carry out the following command such as example.

```
# /opt/ft/bin/ftsmaint ls 10/40/2
H/W Path             : 10/40/2
Description          : Disk Drive
State                : ONLINE
Op State             : DUPLEX
Reason               : NONE
Modelx               : SEAGATE: ST973452SS
Firmware Rev         : 0005
Serial #             : 3TA02A9M00009929YFLA
Device Name          : disk_b
Udev Device Names    : -
Kernel Device Names  : vmhba100500:C0:T1:L0
```
*In above example, the kernel device name is "vmhba100500:C0:Tx.L0".

Configuring the redundant configuration, it is necessary to use "mpmadm" command.
On this occasion, the RAID device name is expressed as "mpm*n*"("*n*" is 0~7)

The internal disks path and device name
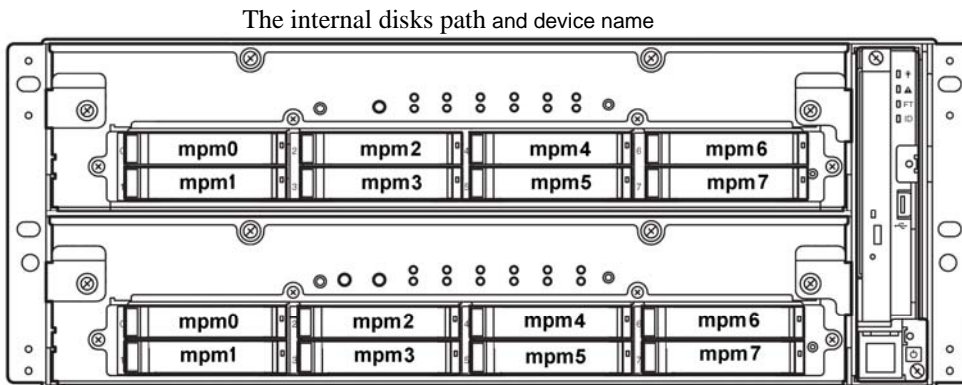
IMPORTANT:

When the status of each disk becomes RESYNC, RECOVERY, CHECK or REPAIR, do not add
a disk, insert/remove HDD, power off or restart the system. Wait until the status indication of
Raid device disappears and the status of each disks become "in_sync". Check the status of
RAID using the "mpmadm" command, which is described later in this document.

Use only the hard disk drives specified by NEC. There is a risk of hard disk as well as the entire
device breakdown when you install a third-party hard disk drive.

Purchase two, paired hard disk drive of the same model to configure the hard drive redundancy.
For information on which HDD suits this device the best, ask your sales agent.

To confirm the disk status, use "/opt/ft/sbin/mpmadm -l" command.
The following display is an example when "/opt/ft/sbin/mpmadm -l" is executed.

```
# cd /opt/ft/sbin/
# ./mpmadm -l
mpm0 [2/2]
 |_ vmhba110500:C0:T0:L0          [ in_sync ]
 |_ vmhba100500:C0:T0:L0          [ in_sync ]
```

Replacing a hard disk drive

To replace a failing hard disk, follow the steps below. Replace a hard disk when the CPU/IO module 0 and 1 are powered on.

Determining a failing disk

This section provides information on how to determine a failing hard disk drive.

IMPORTANT:

This must be operated by root user.

---

1. Execute "mpmadm -l"commands.
2. Check the failed disk form the displayed info.

The following is an example when a failure occurred on the internal disk stored in the slot 0 of PCI module 1.

```
# cd /opt/ft/sbin/
# ./mpmadm -l
mpm0 [2/2]
 |_ vmhba110500:C0:T0:L0          [ faulty ]
 |_ vmhba100500:C0:T0:L0          [ in_sync ]
```

When you confirm the slot0 of PCI Module1 by "/opt/ft/bin/ftsmaint ls" command, it is displayed as follows.

```
# cd /opt/ft/bin/
# ./ftsmaint ls 11/40/1

H/W Path                  : 11/40/1
Description             : Disk Drive
State                   : BROKEN
Op State                : SHOT
Reason                   : NONE
· · · ·                  · · · ·
· · · ·                  · · · ·
```

Restoring the redundant configuration manually

This section provides information on how to replace a failing internal disk and restore duplication.

IMPORTANT:

This must be operated by root user.

While the replaced disk is restoring to the RAID configuration, do not stop/restart the system when the reconfigured each RAID device is in RECOVERY. Wait until the status indication of them disappears and the status of each disks become "in_sync".(It comes to take time depending on disk space.)

---

1. In executing the commands "mpmadm −f" and " mpmadm −r" with setting the RAID device name and the Kernel device name of disk , the disk is isolated from the RAID configuration.

2. Remove the disk from the system, and then, insert a new disk.

3. Wait approximately five minutes until the system automatically performs resynchronization.

4. If the system does not perform resynchronization automatically in step 3, recover RAID manually by executing the commands "mpmadm −a" with setting the RAID device name and the Kernel device name of disk.

The following is an example of command prompt for the procedure from isolating the internal disk stored in the slot 1 of PCI Module 1

```
# cd /opt/ft/sbin/
# ./mpmadm -l
mpm0 [2/2]
 |_ vmhba110500:C0:T0:L0          [ in_sync ]
 |_ vmhba100500:C0:T0:L0          [ in_sync ]

(Isolate the disk from the RAID configuration by specifying the Kernel Device name of
slot 0 of PCI Module)

# ./mpmadm -f mpm0 vmhba110500:C0:T0:L0
Successfully set disk vmhba110500:C0:T0:L0 faulty in volume mpm0.

# ./mpmadm -r mpm0 vmhba110500:C0:T0:L0
Successfully removed disk vmhba110500:C0:T0:L0 from volume mpm0.
```

```
(Check if the disk specified is isolated from the RAID configuration.)

# ./mpmadm -l
mpm0 [1/2]
 |_ vmhba100500:C0:T0:L0           [ in_sync ]
```

```
Unused disks:
- vmhba110500:C0:T0:L0

(After verifying the isolation of the specified disk from the RAID configuration
("after confirming that Unused disks" is displayed), replace the hard disk.
Wait approximately five minute before the system starts to resynchronize. If there
is no automatic synchronization, manually restore the disk with the below
procedure.)

# ./mpmadm -l
mpm0 [1/2]
 |_ vmhba100500:C0:T0:L0          [ in_sync ]

(Check if the replaced disk is recognized by the system.)

# ./mpmadm -l
mpm0 [1/2]
 |_ vmhba100500:C0:T0:L0          [ in_sync ]

Unused disks:
- vmhba110500:C0:T1:L0

(If the system does not synchronize in the replaced disk automatically, execute
the below command to restore to the RAID configuration manually.)

# ./mpmadm -a mpm0 vmhba110500:C0:T1:L0
Successfully added disk vmhba110500:C0:T1:L0 to volume mpm0.

(Check if the resynchronization process is started.)

# ./mpmadm -l
mpm0 [2/2] recover=0.6% (455808/71484736) finish=18.1min (65115K/s)
 |_ vmhba110500:C0:T1:L0          [ syncing ]
 |_ vmhba100500:C0:T0:L0          [ in_sync ]

(Perform restoration (RECOVERY) to each RAID devices (mpm). After a while,
check the Status with the below command. "syncing" shows to be in the process
of restoring.)

# ./mpmadm -l
mpm0 [2/2]
 |_ vmhba110500:C0:T1:L0          [ in_sync ]
 |_ vmhba100500:C0:T0:L0          [ in_sync ]

(When the each RAID device Status is "in_sysnc" and Raid device( mpm ) is not
displasyed, the RAID configuration is restored normally. This ends the disk
replacement procedure.)
```

DUPLEX LAN CONFIGURATION

The operable network configuration is described here..

Functional Overview

Duplicating a LAN is achieved by binding multiple adapters to the same virtual switch (NIC teaming). If an uplink adapter fails, it switches to another adapter to continue the operation.

Operable Network Configuration

For NEC Express5800/ft series, network interface names are based on the naming convention as described in the table below. Network duplication is achieved by pairing network interfaces of PCI slots in CPU/IO module 0 and network interfaces in the same PCI slots in CPU/IO module 1 (i.e. Two network interfaces are bound to a switch). You can configure the setting of and check the network interfaces from Vsphere client.

For more specific setting method, see VMware Vsphere document "ESX Configuration Guide".

If **NIC Teaming** configuration is set **Route based on ip hash**, it may cause disconnected network for 30 seconds in the maximum when the failover occurs due to failure so on.
It is necessary to be used after carefully examining the setting of application and client.

And if **Load Balancing** is set **Route based on source MAC hash** or **Route based on the originating port ID**, it may cause temporarily disconnected network for VMware specific when the failover occurs.
It is necessary to be used after setting **Beacon Probing** from **Failover Detection.**

PCI slot and network interface name

PCI slot	Port	CPU/IO module 0	CPU/IO module 1
On Board	#1	vmnic 100600	vmnic 110600
	#2	vmnic 100601	vmnic 110601
PCI-e slot 1	#1	vmnic 100100	vmnic 110100
	#2	vmnic 100101	vmnic 110101
PCI-e slot 2	#1	vmnic 100200	vmnic 110200
	#2	vmnic 100201	vmnic 110201
PCI-e slot 3	#1	vmnic 100300	vmnic 110300
	#2	vmnic 100301	vmnic 110301
PCI-e slot 4	#1	vmnic 100400	vmnic 110400
	#2	vmnic 100401	vmnic 110401

CHECKING THE DUPLICATING OPERATION OF MODULES

This section describes how to check if the system runs properly after system installation or reinstallation. CPU/IO module has a processor function part and IO function part. Each part is monitored and managed by the module. In this section, the processor function part is referred to as CPU module and IO function part PCI module.

Evaluate Startup and Stop of PCI Modules

This section describes how to confirm the continuous system operation by failover after stopping the primary PCI module.

1. Check which is the primary PCI module.
The PCI module with the POWER switch illuminated is the primary module.

2. Check whether the PCI modules are duplicated.
To check if the PCI modules are duplicated, see the CPU/IO modules' status LEDs.
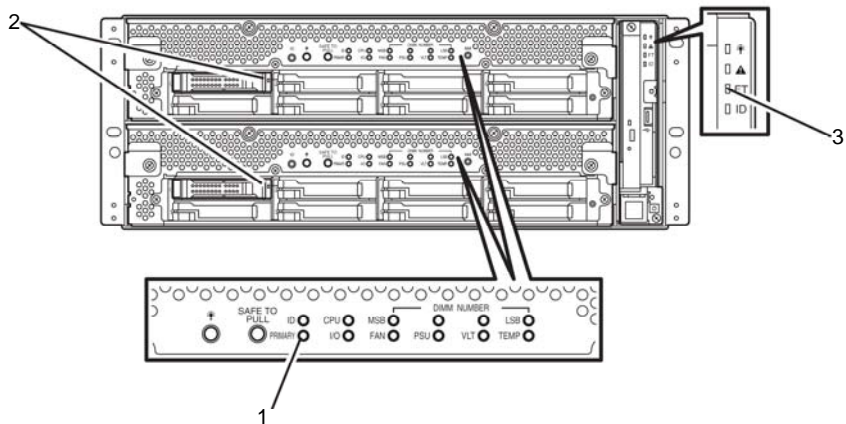
[Indications of the status LEDs when PCI modules are duplicated]

	LED	Primary	Secondary
1	PRIMARY LED	Green	-
2	DISK ACCESS LED	Green	Green

	LED	System
3	System FT LED	Green

3. Stop the operation of the primary PCI module using the ftsmaint Command.

If the PCI Module 0 is primary, execute the following command.

```
# cd /opt/ft/bin
# ./ftsmaint bringdown 10    (*)
```

*As for the primary PCI Module(*),if the PCI Module 0 is primary select[PCI Module(ID:10)].If the PCI module 1 is primary, select[PCI Module(ID:11)].

When you stop the operation of the primary PCI module, failover occurs and the secondary PCI module becomes the primary module.

The PCI modules'status LEDs changes as shown below:

[Indications of status LED]

	LED	Secondary*	Primary*
1	PRIMARY LED	-	Green
2	DISK ACCESS LED	-	Amber or Green blinking (Green when accessing to HDD)

	LED	System
3	System FT LED	─

*indicating primary or secondary after failover.

4. Restart the PCI module.

If the PCI Module 0 was stopped in the step 3, execute the following command and the PCI module will be started.

    # cd /opt/ft/bin
    # ./ftsmaint bringup 10

Once the PCI module is started, PCI module diagnosis, mirror volume duplication and PCI module duplication are performed.

The PCI modules' status LEDs changes as shown below:

[Indications of status LEDs]
Immediately after the PCI module startup until the completion of diagnosis:

	LED	Secondary*	Primary*
1	PRIMARY LED	-	Green
2	DISK ACCESS LED	-	Amber or Green blinking (Green when accessing to HDD)

	LED	System
3	System FT LED	—

When duplication of disks is started after the completion of PCI module diagnosis:

	LED	Secondary*	Primary*
1	PRIMARY LED	-	Green
2	DISK ACCESS LED	Amber or Green blinking (Green when accessing to HDD)	Amber or Green blinking (Green when accessing to HDD)

	LED	System
3	System FT LED	—

After the completion of disk duplication and when the PCI modules are duplicated:

	LED	Secondary*	Primary*
1	PRIMARY LED	-	Green
2	DISK ACCESS LED	Green	Green

	LED	System
3	System FT LED	Green

Evaluate Start and Stop of CPU Modules

This section describes how to confirm the continuous system operation after stopping one of the CPU modules.

1. Confirm that the CPU modules are duplicated.
To check if the CPU modules are duplicated, see the status LEDs of the CPU modules.
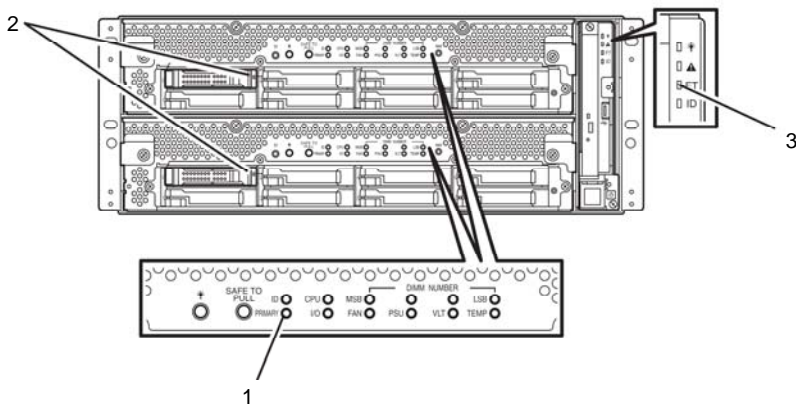
[Indications of status LEDs when CPU modules are duplicated]

	LED	Secondary (Operating)	Primary (Operating)
1	PRIMARY LED	Green	-
2	DISK ACCESS LED	Green	Green

	LED	System
3	System FT LED	Green

2. Use the ftsmaint command to stop the operation of the CPU module to be removed.
To stop the CPU Module 0, execute the following command.

```
# cd /opt/ft/bin
# ./ftsmaint bringdown 0    (*)
```

*As for the CPU module to be stopped, select [CPU Module(ID:0)] to stop CPU module 0,select [CPU Module(ID:1)] to stop CPU module 1.

When the CPU module is stopped, the status LEDs change as follows. This indicates that one CPU module is operating now.

[Indications of status when CPU module is stopped]

	LED	Secondary (Stopped) *	Primary (Operating)
1	PRIMARY LED	Green	-
2	DISK ACCESS LED	Green	Green

	LED	System
3	System FT LED	-

*Here, an example where CPU module 0 is stopped is shown.

3. Start the stopped CPU module.

Execute the following command to start the operation of the CPU module stopped in step 2.

cd /opt/ft/bin
./ftsmaint bringup 0

Once the CPU module is started, hardware diagnosis and then the duplication process are performed.
Note that the system is paused temporarily for copying memory during memory synchronization.

[Indications of status LEDs after completion of duplication]

	LED	Secondary (Operating)	Primary (Operating)
1	PRIMARY LED	Green	-
2	DISK ACCESS LED	Green	Green

	LED	**System**
3	System FT LED	Green

IMPORTANT:

After duplication is completed, the status of memory will be checked.

Wait until this process ends to perform the next step (evaluation of start and stop of PCI and CPU modules). When the process completes, the following event log will be output:
Kernel: EVLOG: INFORMATION – Memory consistency check has completed memory scan.

(This page is intentionally left blank.)

Chapter 4

System Configuration

This chapter describes Basic Input Output System (BIOS) configuration.

When you install the NEC Express5800/ft series for the first time or install/remove optional devices, thoroughly read this chapter for better understanding and correct setups.

SYSTEM BIOS –SETUP–

The SETUP utility is provided to make basic hardware configuration for the server. This utility is pre-installed in the flash memory of the server and ready to run.

IMPORTANT:

- The SETUP utility is intended for system Administrator use only.

- The SETUP utility allows you to set a password. The server is provided with two levels of password: Supervisor and User. With the Supervisor password, you can view and change all system parameters of the SETUP utility. With the User password, system parameters available for viewing and changing are limited.

- Do not set any password before installing the OS.

- The server contains the latest version of the SETUP utility. Dialog boxes appearing on your SETUP utility, thus, may differ from descriptions in this User's Guide. If you find anything unclear, see the online help or ask your sales agent.

Starting SETUP Utility

Powering on the server starts POST (Power On Self-Test) and displays its check results. If the NEC logo is displayed, press **Esc**.

After a few seconds, either of the following messages appears at bottom left on the screen depending on your system configuration.

> Press <F2> to enter SETUP

> Press <F2> to enter SETUP or Press <F12> to boot from Network

You may see either of the following messages at bottom left on the screen when POST terminates.

> Press <F1> to resume, <F2> to SETUP

Press **F2** to start the SETUP utility and display its Main menu.

If you have previously set a password with the SETUP utility, the password entry screen appears. Enter the password.

> Enter password:[   ]

Up to three password entries will be accepted. If you fail to enter the password correctly for three consecutive times, the server halts. (You can no longer proceed.) Power off the server.

TIPS:

The server is provided with two levels of password: Supervisor and User. With the Supervisor password, you can view and change all system configurations. With the User password, the system configurations you can view or change are limited.

Description of On-Screen Items and Key Usage

Use the following keyboard keys to work with the SETUP utility. (Key functions are also listed at the bottom of the screen.)

Shows the current menu.   Online help window

Options to be
configured

Denotes there are
submenus

Explanation of keys

Parameters
(selected parameters are highlighted)

```
                              ftServer Setup
       Main    Advanced    Security    Server    Boot    Exit

                                                    Item Specific Help
      ► Advanced Processor Configuration
      ► I/O Device Configuration
      ► Option ROM Configuration                    Advanced processor
      ► Advanced Chipset Control                    settings

        Boot-time Diagnostic Screen:    [Disabled]




       F1   Help  ↑↓  Select Item  -/+   Change Values      F    Setup Defaults
       Esc  Exit  ↔   Select Menu  Enter Select ► Sub-Menu  F1   Save and Exit
```

Cursor (↑, ↓):	Selects an item on the screen. The highlighted item is currently selected.
Cursor (←, →):	Selects the Main, Advanced, Security, System Hardware, Boot, or Exit menu.
–	Changes the value (parameter) of the selected item to the previous value.
+	Changes the value (parameter) of the selected item to next value.
Enter	Displays a submenu or chooses the selected parameter.
Esc	Displays the previous screen.
F1:	Press **F1** when you need help on SETUP operations. The help screen for SETUP operations appears. Press **Esc** to return to the previous screen.

F9:   Shows the following:

```
┌─────────────────────────────────────────┐
│          Setup Confirmation              │
│   Load default configuration now?        │
│          [Yes]        [No]               │
│                                          │
└─────────────────────────────────────────┘
```

If you select "Yes" and then press the **Enter** key, all items in the setup are set to default values. If you select "No" and then press either the **Enter** or **Esc** key, the status before pressing the **F9** key is restored.

F10:   Shows the following:

```
┌─────────────────────────────────────────┐
│          Setup Confirmation              │
│  Save Configuration changes and exit now?│
│             [Yes]      [No]              │
│                                          │
└─────────────────────────────────────────┘
```

If you select "Yes" and then press the **Enter** key, the setup will complete with all changes you have made saved. If you select "No" and then press either the **Enter** or **Esc** key, the status before pressing the **F10** key is restored.

Configuration Examples

The following describes examples of configuration required to use software-link features or for system operations.

UPS

To link power supply with the UPS

- To power on the server when power is supplied from the UPS

  Select [Server] - [AC-LINK] - [Power On].

- To keep the server off-powered even when power is supplied from the UPS if the POWER switch was used to power off

  Select [Server] - [AC-LINK] - [Last State].

- To keep the server off-powered even when power is supplied from the UPS

  Select [Server] - [AC-LINK] - [StayOff].

- To have enough time to initialize Fibre Channel disk and Fibre Channel switch and so on

  Adjust [Server] - [Power On Delay Time].

Keyboard

To set Num Lock

Select [Advanced] - [I/O Device Configuration] - [NumLock]

Security

To set passwords on the BIOS level

Select [Security] - [Set Supervisor Password] and enter a password.

Select [Security] - [Set User Password] and enter a password.

Set Supervisor password first, then User password.

Optional PCI–related devices

To enable Option ROM of the PCI card (option) installed on the server

Select [Advanced] - [Option ROM Configuration] - [PCI Slot n (….)] - [Enabled].

   n: Slot number to install the board

Boot

To change the boot order of devices connected to the server

Select [Boot] and specify the boot order.

To display POST check results

Select [Advanced] - [Boot-time Diagnostic Screen] - [Enabled].

You can also press **Esc** while the NEC log is on the screen to display POST check results.

To control from the HW console

- Remote operation via Serial

    Select [Server] - [Console Redirection], and make necessary settings.

Memory

To check the installed memory (DIMM) status:

Select [Advanced] - [System Memory] and [Extended Memory] and check the status indications.

Saving the Configuration Data

To save the BIOS configuration data

Select [Exit] - [Exit Saving Changes]

To discard changes to the BIOS configuration data

Select [Exit] - [Exit Discarding Changes]

To restore the default BIOS configuration data (the data may differ from the factory preset)

Select [Exit] - [Load Setup Defaults].

Menu and Parameter Descriptions

The SETUP utility has the following six major menus:

- Main
- Advanced
- Security
- Server
- Boot
- Exit

To configure detailed settings of functions, select a submenu from the above menus.
Below describes configurable functions and parameters and the factory settings displayed in the screen for each menu.

Main

Start the SETUP utility to display the Main menu.

When you select a menu with the "►" mark and press the **Enter** key, its submenu appears.

<Example>

```
                            ftServer Setup
   Main      Advanced     Security     Server     Boot     Exit

                                                   Item Specific Help

     System Time:      [13:18:41]
     System Date:      [06/22/2009]
                                               <Tab>, <Shift-Tab>, or
     CPU Speed         2930 MHz                 <Enter> selects field.
     Physical CPUs     1
     Logical CPUs      8

     System Memory     633 KB
     Extended Memory   2047 MB
     Cache Ram         1024 KB
     L3 Cache          8192 KB




   F1   Help  ↑↓  Select Item  -/+   Change Values    F9   Setup Defaults
   Esc  Exit  ↔   Select Menu  Enter  Select ▶ Sub-Menu  F10  Save and Exit
```

Available options in the Main and descriptions are listed below.

Option	Parameter	Description
System Time	HH:MM:SS	Specify the system time.
System Date	MM/DD/YYYY	Specify the system date.
CPU Speed	XXXX MHz	Displays the processor clock frequency.
Physical CPUs	X	Displays the number of processor installed.
System Memory	XXXX KB	Displays the size of system memory.
Extended Memory	XXXX MB	Displays the size of extended memory.
Cache Ram	XXXX KB	Displays the capacity of LS cache.
L3 Chache	XXXX KB	Displays the capacity of L3 cache.

IMPORTANT:

Check and adjust the system clock before operation in the following conditions.

- After transporting the equipment
- After storing the equipment
- After the equipment halt under the conditions which is out of the guranteed environment conditions (Temperature: 10 to 35°C, Humidity: 20 to 80%).

Check the system clock once in a month. It is recommended to operate the system clock using a time server (NTP server) if it is installed on the system which requires high level of time accuracy. If the system clock goes out of alignment remarkably as time goes by, though the system clock adjustment is performed, contact your sales agent.

Advanced

Move the cursor onto "Advanced" to display the Advanced menu.

There is no configurable item on the Advanced menu screen below. Display each sub menu and make settings on the sub menu screen. Select an option with the "▶" mark and press **Enter** to display its submenu.

```
                          ftServer Setup
   Main      Advanced     Security    Server     Boot      Exit

                                                 Item Specific Help

  ▶ Advanced Processor Configuration
  ▶ I/O Device Configuration
  ▶ Option ROM Configuration                     Advanced processor
  ▶ Advanced Chipset Control                     settings

    Boot-time Diagnostic Screen:      [Disabled]

   F1   Help  ↑↓  Select Item  -/+    Change Values    F9   Setup Defaults
   Esc  Exit  ↔   Select Menu  Enter  Select ▶ Sub-Menu  F10  Save and Exit
```

See the table below for setup options on the screen.

Option	Parameter	Description
Boot-time Diagnostic Screen	[Disabled] Enabled	Specify whether to display the Power On Self-Test (POST) screen at start-up. If "Disabled" is selected, the NEC logo appears while POST is in progress. (To display POST check results, press **Esc**.)

[   ]: factory default

Advanced Processor Configuration

When you select "Advanced Processor Configuration" in the Advanced menu, the following screen appears.

```
                        ftServer Setup
        ┌─────────────┐
        │  Advanced   │
╔═══════╧═════════════╧════════════════════════════╤═══════════════════════╗
║                                                   │                       ║
║   Advanced Processor Configuration                │  Item Specific Help   ║
║                                                   │                       ║
║                                                   │                       ║
║   Hyper-Threading Technology:    [Enabled]        │  Disables/enables     ║
║   Execute Disable Bit:           [Enabled]        │  Intel(R)             ║
║   Virtualization Technology:     [Enabled]        │  Hyper-Threading      ║
║   Hardware Prefetcher:           [Enabled]        │  Technology.          ║
║   Adjacent Cache Line Prefetch:  [Enabled]        │                       ║
║                                                   │                       ║
║                                                   │                       ║
║                                                   │                       ║
║                                                   │                       ║
║                                                   │                       ║
║                                                   │                       ║
║                                                   │                       ║
║                                                   │                       ║
╠═══════════════════════════════════════════════════════════════════════════╣
║  F1   Help  ↑↓  Select Item  -/+   Change Values   F9   Setup Defaults    ║
║  Esc  Exit  ↔   Select Menu  Enter Select ▶ Sub-Menu F10  Save and Exit    ║
╚═══════════════════════════════════════════════════════════════════════════╝
```

Refer to the table below for information on options.

Option	Parameter	Description
Hyper-Threading Technology	Disabled [Enabled]	Enables to function one physical processor as two logical processors. Configurable only when the processor that supports this function is mounted.
Execute Disable Bit	Disabled [Enabled]	Specify whether or not to enable Execute Disable Bit feature.
Virtualization Technology	Disabled [Enabled]	Specify whether or not to enable Intel Virtualization Technology feature.
Hardware Prefetcher	Disabled [Enabled]	Specify whether or not to enable Hardware Prefetcher.
Adjacent Cache Line Prefetch	Disabled [Enabled]	Specify whether or not to enable optimization of access to cache from memory.

[   ]: factory default

I/O Device Configuration

When you select "I/O Device Configuration" in the Advanced menu, the following screen appears. If you select a menu with the "►" mark and press **Enter**, its submenu appears.

```
                            ftServer Setup
          Advanced

          I/O Device Configuration                 Item Specific Help

    Serial Port 1:                  [Enabled]       Configure Serial Port 1
       Base I/O address:            [3F8/IRQ 4]     using options:
       Serial Port 1 Connection:    [Serial Connector]
    Serial Port 2:                  [Enabled]       [Disabled]
       Base I/O address:            [2F8/IRQ 3]       No configuration
                                                    [Enabled]
    Keyboard Features:                                 User configuration
                                                    [Auto]
    NumLock:                        [Off]             BIOS or OS chooses
                                                      configuration




 F1   Help   ↑↓  Select Item   -/+    Change Values    F9   Setup Defaults
 Esc  Exit   ↔   Select Menu   Enter  Select ▶ Sub-Menu F10  Save and Exit
```

Refer to the table below for information on options.

Option	Parameter	Description
Serial Port 1	Enabled [Disabled] Auto	Specify whether or not to enable Serial Port 1.
Base I/O address	[3F8/IRQ4] 2F8/IRQ3 3E8/IRQ4 2E8/IRQ3	Specify the I/O address and IRQ of Serial Port 1.
Serial Port 1 Connection	[Serial Connector] Internal Modem	Specify Serial Connector or Internal Modem for Serial Port 1 connection.
Serial Port 2	Enabled [Disabled] Auto	Specify whether or not to enable Serial Port 2.

Base I/O address	3F8/IRQ4 [2F8/IRQ3] 3E8/IRQ4 2E8/IRQ3	Specify the I/O address and IRQ of Serial Port 2.
Keyboard Features		Display only.
NumLock	AUTO On [Off]	Specify whether or not to enable NumLock at system startup.

[   ]: factory default

Option ROM Configuration

When you select "Option ROM Configuration" in the Advanced menu, the following screen appears.

```
                        ftServer Setup
       ┌──────────────┐
       │  Advanced    │
       └──────────────┘
  ┌─────────────────────────────────────────┬──────────────────────────┐
  │      Option ROM Configuration           │    Item Specific Help    │
  │                                         │                          │
  │                                         │                          │
  │   Embedded SAS Option ROM:   [Enabled]  │   Enables Embedded SAS   │
  │   Embedded PXE#1 Option ROM: [Enabled]  │   Option ROM to boot     │
  │   Embedded PXE#2 Option ROM: [Enabled]  │   from the device.       │
  │                                         │   Default state: ENABLED │
  │                                         │                          │
  │                                         │                          │
  │                                         │                          │
  │                                         │                          │
  │                                         │                          │
  │                                         │                          │
  │                                         │                          │
  │                                         │                          │
  │                                         │                          │
  │                                         │                          │
  └─────────────────────────────────────────┴──────────────────────────┘
   F1   Help  ↑↓  Select Item  -/+    Change Values   F9   Setup Defaults
   Esc  Exit  ↔   Select Menu   Enter  Select ▶ Sub-Menu  F10  Save and Exit
```
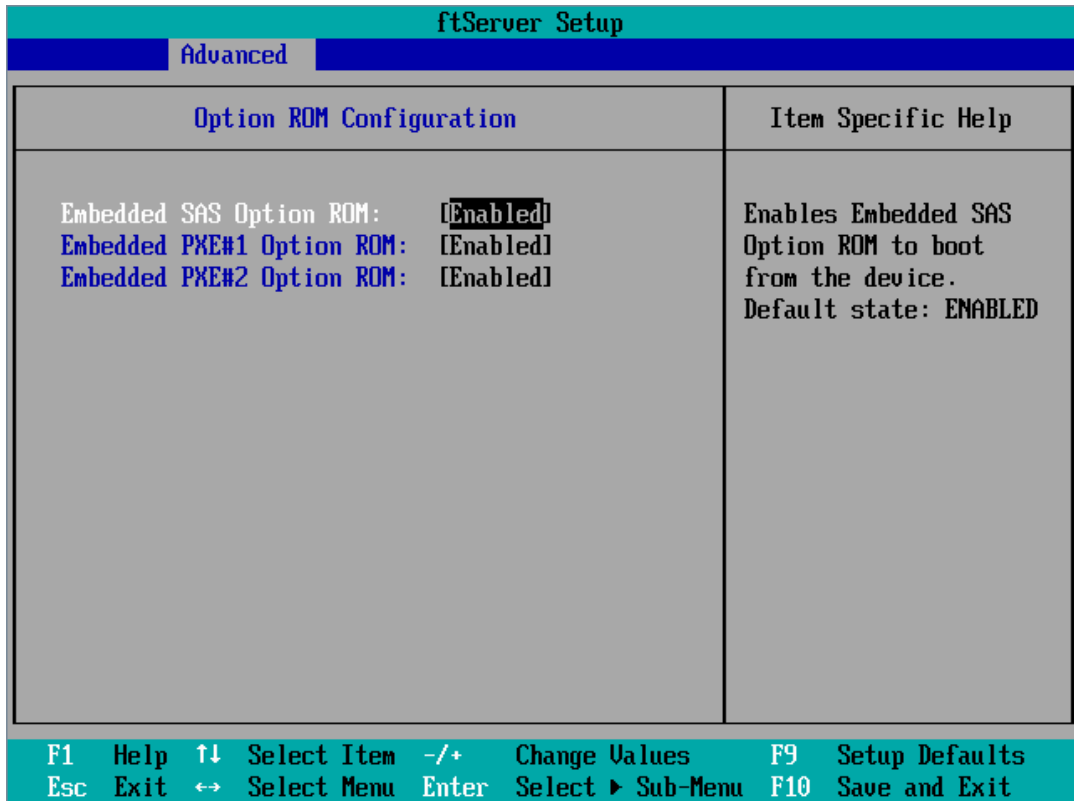
Refer to the table below for information on options.

Option	Parameter	Description
PCI Slot 1 Option ROM	Enabled [Disabled]	If "Enabled" is selected, the extended ROM of the PCI card installed on PCI Slot 1 is initialized. Note: this option is displayed only when a PCI card is installed.
PCI Slot 2 Option ROM	Enabled [Disabled]	If "Enabled" is selected, the extended ROM of the PCI card installed on PCI Slot 2 is initialized. Note: this option is displayed only when a PCI card is installed.
PCI Slot 3 Option ROM	Enabled [Disabled]	If "Enabled" is selected, the extended ROM of the PCI card installed on PCI Slot 3 is initialized. Note: this option is displayed only when a PCI card is installed.
PCI Slot 4 Option ROM	Enabled [Disabled]	If "Enabled" is selected, the extended ROM of the PCI card installed on PCI Slot 4 is initialized. Note: this option is displayed only when a PCI card is installed.
Embedded SAS Option ROM	[Enabled] Disabled	If "Enabled" is selected, SAS extended ROM embedded in the motherboard is initialized.

Embedded PXE#1 Option ROM	[Enabled] Disabled	If "Enabled" is selected, the extended ROM of LAN #1 embedded in the motherboard is initialized.
Embedded PXE#2 Option ROM	[Enabled] Disabled	If "Enabled" is selected, the extended ROM of LAN #2 embedded in the motherboard is initialized.

[   ]: factory default

Advanced Chipset Control

When you select "Advanced Chipset Control" in the Advanced menu, the following screen appears.

```
                         ftServer Setup
          Advanced

          Advanced Chipset Control              Item Specific Help


   Multimedia Timer:    [Disabled]          Enables/disables
                                            Multimedia Timer(HPET).
   Intel(R) I/OAT:      [Disabled]
   Intel(R) VT-d:       [Disabled]

   Wake On LAN:         [Enabled]














   F1   Help   ↑↓ Select Item   -/+   Change Values    F9   Setup Defaults
   Esc  Exit   ↔  Select Menu   Enter Select ▶ Sub-Menu F10  Save and Exit
```

Refer to the table below for information on options.

Option	Parameter	Description
Multimedia Timer	[Disabled] Enabled	Specify whether or not to enable timer to correspond to multimedia.
Intel(R) I/IOAT	[Disabled] Enabled	Specify whether or not to enable Intel(R) I/IOAcceleration Technology feature.
Intel(R) VT-d	[Disabled] Enabled	Specify whether or not to enable "Intel(R) Virtualization Technology for Directed I/O" that Intel Chipset offers.
Wake On LAN	[Enabled] Disabled	Specify whether or not to enable network remote power-on feature.

[   ]: factory default

IMPORTANT:

Wake On LAN environment is unavailable on ESX4.0.

Security

Move the cursor onto "Security" to display the Security menu.

```
                            ftServer Setup
   Main      Advanced     Security     Server     Boot     Exit

                                              Item Specific Help

     Supervisor Password Is:        Unset
     User Password Is:              Unset
                                              Supervisor Password
     Set Supervisor Password       [Enter]    controls access to the
     Set User Password             [Enter]    setup utility.

     Password on boot:             [Disabled]

   ▶ Security Chip Configuration




   F1   Help  ↑↓  Select Item  -/+   Change Values    F9   Setup Defaults
   Esc  Exit  ↔   Select Menu  Enter Select ▶ Sub-Menu  F10  Save and Exit
```

Select "Set Supervisor Password" or "Set User Password" and press **Enter** to display the following pop-up screen. The screen below shows when "Set Supervisor Password" is selected.

Set a password on this pop-up screen. Enter a password of up to seven alphanumeric characters and symbols from the keyboard.

```
                          ftServer Setup
    Main     Advanced    Security    Server    Boot    Exit

                                              Item Specific Help

    Supervisor Password Is:      Unset
    User Password Is:            Unset
                                            Supervisor Password
    Set Supervisor Password     [Enter]     controls access to the
    Set User Password           [Enter]     setup utility.

    Password on boot      Set Supervisor Password

  ▶ Security Chip Co    Enter New Password     [_        ]
                        Confirm New Password   [         ]



                         Enter  Accepts
                         Esc    Clears
```

IMPORTANT:

■ User password setup is not available before Supervisor password setup.

■ Do not set any password before installing the OS.

■ If you forget your password, contact your sales agent.

See the table below for setup options on the screen.

Option	Parameter	Description
Supervisor Password Is	[Unset] Set	Indicates Supervisor password setup status (view only).
User Password is	[Unset] Set	Indicates User password setup status (view only).
Set Supervisor Password	[Enter]	Press **Enter** to display the supervisor password entry screen. This option is available only when you log into the SETUP utility with the supervisor password.
Set User Password	[Enter]	Press **Enter** to display the user password entry screen. With a user password, accessing the SETUP menus is restricted.
Password on boot	[Disabled] Enabled	Specify whether to request a password entry at boot-up. User password setup is required beforehand.

[   ]: factory default

IMPORTANT:

If you have logged in SETUP by using the Supervisor Password, you can check and change all settings. If you have logged in SETUP by using User Password, you can see the settings but cannot make changes on the settings except System Time, System Date and User Password of Main.

Server

Move the cursor onto [Server] to display the Server menu.

The following describes options you can configure in the Server menu and their functions.
Select an option with the "►" mark and press **Enter** to display its submenu.

Refer to the table below for information on options.

```
                        ftServer Setup
   Main     Advanced    Security    Server    Boot    Exit

                                              Item Specific Help
 ► System Management
 ► Console Redirection
 ► CRU0 BMC LAN Configuration              Additional setup
 ► CRU1 BMC LAN Configuration              menu to view
 ► Event Log Configuration                 server management
 ► Monitoring Configuration                features.

   Post Error Pause:        [Enabled]

   AC-LINK:                 [Last State]
   Power ON Delay Time:     [  5]


 F1   Help  ↑↓  Select Item  -/+    Change Values   F9   Setup Defaults
 Esc  Exit  ↔   Select Menu  Enter  Select ► Sub-Menu  F10  Save and Exit
```

Option	Parameter	Description
Post Error Pause	Disabled [Enabled]	Set whether or not to pause POST at the end of POST if an error has occurred during POST execution.
AC LINK	Stay Off [Last State] Power On	Specify the AC LINK feature by selecting the status of the power supply unit of the server when the AC power supply restarts. (See the following table for details.) When "Power On" and "Last State" are set, the system can be started after waiting for both CPU/IO modules to be mounted up to 180 seconds in addition to the delay time of "Power On Delay Time".
Power ON Delay Time	[180]-255(s)	Set the DC ON delay time if AC LINK is set to "Power On" or "Last State" (unit: second).

[   ]: factory default

The table below lists how selections for "AC LINK" determine the power status of the server when the power supply to the server restarts.

State before powered off	Parameter		
	Stay Off	Last State	Power On
In service	Off	On	On
Out of service (DC power: Off)	Off	Off	On
Forced shutdown *	Off	Off	On

* Pressing the POWER switch for over four seconds shuts down the power to the server.

System Management

Select "System Management" on the Server menu and press **Enter** to display the following screen.

〈Example〉

```
┌─────────────────────────────────────────────────────────────────────┐
│                         ftServer Setup                              │
│                            Server                                    │
├──────────────────────────────────────────┬──────────────────────────┤
│           System Management              │    Item Specific Help    │
│                                          │                          │
│                                          │                          │
│   BIOS Version:        4.0:31            │  All items on this menu  │
│                                          │  cannot be modified in   │
│   Board Part #:        243-633638        │  user mode.  If any      │
│   Board Serial #:      0000000101        │  items require changes,  │
│   System Part #:       N8800-144         │  please consult your     │
│   System Serial #:     0000000101        │  system Supervisor.      │
│   Chassis Part #:      243-000000-001    │                          │
│   Chassis Serial #:    01                │                          │
│   BMC Device ID:       40                │                          │
│   BMC Device Rev:      01                │                          │
│   BMC Firmware Rev:    01.11             │                          │
│   SDR Rev:             SDR Version 01.02 │                          │
│   PIA Rev:             01.05             │                          │
│   ASIC Rev:            0002700239        │                          │
│   SMM Rev:             21              ▼ │                          │
│                                          │                          │
├──────────────────────────────────────────┴──────────────────────────┤
│  F1   Help  ↑↓  Select Item  -/+  Change Values    F9   Setup Defaults│
│  Esc  Exit  ↔   Select Menu  Enter Select ▶ Sub-Menu F10  Save and Exit│
└─────────────────────────────────────────────────────────────────────┘
```

See the table below for setup options on the screen.

Option	Parameter	Description
BIOS Version	—	Displays the BIOS version.
Board Part Number	—	Displays the board information.
Board Serial Number	—	Displays the board information.
System Part Number	—	Displays the system information.
System Serial Number	—	Displays the system information.
Chassis Part Number	—	Displays the chassis information.
Chassis Serial Number	—	Displays the chassis information.
BMC Device ID	—	Displays the BMC information.
BMC Device Revision	—	Displays the BMC information.
BMC Firmware Revision	—	Displays the BMC information.
SDR Revision	—	Displays the revision of SDR (sensor device information).
PIA Revision	—	Displays the PIA (plat form information) revision.
ASIC Rev	—	Displays the firmware information of the fault-tolerant chipset.
SMM Rev	—	Displays the firmware information of System Management.
System MAC Address	—	Displays MAC Address of the system.

[   ]: factory default

Console Redirection

Select "Console Redirection" on the Server menu and press **Enter** to display the following screen.

```
                           ftServer Setup
                              Server
┌─────────────────────────────────────────┬─────────────────────────┐
│        Console Redirection               │   Item Specific Help    │
│                                          │                         │
│                                          │                         │
│   Com Port Address:        [Disabled]    │  If enabled, it will    │
│                                          │  use a port on the      │
│   Baud Rate:               [19.2K]       │  motherboard.           │
│   Console Type:            [PC ANSI]     │                         │
│   Flow Control:            [CTS/RTS]     │                         │
│   Console connection:      [Direct]      │                         │
│   Continue C.R. after POST: [Off]        │                         │
│                                          │                         │
│                                          │                         │
│                                          │                         │
│                                          │                         │
│                                          │                         │
│                                          │                         │
├──────────────────────────────────────────────────────────────────┤
│  F1   Help  ↑↓  Select Item  -/+   Change Values   F9   Setup Defaults │
│  Esc  Exit  ↔   Select Menu  Enter Select ▶ Sub-Menu F10 Save and Exit │
└──────────────────────────────────────────────────────────────────┘
```

See the table below for setup options on the screen.

Option	Parameter	Description
Com Port Address	[Disabled] Serial Port1 Serial Port2	Select a serial port.
Baud Rate*	9600 [19.2K] 38.4K 57.6K 115.2K	Select a port rate used for the interface with a hardware console to be connected.
Console Type*	VT100 VT100, 8bit PC-ANSI, 7bit [PC-ANSI] VT100+ VT-UTF8	Select a console type.
Flow Control*	None XON/XOFF [CTS/RTS]	Select a flow control method.
Console Connection	[Direct] Via modem	Select a connector.
Continue C.R. after POST	[Off] On	Specify whether or not to continue Console Redirection after OS is loaded.

[   ]: factory default

CRUx BMC LAN Configuration Submenu

Select "CRUx BMC LAN Configuration" on the Server menu and press **Enter** to display the following screen.

```
                        ftServer Setup
                              Server
╭───────────────────────────────────────────┬──────────────────────╮
│      CRU0 BMC LAN Configuration             │   Item Specific Help │
│                                             │                      │
│  LAN Connection Type:    [Auto Negotiation] │  Set a LAN connection│
│  IP Address:             [192.168.001.001]  │  type on your        │
│  Subnet Mask:            [255.255.255.000]  │  management LAN.      │
│  Default Gateway:        [000.000.000.000]  │                      │
│  DHCP:                   [Disabled]         │                      │
│                                             │                      │
│  Web Interface                              │                      │
│  HTTP:                   [Disabled]         │                      │
│  HTTP Port Number:       [   80]            │                      │
│  HTTPS:                  [Disabled]         │                      │
│  HTTPS Port Number:      [  443]            │                      │
│                                             │                      │
│  Command Line Interface                     │                      │
│  Telnet:                 [Disabled]         │                      │
│  Telnet Port Number:     [   23]          ▼ │                      │
╰───────────────────────────────────────────┴──────────────────────╯
 F1   Help   ↑↓  Select Item  -/+   Change Values    F9   Setup Defaults
 Esc  Exit   ↔   Select Menu   Enter Select ▶ Sub-Menu F10  Save and Exit
```

See the table below for setup options on the screen.

Option	Parameter	Description
LAN Connection Type	[Auto Negotiation] 100Mbps Full Duplex 100Mbps Half Duplex 10Mbps Full Duplex 10Mbps Half Duplex	Set the connection type of the Management LAN.
IP Address	[192.168.001.001]	Set the IP address for the Management LAN.
Subnet Mask	[255.255.255.000]	Set the subnet mask for the Management LAN.
Default Gateway	[000.000.000.000]	Set the gateway for the Management LAN.
DHCP	[Disabled] Enabled	Set "Enabled" to automatically acquire an IP address from the DHCP server. Set "Disabled" when you specify the IP address.
Web Interface	—	—
HTTP	[Disabled] Enabled	Set "Enabled" if you use communication via HTTP, a web interface.
HTTP Port Number	[80]	Set the TCP port number for the Management LAN to communicate via HTTP.
HTTPS	[Disabled] Enabled	Set "Enabled" if you use communication via HTTPS, a web interface.
HTTPS Port	[443]	Set the TPC port number for the Management

Option	Parameter	Description
Number		LAN to communicate via HTTPS.
Command Port Number	—	—
Telnet	[Disabled] Enabled	Set "Enabled" when you use Telnet-connected communication as the command line interface communication.
Telnet Port Number	[23]	Set the TCP port number when you use Telnet-connected communication.
SSH	[Disabled] Enabled	Set the TCP port number when you use SSH-connected communication as the command line interface.
SSH Port Number	[22]	Set the TCP port number when you use SSH-connected communication.
Clear BMC Configuration	[Enter]	Click [Enter] and then select [Yes] to initialize BMC Configuration.

[   ]: factory default

Event Log Configuration

Select "Event log Configuration" on the Server menu and press **Enter** to display the following screen.

```
                           ftServer Setup
                               Server

         Event Log Configuration                 Item Specific Help

     Clear Online Event Logs:    [Press Enter]    The system event log
                                                  will be cleared if
     Clear Offline Event Logs:   [Press Enter]    selecting "YES".




     F1   Help   ↑↓  Select Item   -/+   Change Values    F9   Setup Defaults
     Esc  Exit   ↔   Select Menu   Enter  Execute Command  F10  Save and Exit
```

See the table below for setup options on the screen.

Option	Parameter	Description
Clear Online Event Logs	[Press Enter]	To clear event logs of the working module, press the **Enter** key and select "Yes."
Clear Offline Event Logs	[Press Enter]	To clear event logs of the stand-by module, press the **Enter** key and select "Yes."

Monitoring Configuration

Select "Monitoring Configuration" on the Server menu and press **Enter** to display the following screen.

```
                        ftServer Setup
                           Server
┌────────────────────────────────────────┬──────────────────────┐
│      Monitoring Configuration           │  Item Specific Help  │
│                                         │                      │
│  FRB-2 Timer:                [Enabled]  │  Disables/enables the│
│                                         │  FRB-2 Timer.        │
│  PCI Enumeration Monitoring:      [Enabled] │                  │
│  PCI Enumeration Monitoring Timeout:  [ 180] │                 │
│                                         │                      │
│  Option ROM Scan Monitoring:      [Enabled] │                  │
│  Option ROM Scan Monitoring Timeout:  [ 300] │                 │
│                                         │                      │
│  OS Boot Monitoring:              [Enabled] │                  │
│  OS Boot Monitoring Timeout:          [ 600] │                 │
│                                         │                      │
│  POST Pause Monitoring:           [Enabled] │                  │
│  POST Pause Monitoring Time-out:      [ 180] │                 │
│                                         │                      │
│                                         │                      │
├─────────────────────────────────────────────┴─────────────────┤
│  F1   Help  ↑↓  Select Item   -/+    Change Values   F9   Setup Defaults │
│  Esc  Exit  ↔   Select Menu  Enter  Select ▶ Sub-Menu  F10  Save and Exit │
└────────────────────────────────────────────────────────────────┘
```

See the table below for setup options on the screen.

Option	Parameter	Description
FRB-2 timer	Disabled [Enabled]	Select whether or not to enable the FRB-2 timer.
PCI Enumeration Monitoring	Disabled [Enabled]	Select whether or not to enable the function to monitor PCI Device scan.
PCI Enumeration Monitoring Timeout	60-[180]-1200	Set the timeout for PCI Device scan. (unit: second)
Option ROM Scan Monitoring	Disabled [Enabled]	Select whether or not to enable the function to monitor the extended ROM scan.
Option ROM Monitoring Timeout	60-[300]-1200	Set the timeout of the extended ROM scan. (unit: second)
OS Boot Monitoring	Disabled [Enabled]	Select whether or not to enable the function to monitor OS boot-up. If you are starting up from an OS with no NEC ESMPRO Agent installed, disable this option.
OS Boot Monitoring Timeout	60-[600]-1200	Set the timeout at OS boot-up. (unit: second)
POST Pause Monitoring	Disabled [Enabled]	Set whether or not to enable the POST monitoring function during boot pause. (unit: second)
POST Pause Monitoring Time-out	60-[180]-1200	Set the time for POST monitoring during boot pause. (unit: second)

[   ]: factory default

Boot

Move the cursor onto "Boot" to display the Boot menu.

The server searches for the boot device according to the order specified in this menu and use the software to boot the system if found.

```
                            ftServer Setup
     Main      Advanced     Security     Server    Boot    Exit

                                                  ┌─────────────────────┐
                                                  │  Item Specific Help │
      1:   USB CDROM: MATSHITA UJDA782 DVD/CDRW    ├─────────────────────┤
      2:   USB FDC:                                │                     │
      3:   USB KEY:                                │ Keys used to view or│
      4:   USB HDD:                                │ configure devices:  │
      5:   PCI SCSI: #0500 ID00 LUN0 SEAGATE  S    │ Up and Down arrows  │
      6:   PCI BEV: IBA GE Slot 0B00 v1322         │ select a device.    │
      7:   PCI BEV: IBA GE Slot 0B01 v1322         │ <+> and <-> moves   │
      8:                                           │ the device up or down.│
                                                  │ <x> exclude or include│
                                                  │ the device to boot. │
                                                  │                     │
                                                  │                     │
                                                  │                     │

     F1   Help  ↑↓  Select Item  -/+   Change Values    F9   Setup Defaults
     Esc  Exit  ↔   Select Menu  Enter Select ▶ Sub-Menu F10  Save and Exit
```
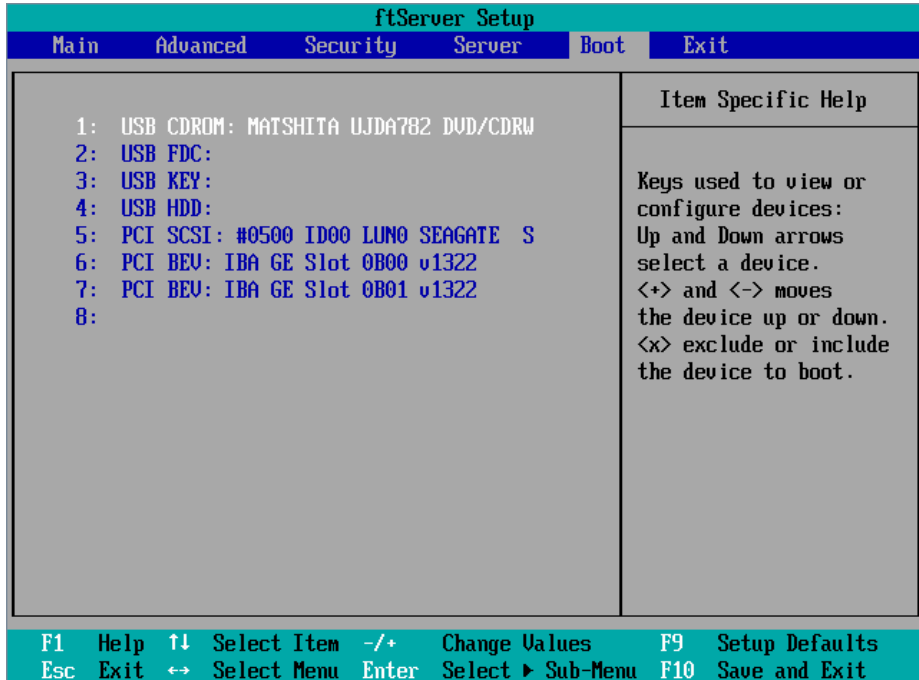
See the table below for options on the screen.

Displayed Item	Device
USB CDROM	USB CD-ROM Drive
USB FDC	USB Floppy Disk Drive
USB KEY	USB device such as USB Flash Memory
USB HDD	USB Hard Disk Drive
PCI SCSI	Standard-equipped Hard Disk Drive
PCI BEV	BA GE Slot xxxx : standard-equipped LAN

[   ]: factory default

1. BIOS displays the pertinent device information when it detects a bootable device.
   You need to register the devices in order to boot from the arbitrary devices displayed on the menu (up to 8 devices are registrable).

2. You can register/deregister the selected devices as the boot device after you select the device and press **X** key. If you have already registered up to 8 bootable devices, you can no more register even when you press **X** key. Deregister any device that you do not need from the menu and retry the registration.

3. You can change the boot device order using ↑ or ↓ and + or –. Move the cursor to select the device by ↑ or ↓, and then change the priority using + or –.

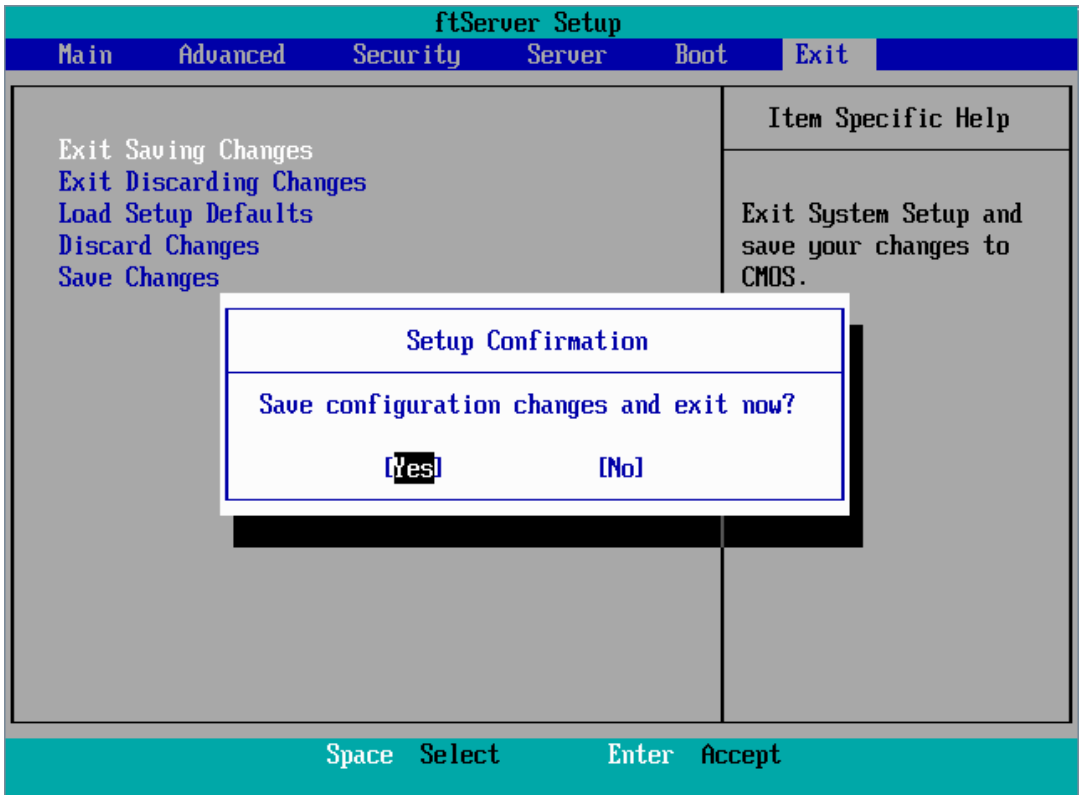## Exit

Move the cursor onto "Exit" to display the Exit menu.

```
                          ftServer Setup
     Main     Advanced    Security    Server    Boot    Exit

   ┌────────────────────────────────────────┬──────────────────────┐
   │                                        │  Item Specific Help  │
   │                                        ├──────────────────────┤
   │   Exit Saving Changes                  │                      │
   │   Exit Discarding Changes              │  Exit System Setup and│
   │   Load Setup Defaults                  │  save your changes to │
   │   Discard Changes                      │  CMOS.               │
   │   Save Changes                         │                      │
   │                                        │                      │
   │                                        │                      │
   │                                        │                      │
   │                                        │                      │
   │                                        │                      │
   │                                        │                      │
   │                                        │                      │
   │                                        │                      │
   │                                        │                      │
   │                                        │                      │
   └────────────────────────────────────────┴──────────────────────┘
    F1   Help   ↑↓  Select Item   -/+   Change Values    F9   Setup Defaults
    Esc  Exit   ↔   Select Menu   Enter Execute Command   F10  Save and Exit
```

The following describes each option on the Exit menu:

Exit Saving Changes

Select this option to save the current configuration data into the CMOS (non-volatile memory) and exit the SETUP utility.

Select "Exit Saving Changes" to display the screen below. Select "Yes" to save the current configuration data into the CMOS (non-volatile memory) and exit the SETUP utility. The server will automatically restart the system.
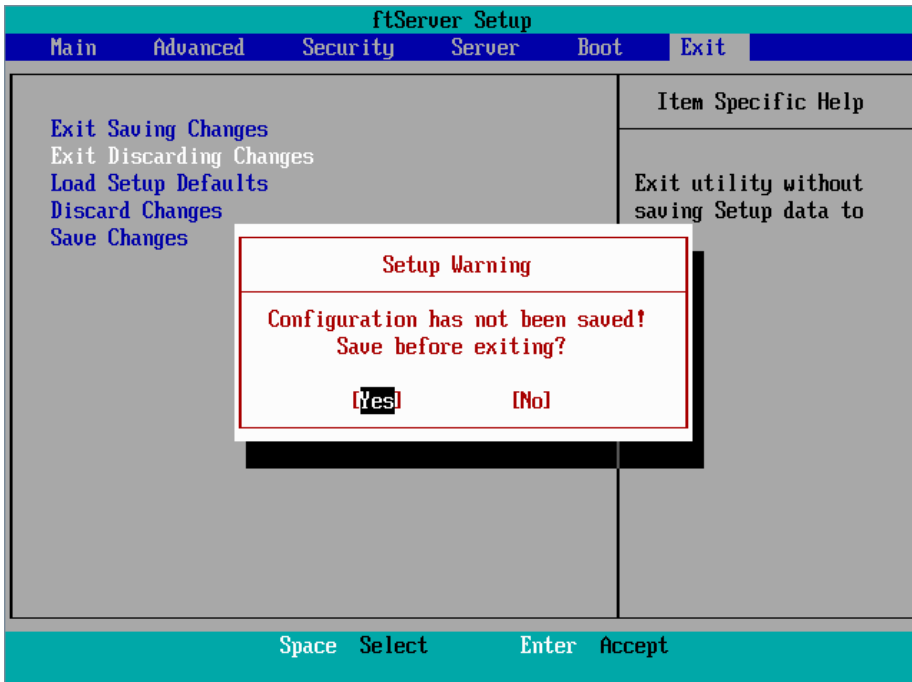
```
                              ftServer Setup
     Main      Advanced     Security     Server     Boot     Exit

                                                    Item Specific Help

     Exit Saving Changes
     Exit Discarding Changes
     Load Setup Defaults                            Exit System Setup and
     Discard Changes                                save your changes to
     Save Changes                                   CMOS.

              ┌──────────────────────────────────────────┐
              │            Setup Confirmation             │
              │                                           │
              │   Save configuration changes and exit now?│
              │                                           │
              │        [Yes]            [No]              │
              └──────────────────────────────────────────┘



                   Space   Select        Enter   Accept
```

Exit Discarding Changes

Select this option to exit the SETUP utility without saving the current configuration data into the CMOS (non-volatile memory).
If you select "Yes" here, the "SETUP Warning" dialogue box appears.
If you select "No" in the "SETUP Warning" dialogue box, you can exit
SETUP without saving the changes you have made.
If you select "Yes" in the dialogue box, you can exit SETUP with the changes you have made saved in CMOS. The server reboots automatically.

```
                              ftServer Setup
   Main      Advanced     Security     Server     Boot     Exit

                                                  Item Specific Help
     Exit Saving Changes
     Exit Discarding Changes
     Load Setup Defaults                          Exit utility without
     Discard Changes                              saving Setup data to
     Save Changes
                  ┌──────────────────────────────────────┐
                  │            Setup Warning             │
                  │                                       │
                  │   Configuration has not been saved!   │
                  │        Save before exiting?           │
                  │                                       │
                  │      [Yes]           [No]             │
                  └──────────────────────────────────────┘




              Space   Select          Enter   Accept
```

Load Setup Defaults

Select this option if you want to reset all values in SETUP to default (factory-set values). When you select Load Setup Defaults, the dialogue box as shown below appears.
If you select "Yes" in the dialogue box, default values are restored. If you select "No", you will see the Exit menu screen.

```
                            ftServer Setup
     Main      Advanced     Security      Server     Boot     Exit

                                                Item Specific Help

        Exit Saving Changes
        Exit Discarding Changes
        Load Setup Defaults                  Load default values
        Discard Changes                      for all SETUP items.
        Save Changes

                    Setup Confirmation

               Load default configuration now?

                    [Yes]         [No]



                  Space   Select        Enter   Accept
```
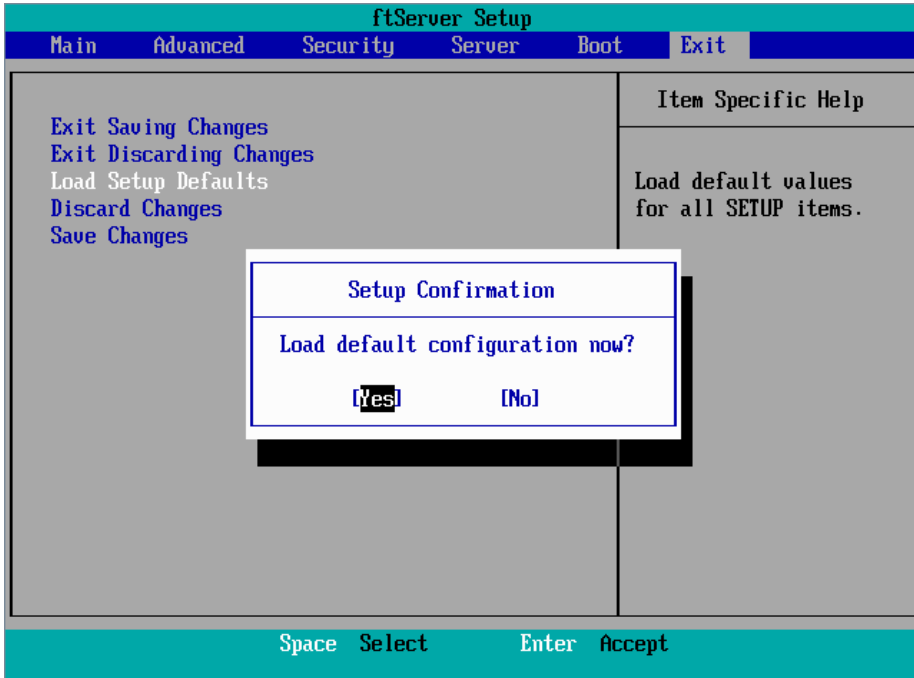
Discard Changes

Select this option if you want to restore previous values before saving values in CMOS. When you select "Discard Changes", you will see the dialogue box as shown below.
If you select "Yes" in the dialogue box, changes you have made are discarded and previous settings are restored.
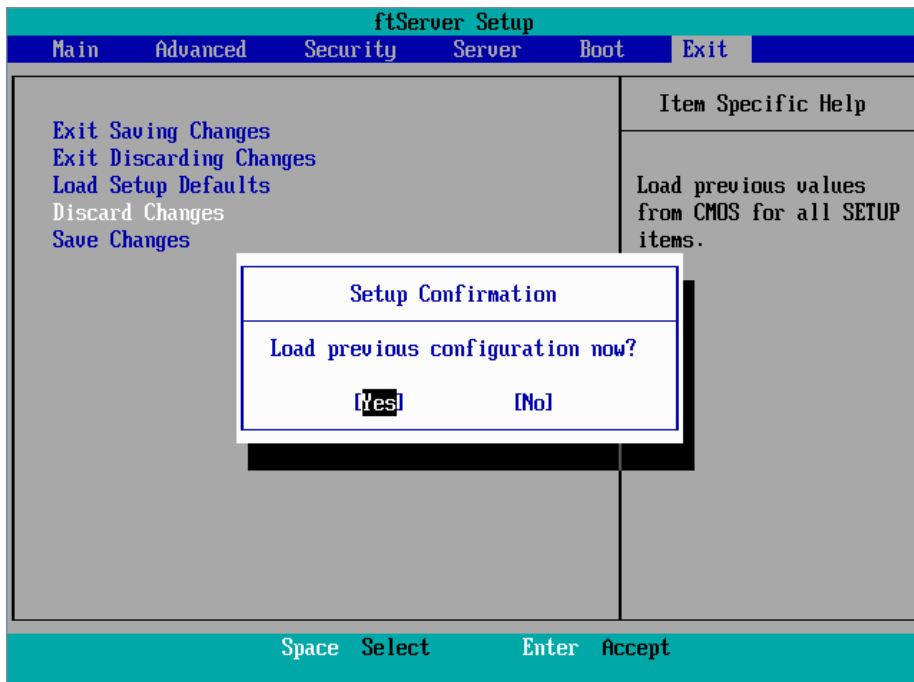
IMPORTANT:

The default value and the factory default value differ partially. If you want to bring the value back to the default, verify all the value you want to make changes.

Save Changes

Select this option if you want to save changes you have made in CMOS (non-volatile memory) without exiting SETUP. When you select the Save Changes, you will see the dialogue box as shown below.
If you select "Yes" in the dialogue box, changes you have made are saved in CMOS (non-volatile memory).

```
                          ftServer Setup
    Main     Advanced     Security     Server     Boot     Exit

                                              Item Specific Help

    Exit Saving Changes
    Exit Discarding Changes
    Load Setup Defaults                 Save Setup Data to
    Discard Changes                     CMOS.
    Save Changes

                  ┌──────────────────────────────────┐
                  │        Setup Confirmation         │
                  │                                    │
                  │    Save configuration changes now? │
                  │                                    │
                  │        [Yes]          [No]         │
                  └──────────────────────────────────┘

              Space   Select          Enter   Accept
```
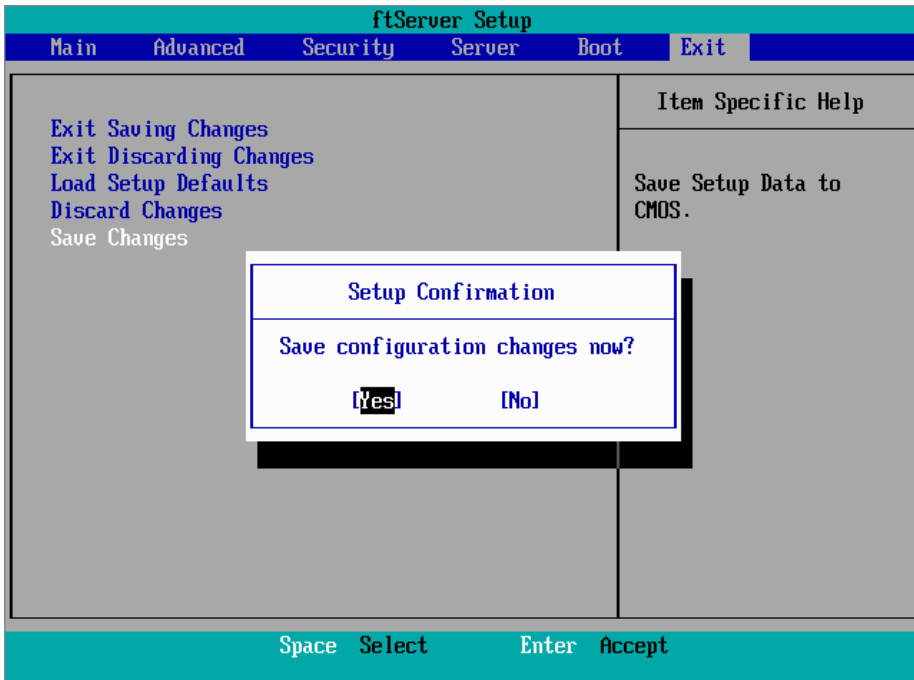
SAS BIOS – SAS CONFIGURATION UTILITY –

SAS Configuration utility makes settings of the built-in SAS controller. You can start it up by simple key operation during POST execution without using any special startup disk.

IMPORTANT:

- Because the server is installed with the latest version of the utility, your screen display may be different from the one described in this guide. For information on options different from those described in this guide, refer to the online help or ask your service agent.

- When you start this utility, select [Server], [Monitoring Configuration], [Option ROM Scan Monitoring], and [Disabled]. If [Enabled] is selected, system may reboot while you are making settings. However, set [Option ROM Scan Monitoring] to [Enabled] after making settings.

- This utility is set for the CPU/IO module of the primary side. When you configure the CPU/IO module of the secondary side, first power off the server, plug out and plug in the AC code of the primary side. Then start the server.

- Do not change the settings on each utility menu, as doing so causes failure and malfunction of this server.

Starting the SAS Configuration utility

The following section describes the procedures to start the SAS/ Configuration utility.

1. Power on the server.

The following message appears on the screen during POST execution.

```
LSI Corporation MPT SAS BIOS
MPTBIOS-6.28.00.00 (2009.02.03)
Copyright 2000-2009 LSI Corporation.


Press Ctrl-C to start LSI Corp Configuration Utility...
```

2. Press and hold down the **Ctrl** key and press the **C** key.

The SAS Configuration utility starts up with the "Adapter List" menu displayed.

```
LSI Corp Config Utility    v6.28.00.00 (2009.02.03)
Adapter List  Global Properties
Adapter           PCI  PCI  PCI  PCI   FW Revision    Status    Boot
                  Bus  Dev  Fnc  Slot                           Order
C1068E_           05   00   00   00    1.28.00.00-IT  Enabled   0




Esc = Exit Menu      F1/Shift+1 = Help
Alt+N = Global Properties -/+ = Alter Boot Order   Ins/Del = Alter Boot List
```

Quitting the SAS Configuration utility

The following section describes the procedures to quit the SAS/ Configuration utility.

1. Keep pressing **ESC** key until the "Adapter List" menu appears.
If you changed each menu setting of "SAS Configuration Utility," a message appears to prompt whether you want to save the changes made.
Select the item you want and press **Enter** key when the message is displayed.

```
xxxxxxxx xxxxxxxx changes have been made
  Cancel Exit
  Save changes then exit this menu
  Discard changes then exit this menu
  Exit the Configuration Utility and Reboot
```

2. If you press **ESC** key on the "Adapter List" menu, a massage prompts you whether or not to save the changes. Select the item you want and press **Enter** key when the message is displayed.

```
Are you sure you want to exit?
  Cancel Exit
  Save changes and reboot.
  Discard changes and reboot.
  Exit the Configuration Utility and Reboot
```

The changes made on SAS Configuration Utility will be effective after the reboot of the server.

Physical Formatting of the Hard Disk Drive

The following describes how to execute physical formatting of hard disk drive.

1. Press **Enter** key on the "Adapter List" menu.
"Adapter Properties" menu appears after a short while.

```
LSI Corp Config Utility      v6.28.00.00 (2009.02.03)
Adapter Properties -- SAS1068E

          Adapter                        C1068E
          PCI Slot                       00
          PCI Address(Bus/Dev)           05:00
          MPT Firmware Revision          1.28.00.00-IT
          SAS Address                    50030130:F1414300
          NVDATA Version                 2D.05
          Status                         Enabled
          Boot Order                     0
          Boot Support                   [Enabled BIOS & OS]_

          SAS Topology

          Advanced Adapter Properties




 Esc = Exit Menu       F1/Shift+1 = Help
 Enter = Select Item   -/+/Enter = Change Item
```

2. Select "SAS Topology" and press **Enter** key.
"SAS Topology" menu appears after a while.

```
LSI Corp Config Utility      v6.28.00.00 (2009.02.03)
SAS Topology -- SAS1068E
                       Device Identifier           Device
C1068E(05:00)                                       Info
  └ Enclosure          Direct Attach Devices_       Controller
```

3. Select the hard disk drive to execute physical formatting and press **Enter** key.
Hard disk drives that are installed on the primary CPU/IO module appear after a while.

```
LSI Corp Config Utility      v6.28.00.00 (2009.02.03)
SAS Topology -- SAS1068E
                       Device Identifier           Device
C1068E(05:00)                                       Info
  └ Enclosure          Direct Attach Devices_       Controller
    └ Bay  0           FUJITSU MAY2073RC    2903    SAS
```

4. Select the hard disk drive to execute physical formatting and press **D** key while pressing **Alt** key. "Device Properties" menu appears after a while.

```
LSI Corp Config Utility      v6.28.00.00 (2009.02.03)
Device Properties -- SAS1068E


        Device Identifier   FUJITSU MAY2073RC        2903
        Scan Order          0
        Slot Number         0
        RAID Member         No
        Device Information  SAS
        Disk Capacity (GB)  68
        SAS Address         500000E0:167B0962
        Serial Number       B389P77005LH

        Format_

        Verify
```

5. Select "Format" and press **Enter** key.
   "Device Format" menu appears after a while.

```
LSI Corp Config Utility      v6.28.00.00 (2009.02.03)
Device Format -- SAS1068E

    Device Identifier   FUJITSU MAY2073RC        2903
    SAS Address         500000E0:167B0962
    Serial Number       B389P77005LH

    WARNING!  Format will change the sector size to 512 bytes.
    Format will permanently erase all data on this device!
    Format may take hours to complete and cannot be stopped.
    Press the 'F' key to begin format or any other key to exit.
```

Press **F** key to start formatting.

After the completion of formatting, the following message appears.
Press any key to display "Device Properties" menu.

FORCED SHUTDOWN

Read this section if your server does not operate as expected.

Use this function when an OS command does not
shut down the server, the POWER switch
does not turn off the server, or resetting does not work.

Press and hold the POWER switch on
the server for over 4 seconds.
The power is forcibly turned off. To turn on the power
back again, wait approximately 30 seconds
after the forced shutdown.
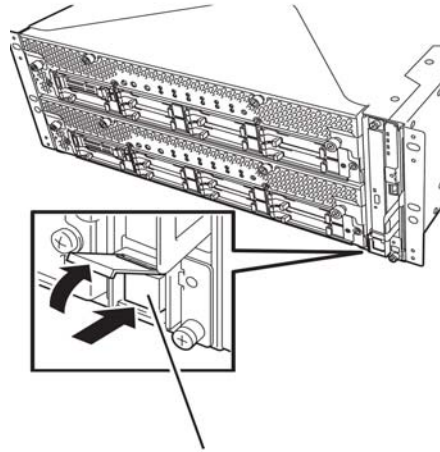
Press it for over 4 seconds.

REMOTE MANAGEMENT FUNCTION

R320a-E4 and R320a-M4 models are equipped with the internal Remote Management function. By connecting their management LAN port to network, you can remotely monitor and control the server such as keyboard, video and mouse (KVM) with BMC (Baseboard Management Controller), a system management LSI. As to the Remote Management Function and how to setup the function, refer to the [EXPRESSSCOPE Engine 2 User's guide (ft-Server version)] stored in the NEC EXPRESSBUILDER DVD.

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Chapter 5

Installing and Using Utilities

This section describes how to use the NEC EXPRESSBUILDER DVD that comes with your server and to install the utilities stored on the NEC EXPRESSBUILDER. CPU/IO module has a processor function part and IO function part. In utilities in this chapter, the processor function part is referred to as CPU module and IO function part PCI module.

NEC EXPRESSBUILDER

The NEC EXPRESSBUILDER, integrated setup software, can automatically detect the hardware connected to an NEC Express5800/ft series machine to advance the processing. The hardware subject to setup with the NEC EXPRESSBUILDER should have the same configuration as that for operation.

Boot Selection Menu

When you insert the NEC EXPRESSBUILDER disk into the optical disk drive and reboot the system, the following menu appears.

```
Boot selection


Os installation···························①
Tool menu................................②
```
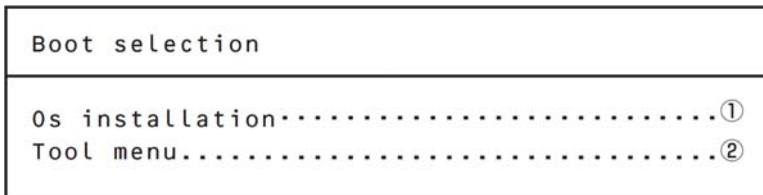
1. Os installation

> **IMPORTANT:**
> Do not select this item on this server. If you do so, the EXPRESSBUILDER Top Menu below appears. Quit EXPRESS BUILDER.
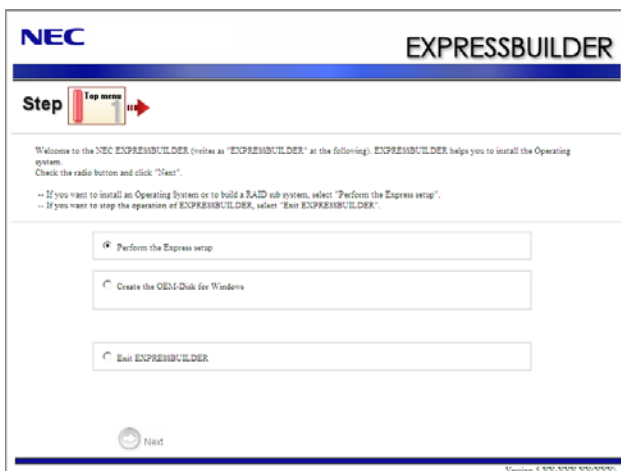
2. Tool menu

If you select this item, the Tool menu appears after choosing the display language.

You can use the below functions for maintenance.

- Maintenance Utility
  Starts up the Offline Maintenance Utility.

- BIOS/FW Updating
  Updates the system BIOS.

- ROM-DOS Startup FD
  Creates Startup Support Disk is used for starting the ROM-DOS system.

- Test and Diagnostics
  Starts up the system test and diagnostics.

- System Management
  Starts up the system management function.

NEC ESMPRO Agent and Manager

NEC Express5800/ft series system management applications "NEC ESMPRO Manager" is bundled
to accessory "NEC EXPRESSBUILDER DVD."
"NEC ESMPRO Agent" is stored in "NEC ESMPRO Agent for VMware"CD-ROM.
This section describes the functions and features provided by NEC ESMPRO Manager and NEC
ESMPRO Agent and the notes on their operations.

These applications are necessary for continuous operation of NEC Express5800/ft series.

Overview

NEC ESMPRO Manager and NEC ESMPRO Agent are the server management software provided
for the stable operation of a server system and effective system operations. They can manage the
configuration information and operating status of server resources to prevent server faults from
occurring. If a server fault occurs, they detect the fault to notify the system Administrator of the
occurrence. This enables the system Administrator to take appropriate action against faults.

- ■ Importance of server management

    "Constantly stable operation" and "less management workload" are keywords in server
    management.

    – Stable operation of server

        Shutdown of a server immediately leads the customer to lose business opportunities
        and profits. This requires servers to always operate in their perfect state. If a fault
        occurs in a server, it is necessary to detect the occurrence as soon as possible, make
        clear the cause, and take appropriate action. The shorter the time taken from the
        occurrence of a fault to the recovery from the fault is, the smaller the loss of profits
        (and/or costs) is.

    – Load reduction of server management

        The server management requires many jobs. In particular, if the system becomes
        large or remote servers are used, required jobs increase further. The reduction of the
        load of the server management brings the decrease in costs (and thus customer's
        benefit).

- ■ What are NEC ESMPRO Manager and NEC ESMPRO Agent?

    NEC ESMPRO Manager and NEC ESMPRO Agent are server management software used
    to manage and monitor NEC Express5800 series systems on the network. The installation
    of NEC ESMPRO Manager and NEC ESMPRO Agent enables the server configuration,
    performance, and fault information to be acquired, managed, and monitored in real time
    and also the occurrence of a fault to be detected immediately by the alert report function.

■ Effects of using NEC ESMPRO Manager and NEC ESMPRO Agent
NEC ESMPRO Manager and NEC ESMPRO Agent have sufficient effects on a variety of
needs in versatile and complicated system environments.

– Detection of server fault
NEC ESMPRO Agent collects a variety of fault information on NEC Express5800
series systems to identify the states of the systems. If a server detects a fault, the
server provides NEC ESMPRO Manager with the proper alert report.

– Prevention of server fault
NEC ESMPRO Agent includes the preventive maintenance function predicting the
occurrence of a fault in advance as countermeasures for preventing faults from
occurring. It can previously detect the empty capacity in a file system.

– Management of server operation status
NEC ESMPRO Agent can acquire the detailed hardware configuration and
performance information on NEC Express5800 series systems. The acquired
information can be viewed at any point through NEC ESMPRO Manager.

– Collective management of distributed servers
NEC ESMPRO Manager provides the GUI interface that allows servers distributed
on the network to be managed efficiently.

Detection of Server Fault

NEC ESMPRO Manager and NEC ESMPRO Agent detect errors causing faults to occur at an early stage and notify Administrators of fault information real-time.

- Early detection of error

  If a fault occurs, NEC ESMPRO Agent detects the fault and reports the occurrence of the fault to NEC ESMPRO Manager (alert report). NEC ESMPRO Manager displays the received alert in the AlertViewer and also changes the status colors of the server and server component in which the fault occurs. This allows you to identify the fault at a glance. Further, checking the content of the fault and the countermeasures, you can take appropriate action for the fault as soon as possible.

- Types of reported faults

  The table below lists the typical faults reported by NEC ESMPRO Agent.

Component	Reported information
CPU	CPU load is over the threshold
Storage	File system usage rate
LAN	Line fault threshold over
	Send retry or send abort threshold over, etc.

Prevention of Server Fault

NEC ESMPRO Agent includes the preventive maintenance function forecasting the occurrence of a fault as countermeasures for preventing faults from occurring.

NEC ESMPRO Manager and NEC ESMPRO Agent can set the threshold for the CPU usage rate and the empty capacity in a file system, etc. in the server. If the value of a source exceeds the threshold, NEC ESMPRO Agent reports the alert to NEC ESMPRO Manager.

The preventive maintenance function can be set for a variety of monitoring items including the CPU usage rate.

Management of Server Operation Status

NEC ESMPRO Agent manages and monitors a variety of components installed in the server. You can view the information managed and monitored by NEC ESMPRO Agent on the DataViewer of NEC ESMPRO Manager.

NEC ESMPRO Agent also manages and monitors components and conditions required to keep the server reliability at a high level such as Hard Disks, CPUs and Memory.

Functional availability on the DataViewer

Function name		Availability	Function outline
Hardware		Unavailable	This function shows the hardware's physical information.
	Memory bank	Unavailable	This function shows the memory's physical information.
	Device information	Unavailable	This function shows the device's unique information.
	CPU	Unavailable	This function shows CPU's physical information.
System		Available	This function shows CPU's logical information and monitors CPU utilization. This function shows memory's logical information and monitors the status.
I/O devices		Available	This function shows information about I/O devices (such as Floppy disk, serial port, parallel port, keyboard, mouse, video).
System environment		Unavailable	This function monitors temperature, fan, voltage, power supply and door.
	Temperature	Unavailable	This function monitors temperature inside of chassis.
	Fan	Unavailable	This function monitors fan.
	Voltage	Unavailable	This function monitors voltage inside of chassis.
	Power supply	Unavailable	This function monitors power supply unit.
	Door	Unavailable	This function monitors chassis intrusion(open/close of cover/door of chassis).
Software		Available	This function shows information about service, driver and OS.
Network		Available	This function shows network (LAN) information and monitors packet.
Expansion device		Unavailable	This function shows information about expansion bus device.
BIOS		Unavailable	This function shows BIOS information.
Local polling		Available	This function monitors values of MIB that agent takes at random.
Storage		Unavailable	This function monitors controllers and storage devices such as HDD.
File system		Available	This function shows file system structure and monitors utilization.
Disk array		Unavailable	This function monitors LSD disk array controller (N8103-73A/80/81) and Promise disk array controller.
Others		Unavailable	This function monitors OS stall by using Watch Dog Timer.

Monitoring (Management) of NEC Express5800/ft series

NEC Express5800/ft series is a fault tolerant system. It can continue the operation even if a major component fails. NEC Express5800/ft series improves the system availability with the hardware, NEC ESMPRO, and system software functions.

If a major component fails, the NEC ESMPRO which has the coordinated report function can notify the system Administrator of the occurrence of the fault. In addition, the Data Viewer of NEC ESMPRO Manager can monitor the system status and also identify the failed component.

The table below lists the NEC Express5800/ft series management tasks using NEC ESMPRO and system functions.

NEC Express5800/ft series management task	NEC ESMPRO function or tool (on managed NEC Express5800/ft series)*	NEC ESMPRO function or tool (on management manager)
Monitoring of major component states	–	–
Diagnosis and start/stop of major components and F/W update	–	–
Verification of alert or verification of fault occurrence event information	syslog (/var/log/messages)	NEC ESMPRO Manager AlertViewer

The report of a fault occurrence in the NEC Express5800/ft series (alert) is immediately sent to the NEC ESMPRO Manager. When the NEC ESMPRO Manager receives the alert, a popup message appears.

The alert contains the detailed information of the fault and the proper countermeasures. You can take the appropriate action for the alert.
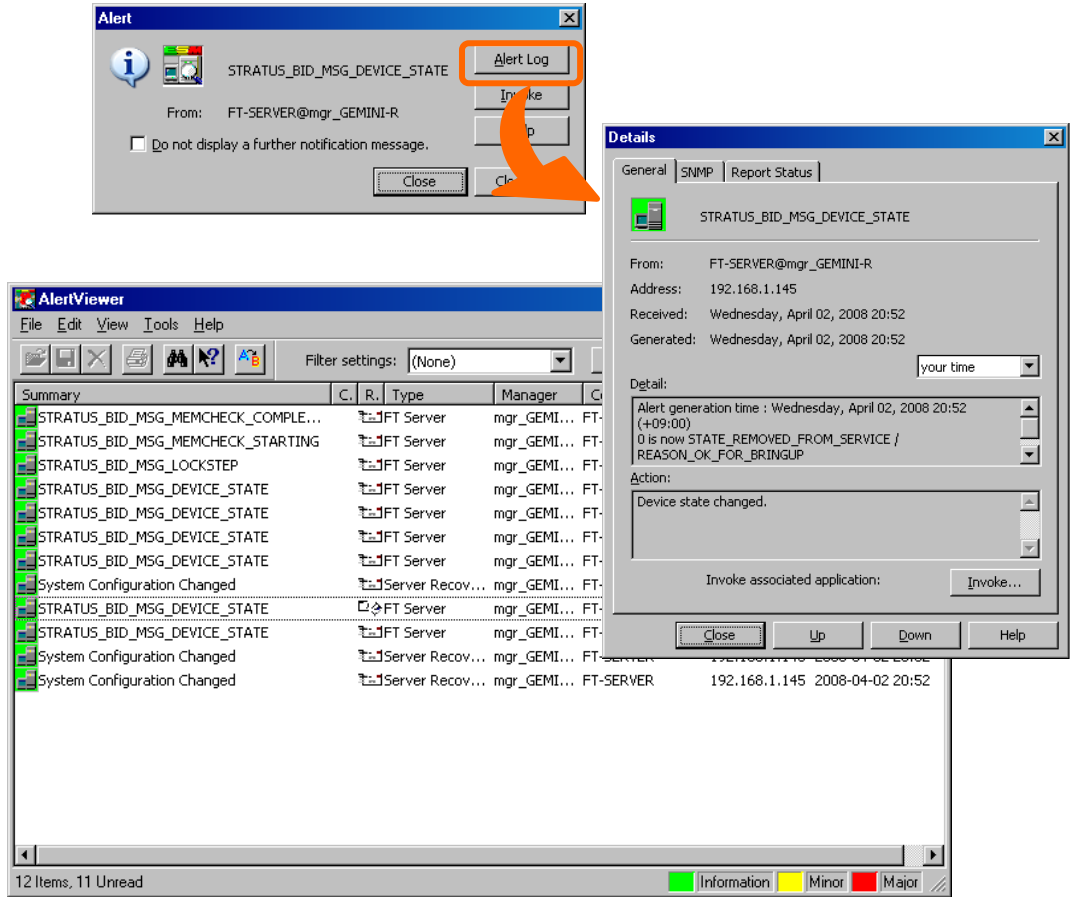
Collective Management of Distributed Servers

The excellent GUI provided by NEC ESMPRO Manager allows servers on a network to be managed collectively. The management screen is designed in the Explorer format to indicate the components in a server hierarchically for effective server management.

NEC ESMPRO Manager manages servers by using the following three types of GUIs.

■ Operation Window

The operation window is used to create the map of servers connected to network to manage them. The map can be multi-layered depending on the installation areas, organizations, and objects.
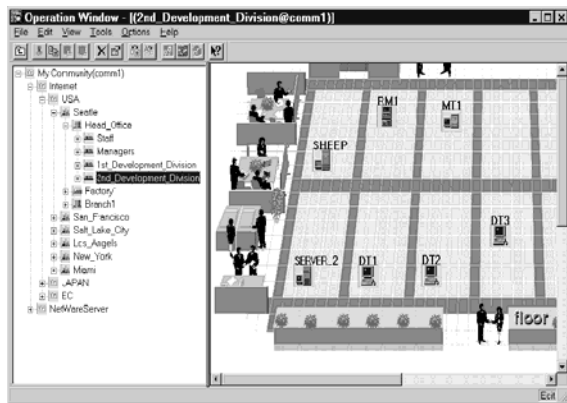
■ DataViewer

The DataViewer indicates the server source configuration information in the Explorer format. In addition, it changes the status color of the failed server component. This enables you to identify the failed portion.
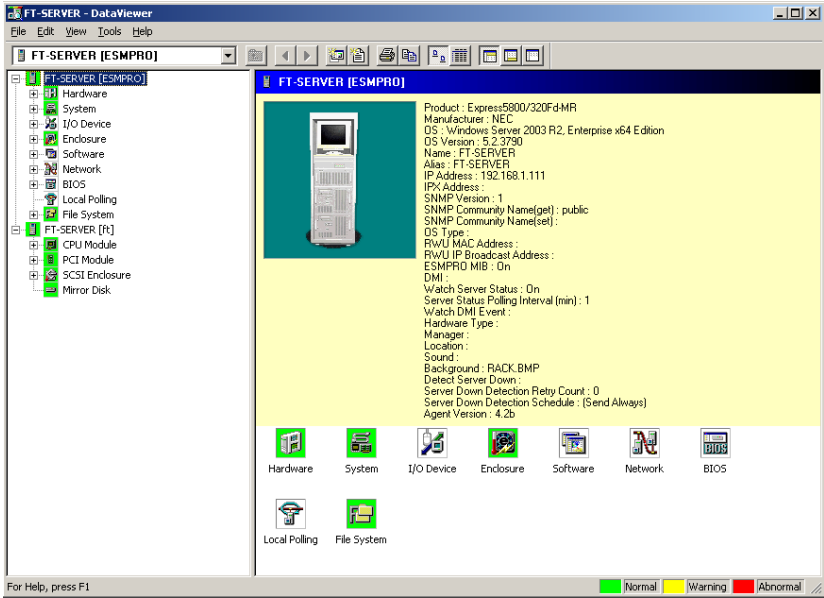
■ AlertViewer

The AlertViewer manages fault reports sent from servers together. A fault occurred in a server is immediately reported to the AlertViewer.

The Administrator can recognize all faults on the network instantly.
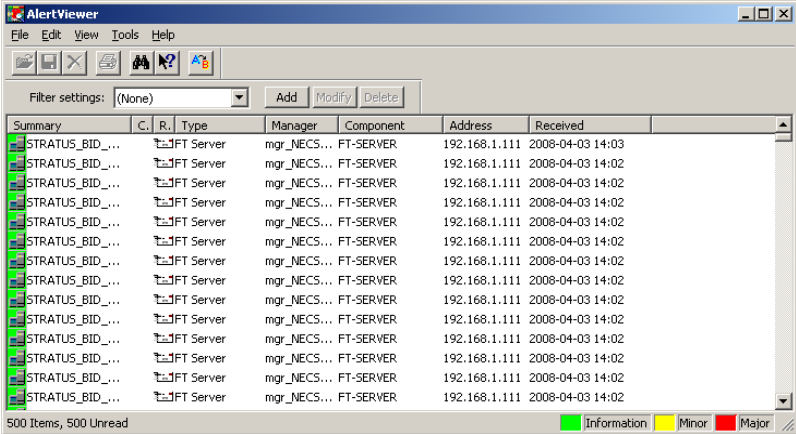
NEC ESMPRO Agent

NEC ESMPRO Agent is a utility which acts as an agent (proxy) between NEC Express5800/ft series and NEC ESMPRO Manager (management PC). For details on the operating environment, the setting required before the setup, and the installation procedure, see the separate volume "User's Guide (Setup)."

Device ID in Alert Report

Some NEC Express5800/ft series reports use unique device IDs which correspond to the devices listed in the table below as the device identification information.

Refer to "Device Path Enumeration" in Chapter 3 "ESX Operation and Configuration" for details.

Supplement

When using NEC ESMPRO Agent, see "NAMES AND FUNCTIONS OF COMPONENTS" in Chapter 2.

Notice on Operation of NEC ESMPRO Agent

- It may become unable to send report after recovering from hardware failure.

   <Workaround>
   Execute the following operation after hardware failure recovery.
   After replacing the hardware, confirm the status LED 2 on both CPU/IO modules are green (duplex mode) and log on as a user with root priviledge to execute the following command.

      # /opt/nec/esmpro_sa/bin/ESMRestart

   * For the status LED position, refer to "NAMES AND FUNCTIONS OF COMPONENTS" of Chapter 2 "General Description" in User's Guide.

- The following message may be registered on the syslog when starting the system.

      "ntagent: libft init failed"

   <Workaround>
   When ESMftreport/ESMps process does not work, login as a root user and execute ESMRestart.

   <Process confirmation procedure>
      # ps aux | grep ESM

   <ESMRestart executing procedure>

      # /opt/nec/esmpro_sa/bin/ESMRestart

File System Monitoring

On the file system monitoring of NEC ESMPRO Agent, vmfs areas are not monitored.

Maintenance-related Functions

When you want to use maintenance-related functions of the NEC Express5800/ft series, contact your maintenance personnel.

Update Interval Setting of DataViewer

Update interval setting of DataViewer must be 60 seconds as the default setting or more.
If the interval setting of Dataviewer is set less than 60 seconds while Dataviewer is launching, the notification may delay or may leak.

About portmap

NEC ESMPRO Agent uses portmap function.

If portmap stops or NEC ESMPRO Agent reboots while NEC ESMPRO Agent is operating, NEC ESMPRO Agent does not work appropriately.

Run the following command and reboot NEC ESMPRO Agent.

    # /opt/nec/esmpro_sa/bin/ESMRestart

ntagent Memory Usage

When dataviewer appears, the memory usage of ntagent increases about 10KB per hour. Do not always display dataviewer, but display it only when failure occurs.

USB Device and Window Displaying

On dataviewer window of NEC ESMPRO Manager, if mouse, keyboard or display apppears because USB is disabled, the details are shown as unknown.

LAN Monitoring Report

The LAN monitoring function defines the line status depending on the number of transmission packets and the number of packet errors within a certain period. Thus, the LAN monitoring function may report a line fault or high line load only in a temporary high line impedance state. If a normal state recovery is reported immediately, temporal high line impedance may have occurred thus there is not any problem.

LAN Monitoring Threshold

Because the NEC Express5800/ft series detects hardware faults on the network in the driver level, NEC ESMPRO Agent does not monitor line faults. Thus, the value set for "Line fault occurrence rate" of a [LAN] tab of [NEC ESMPRO Agent properties] in the control panel is not used.

Change of SNMP Community

If the security setting of the SNMP Service of a system, where the NEC ESMPRO Agent is installed,
is changed from the default "public" to a community name, change the community settings of the NEC ESMPRO Agent, too.

>   **1.** Log on as a user with root privilege

>   **2.** Move to the directory where the control panel of NEC ESMPRO Agent is stored.

>   # cd/opt/nec/esmpro_sa/bin

>   **3.** Start the control panel.

>   # ./ESMagntconf

>   The Control Panel window appears.

>   **4.** Click [General].
>   The [General Properties] window appears.

>   **5.** Select a SNMP community name used when you retrieve local machine information in the [SNMP Community] box. (Select by "↑" key or "↓" key.)

>   **6.** Click [OK] to quit.

The Detail Information of Alert

Detail information of some alert displayed on the alert viewer may be displayed as "Unknown."

Change Settings of File System Monitoring Function

New settings in thresholds of monitoring interval and free space monitoring are not reflected immediately after they are changed. They are reflected at the next monitoring interval of monitoring service.

File System Monitoring on the system using NEC EXPRESSCLUSTER

When using NEC ESMPRO Agent in the cluster environment configured by NEC EXPRESSCLUSTER, there is the following limitation:
If a failover occurs, the settings of the threshold for the empty space monitoring function and the enable/disable of monitoring of the operating sever are not inherited to the standby server. Make sure to reset the threshold and the enable/disable of monitoring on the standby server.

CPU Load Ratio of snmpd Service

While monitoring the server from NEC ESMPRO Manager, the CPU load ratio of snmpd Service on the NEC ESMPRO Agent side may increase at every monitoring interval (default: 1 minute). NEC ESMPRO Manager and NEC ESMPRO Agent exchange information through snmpd Service. If the server status monitoring by NEC ESMPRO Manager is on (default: ON), NEC ESMPRO Manager regularly issues a request to NEC ESMPRO Agent to get the current status of the server. In response, NEC ESMPRO Agent checks the status of the server. As a result, the CPU load ratio of snmpd Service increases temporarily.

If you have trouble of terminating a movie player application, turn off the server status monitoring by NEC ESMPRO Manager or extend the monitoring interval.

Hang of snmpd Service

Snmpd Service has a module called "SNMP Extended Agent." This module may be registered when you install some software that uses snmpd Service.

If you start snmpd Service, SNMP Extended Agent is also loaded at the initialization. However, if the initialization is not completed within a specified period, snmpd Service will hang.

It may take time to complete the initialization due to temporary high load on the system. In this case, wait for the system load become low enough before restarting snmpd Service.

Shutdown Monitoring

When performing shutdown monitoring, all shutdown processes are to be monitored. If there is an application that performs shutdown without rebooting OS or turning off the power, set the timeout value longer or disable the monitoring function.

CPU Information

In [CPU Information] of DataViewer's system tree, the external clock is listed as "Unknown."

Display of Keyboard and Mouse of DataViewer

Also in the state that is unconnected with a Keyboard and Mouse, DataViewer of NEC ESMPRO Manager displays Keyboard and Mouse.

NEC Express5800/ft series maintenance

The ftsmaint command provides a control interface for managing your NEC Express5800/ft series system's fault-tolerant functions. For information about using the ftsmaint command and using device path enumeration to manage specific devices in your system, see the following sections:

ftsmaint command
Device Path Enumeration
ftsmaint Examples

ftsmaint Command

Component information

- ftsmaint ls *path*

This command displays the status of the hardware specified by the enumerated path.
Specifying a path displays a detailed status of the hardware at that path.
Omitting the *path* argument displays a less-detailed table of all fault-tolerant devices on the system. See "**Device Path Enumeration**" for more information.
Output from ftsmaint ls *path* reflects what the ftSSS management software reports about the state of a given component. Because of system latency, this may not reflect the immediate state of the device.
To verify the actual state of the device, check the opstate of its LED.

Start/stop the component

- ftsmaint bringDown *path*

This command removes from service the CPU module, PCI module, or internal disk specified by *path*. No other devices are supported. When you bring down a device, the effect on the system is the same as physically removing it.

> #### Caution:
>
> When manually bringing down a component, it is possible that a whole CPU/IO module will be taken out of service. Be careful to bring down a component only when the system is fully duplexed.

- ftsmaint bringUp *path*

This command brings into service the CPU module, PCI module, or internal disk specified by `path`. No other devices are supported.

> #### Note:
>
> Running the `ftsmaint bringUp` command on a CPU module degrades system performance and halts network communications for up to a minute.

MTBF clear

- ftsmaint clearMtbf *path*

This command clears the MTBF value of the CPU module, PCI module, or PCI module slot specified by *path*.

Note:

Do not use this feature to retain a faulty or degraded device in service. It may be useful if the MTBF for a device has been degraded by testing or a configuration error.

Diagnostics

- ftsmaint runDiag *path*

This command starts diagnostics on the CPU module or PCI module specified by *path*.

Dump collection

- ftsmaint dump *path*

This command generates a dump of the CPU module specified in the *path* argument. CPU dumps are stored in /var/crash/*YYYY-MM-DD-hh-mm/vmcore.*
VMkernel dumps are stored in /root/vmkernel-zdump-*MMDDYY.hh:mm:n,*
/root/vmkernel-dumpinfo-*MMDDYY.hh:mm:n*.txt

Device Path Enumeration

Some subsystems and components of the NEC Express5800/ft series system are addressable by device path IDs. Device path IDs uniquely identify the devices in an NEC Express5800/ft series system.

Table 1 lists the device path IDs for devices in an NEC Express5800/ft series system. In Table 1, IDs in the format **:*nn.n* (for example, 0b:00.0) indicate PCI bus, slot, and function. These numbers may change as a result of normal system events. Therefore, devices in your system may appear with different IDs in command output from ftsmaint and other commands. The values for such devices are provided here as representative sample data only.

Table 1. Device Paths of the NEC Express5800/ft series Devices

Device	Path	
	CPU Module 0	**CPU Module 1**
CPU Module	0	1
DIMMs (addressed by slot)	0/1—0/12	1/1—1/12
Processors	0/21、0/22	1/21、1/22
Temperature #n sensor	0/130	1/130
Fan #n sensors	0/140—0/144	1/140—1/144
Voltage sensors	0/150—0/155	1/150—1/155
	PCI Module 0	**PCI Module 1**
PCI Module	10	11
PCI Slot devices	10/1,10/2 10/3,10/4	11/1,11/2 11/3,11/4
Internal Disk controller	10/5	11/5
SCSI Storage controller : LSI Logic	05:00.0	3f:00.0
Network controller Ethernet controller: Intel Corporation82 Network interface Ethernet controller: Intel Corporation82 Network interface	10/6 0b:00.0 vmnic100600 0b:00.1 vmnic100601	11/6 45:00.0 vmnic110600 45:00.1 vmnic110601
Display controller VGA compatible controller: Matrox graphic	10/7 0c:00.0	11/7 46:00.0
Serial bus controllers USB controller: Intel Corporation 82801JI	10/8 0a:1a.0, 0a:1a.7	11/8 44:1a.0, 44:1a.7
Serial bus controllers USB controller: Intel Corporation 82801JI	10/9 0a:1d.0, 0a:1d:1, 0a:1d:2, 0a:1d.7	11/9 44:1d.0, 44:1d:1, 44:1d:2, 44:1d.7
Bridge	10/10	11/10
Storage enclosure Internal Disk Drive 1-8	10/40 10/40/1- 10/40/8	11/40 11/40/1- 11/40/8
2xPCIe	10/70	11/70
Baseboard Management Controller	10/120	11/120

Figure 1 and Figure 2 show the locations of the major enumerated devices.

Figure 1. Locations of Major Enumerated Devices (Front View)

dco001g
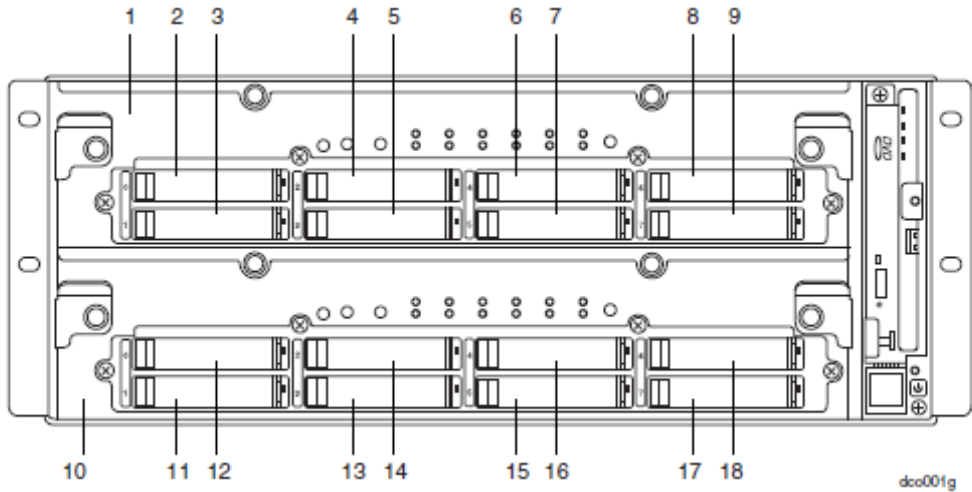
Callout	Device	Device ID	Physical Label
1	CPU/IO Module0	CPU-0, I/O-10	
2	Internal disk drive:1	10/40/1	0
3	Internal disk drive:2	10/40/2	1
4	Internal disk drive:3	10/40/3	2
5	Internal disk drive:4	10/40/4	3
6	Internal disk drive:5	10/40/5	4
7	Internal disk drive:6	10/40/6	5
8	Internal disk drive:7	10/40/7	6
9	Internal disk drive:8	10/40/8	7
10	CPU/IO Modile1	CPU-1, I/O-11	
11	Internal disk drive:1	11/40/1	0
12	Internal disk drive:2	11/40/2	1
13	Internal disk drive:3	11/40/3	2
14	Internal disk drive:4	11/40/4	3
15	Internal disk drive:5	11/40/5	4
16	Internal disk drive:6	11/40/6	5
17	Internal disk drive:7	11/40/7	6
18	Internal disk drive:8	11/40/8	7

Figure 2.. Locations of Major Enumerated Devices（Rear View）
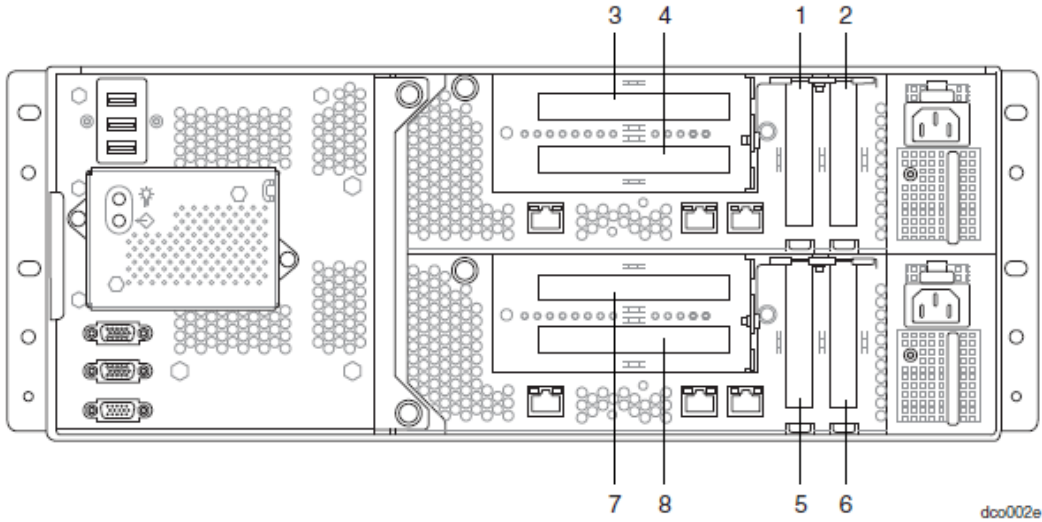
Callout	Component	Device ID
1	PCI module 0 PCI Slot 1	10/1
2	PCI module 0 PCI Slot 2	10/2
3	PCI module 0 PCI Slot 3	10/3
4	PCI module 0 PCI Slot 4	10/4
5	PCI module 1 PCI Slot 1	11/1
6	PCI module 1 PCI Slot 2	11/2
7	PCI module 1 PCI Slot 3	11/3
8	PCI module 1 PCI Slot 4	11/4

ftsmaint Examples

The following sections provide examples of how to use the ftsmaint command

Displaying System Status

To display the status of the fault-tolerant devices and subsystems in your NEC Express5800/ft series system, issue the following command:

    # **ftsmaint ls**

Example 1 shows typical output for this command.

Example 1. Displaying System Status with the ftsmaint Command

```
H/W Path Description                              State    OPState   FRev   Fct
================================================================================
0        Combined CPU/IO                          ONLINE   DUPLEX    *      0
0/1      DIMM                                     ONLINE   ONLINE    -      -
0/2      DIMM                                     MISSING  EMPTY     -      -
0/3      DIMM                                     ONLINE   ONLINE    -      -
0/4      DIMM                                     MISSING  EMPTY     -      -
0/5      DIMM                                     MISSING  EMPTY     -      -
0/6      DIMM                                     MISSING  EMPTY     -      -
0/7      DIMM                                     MISSING  EMPTY     -      -
0/8      DIMM                                     MISSING  EMPTY     -      -
0/9      DIMM                                     MISSING  EMPTY     -      -
0/10     DIMM                                     MISSING  EMPTY     -      -
0/11     DIMM                                     MISSING  EMPTY     -      -
0/12     DIMM                                     MISSING  EMPTY     -      -
0/21     Intel(R) Xeon(R) CPU E5504 @ 2.00GHz     ONLINE   ONLINE    -      -
0/130    Baseboard Temp#0 Sensor                  -        NORMAL    -      -
0/140    Baseboard Fan1#0 Sensor                  -        NORMAL    -      -
0/141    Baseboard Fan2#0 Sensor                  -        NORMAL    -      -
0/142    Baseboard Fan3#0 Sensor                  -        NORMAL    -      -
0/143    Baseboard Fan4#0 Sensor                  -        NORMAL    -      -
0/144    Baseboard Fan5#0 Sensor                  -        NORMAL    -      -
1        Combined CPU/IO                          ONLINE   DUPLEX    *      0
1/1      DIMM                                     ONLINE   ONLINE    -      -
1/2      DIMM                                     MISSING  EMPTY     -      -
1/3      DIMM                                     ONLINE   ONLINE    -      -
1/4      DIMM                                     MISSING  EMPTY     -      -
1/5      DIMM                                     MISSING  EMPTY     -      -
1/6      DIMM                                     MISSING  EMPTY     -      -
1/7      DIMM                                     MISSING  EMPTY     -      -
1/8      DIMM                                     MISSING  EMPTY     -      -
1/9      DIMM                                     MISSING  EMPTY     -      -
1/10     DIMM                                     MISSING  EMPTY     -      -
1/11     DIMM                                     MISSING  EMPTY     -      -
1/12     DIMM                                     MISSING  EMPTY     -      -
1/21     Intel(R) Xeon(R) CPU E5504 @ 2.00GHz     ONLINE   ONLINE    -      -
1/130    Baseboard Temp#1 Sensor                  -        NORMAL    -      -
1/140    Baseboard Fan1#1 Sensor                  -        NORMAL    -      -
1/141    Baseboard Fan2#1 Sensor                  -        NORMAL    -      -
1/142    Baseboard Fan3#1 Sensor                  -        NORMAL    -      -
1/143    Baseboard Fan4#1 Sensor                  -        NORMAL    -      -
1/144    Baseboard Fan5#1 Sensor                  -        NORMAL    -      -
10       Combined CPU/IO                          ONLINE   DUPLEX    -      0
10/1     -                                        MISSING  EMPTY     -      -
```

```
10/2      -                                             MISSING  EMPTY    -       -
10/5      Mass Storage Ctlr                             ONLINE   DUPLEX   -       0
05:00.0   SCSI storage controller: LSI Logic / Symb     ONLINE   DUPLEX   -       -
10/6      Network Ctlr ONLINE DUPLEX - 0
0b:00.0   Ethernet controller: Intel Corporation 82     ONLINE   ONLINE   -       -
vmnic100600 Network Interface                           ONLINE   DUPLEX   -       -
0b:00.1   Ethernet controller: Intel Corporation 82     ONLINE   ONLINE   -       -
vmnic100601 Network Interface                           ONLINE   DUPLEX   -       -
10/7      Display Ctlr                                  ONLINE   DUPLEX   -       0
0c:00.0   VGA compatible controller: Matrox Graphic     ONLINE   DUPLEX   -       -
10/8      USB Serial Bus Ctlr                           ONLINE   ONLINE   -       0
0a:1a.0   USB Controller: Intel Corporation Unknown     ONLINE   ONLINE   -       -
0a:1a.7   USB Controller: Intel Corporation Unknown     ONLINE   ONLINE   -       -
10/9      USB Serial Bus Ctlr                           ONLINE   ONLINE   -       0
0a:1d.0   USB Controller: Intel Corporation Unknown     ONLINE   ONLINE   -       -
0a:1d.1   USB Controller: Intel Corporation Unknown     ONLINE   ONLINE   -       -
0a:1d.2   USB Controller: Intel Corporation Unknown     ONLINE   ONLINE   -       -
0a:1d.7   USB Controller: Intel Corporation Unknown     ONLINE   ONLINE   -       -
10/10     Bridge                                        ONLINE   ONLINE   -       0
10/40     Internal Disk Enclosure                       -        -        -       -
10/40/1   Disk Drive                                    ONLINE   DUPLEX   N005    0
10/40/2   Disk Drive                                    ONLINE   DUPLEX   N005    0
10/70     RISER_EMPTY Riser Card                        -        -        -       -
10/120    Baseboard Management Ctlr                     ONLINE   DUPLEX   *       -
11        Combined CPU/IO                               ONLINE   DUPLEX   -       0
11/1      -                                             MISSING  EMPTY    -       -
11/2      -                                             MISSING  EMPTY    -       -
11/5      Mass Storage Ctlr                             ONLINE   DUPLEX   -       0
3f:00.0   SCSI storage controller: LSI Logic / Symb     ONLINE   DUPLEX   -       -
11/6      Network Ctlr                                  ONLINE   DUPLEX   -       0
45:00.0   Ethernet controller: Intel Corporation 82     ONLINE   ONLINE   -       -
vmnic110600 Network Interface                           ONLINE   DUPLEX   -       -
45:00.1   Ethernet controller: Intel Corporation 82     ONLINE   ONLINE   -       -
vmnic110601 Network Interface                           ONLINE   DUPLEX   -       -
11/7      Display Ctlr                                  ONLINE   DUPLEX   -       0
46:00.0   VGA compatible controller: Matrox Graphic     ONLINE   DUPLEX   -       -
11/8      USB Serial Bus Ctlr                           ONLINE   ONLINE   -       0
44:1a.0   USB Controller: Intel Corporation Unknown     ONLINE   ONLINE   -       -
44:1a.7   USB Controller: Intel Corporation Unknown     ONLINE   ONLINE   -       -
11/9      USB Serial Bus Ctlr                           ONLINE   ONLINE   -       0
44:1d.0   USB Controller: Intel Corporation Unknown     ONLINE   ONLINE   -       -
44:1d.1   USB Controller: Intel Corporation Unknown     ONLINE   ONLINE   -       -
44:1d.2   USB Controller: Intel Corporation Unknown     ONLINE   ONLINE   -       -
44:1d.7   USB Controller: Intel Corporation Unknown     ONLINE   ONLINE   -       -
11/10     Bridge                                        ONLINE   ONLINE   -       0
11/40     Internal Disk Enclosure                       -        -        -       -
11/40/1   Disk Drive                                    ONLINE   DUPLEX   N005    0
11/40/2   Disk Drive                                    ONLINE   DUPLEX   N005    0
11/70     RISER_EMPTY Riser Card                        -        -        -       -
11/120    Baseboard Management Ctlr                     ONLINE   DUPLEX   *       -
```

IO Enclosure 11 is the Active Compatibility Node.
This is an NEC Express5800/R320a-E4 system, P-Package N8800-149, Serial# 0200149.
* Use lsLong to see this value.

Displaying the Status of a Single System Component

Before you remove a component that is duplexed for fault tolerance, verify that it is not in a simplex state. To verify the state of a component, type a command in the following format:

ftsmaint ls *path*

For *path*, specify the correct value for the component, as listed in Table 1.
The value of Op State specifies whether the device is in a simplex state: the value is generally either DUPLEX or SIMPLEX.
The following examples demonstrate some common commands and the resulting output.

In Example 2, the PCI module 1 is listed as having a State of ONLINE and an OP State of DUPLEX. The value of SECONDARY for Reason indicates that it is operating as the backup I/O element

Example 2. Viewing the State of the Bottom PCI module

 # ./ftsmaint ls 11

H/W Path	: 11
Description	: Combined CPU/IO
State	: ONLINE
Op State	: DUPLEX
Reason	: SECONDARY
Modelx	: 243-633635
Artwork Rev	: 0
ECO Level	: 0
Min Partner ECO Level	: 0
Serial #	: 2BA060026
Active Compat Node	: false
Logic Revision	: 346
MTBF Policy	: useThreshold
MTBF fault class	: uncorrectable
Fault Count	: 0
Last Timestamp	: -
Replace Threshold	: 0
Evict Threshold	: 21600
Value	: 0
Minimum Count	: 4

In Example 3, the disk in the PCI module 1 is listed as having a State of ONLINE and an Op State of DUPLEX.

Example 3. Viewing the State of Disk 11/40/1

 # ./ftsmaint ls 11/40/1

H/W Path	: 11/40/1	
Description	: Disk Drive	
State	: ONLINE	
Op State	: DUPLEX	
Reason	: NONE	
Modelx	: SEAGATE:ST973452SS	
Firmware Rev	: N005	
Serial #	: 3TA0YQ9300009027VXBA	
Device Name	: disk_i	
Udev Device Names	: -	
Kernel Device Names	: vmhba110500:C0:T0:L0	
MTBF Policy	: useThreshold	
MTBF fault class	: critical	noncritical
Fault Count:	: 0	0
Last Timestamp:	: -	-
Replace Threshold	: 0	0
Evict Threshold	: 2147483647	604800
Value	: 0	0
Minimum Count	: 1	4

Bringing System Components Down and Up

You can use the ftsmaint command to bring down and restart fault-tolerant components. After bringing up a component, the system attempts to synchronize and duplex the corresponding component automatically.

For example, the first command below brings down the PCI module 1; the second command brings it back up and, if possible, automatically resynchronizes the PCI module 0 with the PCI module 1:

> # **/opt/ft/bin/ftsmaint bringDown 11**
> # **/opt/ft/bin/ftsmaint bringUp 11**

When you issue the bringUp command, the system should automatically synchronize, the RAID array drives should update and become mirrored, and the system should resume duplex operation.

Diagnostics

To start diagnostics on the module, issue the following command

> ftsmaint runDiag *path*

Before starting diagnostics, you need to bring down the module to be diagnosed. For example, use the following commands to start diagnostics on CPU module 1.

> # **/opt/ft/bin/ftsmaint bringDown 1**
> # **/opt/ft/bin/ftsmaint runDiag 1**

Check the Op State by the following command.

> # **/opt/ft/bin/ftsmaint ls 1**

H/W Path	: 1		
Description	: Combined CPU/IO		
State	: ONLINE		
Op State	: DUPLEX		
Reason	: SECONDARY		
Modelx	: 243-633635		
Firmware Rev	: BIOS Version 4.1:82		
Artwork Rev	: 0		
ECO Level	: 0		
Min Partner ECO Level	: 0		
Serial #	: 2AK110017		
Logic Revision	: 345		
MTBF Policy	: useThreshold		
MTBF fault class	: correctable	uncorrectable	microsync
Fault Count	: 0	0	0
Last Timestamp	: -	-	-
Replace Threshold	: 0	0	1728
Evict Threshold	: 1800	21600	0

Value	: 0	0	0
Minimum Count	: 8	4	50

Dump collection

The following command example generates a dump of the CPU module 0.The system must   be running in duplex mode for you to use this method.

/opt/ft/bin/ftsmaint dump 0

CPU dumps are stored in /var/crash/*YYYY-MM-DD-hh-mm*/vmcore.
VMkernel dumps are stored in:
/root/vmkernel-zdump-*MMDDYY.hh:mm:n*
/root/vmkernel-dumpinfo-*MMDDYY.hh:mm:n*.txt

NEC DianaScope

NEC DianaScope is software for remote management of NEC Express5800/ft series.
For features and installation of NEC DianaScope, see "NEC DianaScope Online Document" in "NEC EXPRESSBUILDER."
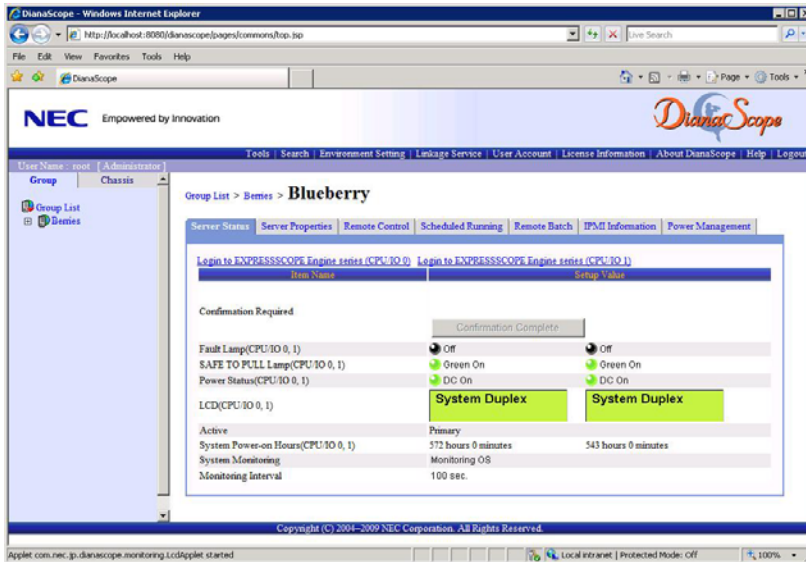
TIPS:

To use NEC DianaScope with NEC Express5800/ft series, appropriate server license is required.

- UL1198- 001E DianaScope Additional Server License (1)

  License for managing one server.

- UL1198- 011E DianaScope Additional Server License (10)
  License for managing ten servers.

This server comes with one license of NEC DianaScope.

Notes

The online document provides general descriptions of overall servers to be remotely managed by NEC DianaScope, but this section indicates notes that require special attention for remotely managing this server using NEC DianaScope.

- When remotely managing this server from NEC DianaScope, only LAN connection is available. Direct connection and connection via modem are not supported.
- NEC DianaScope cannot power off, power cycle or reset the server. NEC Express5800/ft series does not support such functions.
- NEC DianaScope Agent is not supported on this model.

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Chapter 6

Maintenance

This chapter describes the daily maintenance of NEC Express5800/ft series and precautions when relocating or storing the server.

DAILY MAINTENANCE

To use your NEC Express5800/ft series in best condition, check and maintain regularly as described below. If an error is found on your NEC Express5800/ft series, consult your sales agent.

Checking Alert

Monitor the failure occurrence by NEC ESMPRO during the system operation.

Always check whether any alert is reported to NEC ESMPRO Manager on the management PC. Check whether any alert is reported on the Operation Window, DataViewer, or Alert Viewer of NEC ESMPRO Manager.

Viewers of NEC ESMPRO

Operation Window
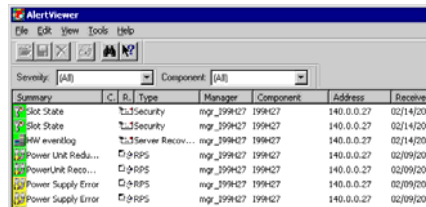
Alert Viewer
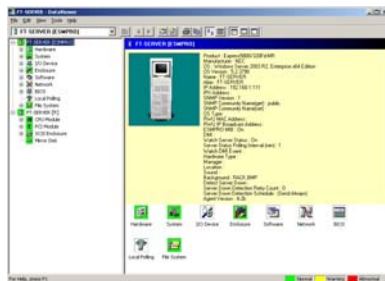
Data Viewer

Checking STATUS LEDs

Check the LED indication on the front of the NEC Express5800/ft series, on hard disks installed in 2.5-inch hard disk drive bay, or on LCD display when the server is powered on or powered off by the shut down operation. The functions and indications of LEDs are described in Chapter 2. If any indication that shows an error, contact your sales agent.

Cleaning

Clean the server on a regular basis to keep the server in a good shape.

⚠ WARNING
Observe the following instructions to use the server safely. There are risks of death or serious personal injury. See "PRECAUTIONS FOR SAFETY" in Chapter 1. • Do not disassemble, repair, or alter the server. • Do not look into the DVD-ROM drive. • Disconnect the power plug before cleaning the server.

Cleaning the NEC Express5800/ft series

For daily cleaning, wipe the external surfaces of the server with a dry soft cloth. Follow the procedure below if stains remain on the surfaces:

IMPORTANT:

■ To avoid altering the material and color of the server, do not use volatile solvents such as thinner or benzene to clean the server.

■ The power receptacle, the cables, the connectors on the rear panel of server, and the inside of the server must be kept dry. Do not moisten them with water.

1. Make sure that the server is powered off.

2. Unplug the power cord of the server from a power outlet.

3. Wipe off dust from the power cord plug with a dry cloth.

4. Soak a soft cloth in neutral detergent that is diluted with cold or warm water, and squeeze it firmly.

5. Rub off stains on the server with the cloth prepared in Step 4.

6. Soak a soft cloth in water, squeeze it firmly and wipe the server with it once again.

7. Wipe the server with a dry cloth.

8. Wipe off dust from the fan exhaust opening on the rear of the server with a dry cloth.

Cleaning the Keyboard and Mouse

IMPORTANT:

A keyboard and a mouse use USB interface. Therefore it is not necessary to power off the server when connecting or disconnecting them.

Disconnect the keyboard from the server while the devices in the system (the server and the peripheral devices) remain turned on. Wipe the keyboard surface with a dry cloth. Then connect the keyboard to the server.

The mouse operation depends on the degree of smoothness of the internal ball rotation. To keep the mouse ball clean, use the mouse in a place with little dust. Follow the steps below to clean the mouse regularly:

1. Disconnect the mouse from the USB port of the keyboard while the server remains powered on.

2. Turn the mouse upside down, and rotate the mouse ball cover counterclockwise to remove it. Take out the ball from the mouse.

3. Wipe the mouse ball with a dry soft cloth.

    If stains remain, use a soft cloth to wipe them off. Soak the soft cloth in neutral detergent that is diluted with water or warm water, and squeeze it firmly.

4. Wipe three small rollers inside the mouse with cotton swab.

    Use the cotton swab soaked with alcohol if stains remain.

5. Put the mouse ball back into the mouse.

    If the mouse or rollers are wet in steps 3 and 4, put it back after fully dried.

6. Place the mouse ball cover, and rotate it clockwise until it is locked.

7. Connect the mouse to the server .
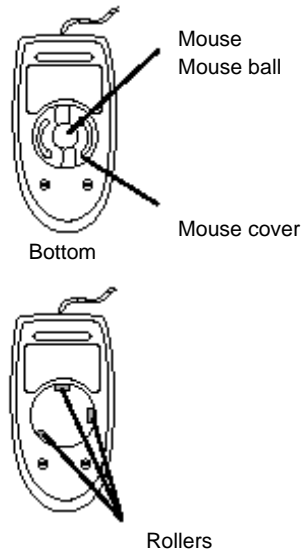
Cleaning the Floppy Disk Drive

A read/write error may occur due to stains on the read/write head of the floppy disk drive.

Use the cleaner dedicated for floppy disk drive to clean the read/write head. It is recommended to clean the head on regular basis.

Cleaning DVD/CD-ROM

A dusty DVD/CD-ROM or dust-accumulated tray causes the device to fail to read data correctly.

Follow the procedure below to clean the tray and DVD/CD-ROM regularly:

1. Make sure that the server is powered on.

2. Press the Eject button on the front of the DVD-ROM drive.
    The tray comes out.

3. Hold the DVD/CD-ROM lightly and take it out from the tray.

    > **IMPORTANT:** Do not touch the signal side of the DVD/CD-ROM with your hand.

4. Wipe the tray with a dry soft cloth.

    > **IMPORTANT:** Do not wipe the lens of the DVD-ROM drive. Doing so may damage the lens and may cause a malfunction of the drive.

5. Gently push on the tray front to close the tray.

6. Wipe the signal side of the CD/DVD-ROM with a dry soft cloth.

    > **IMPORTANT:** Wipe DVD/CD-ROMs from the center to the outside. Use only CD-ROM cleaner if necessary. Cleaning a DVD/CD-ROM with record spray/cleaner, benzene, or thinner causes damage to the DVD/CD-ROM contents. At worst, inserting the DVD/CD-ROM into the server may cause failure.
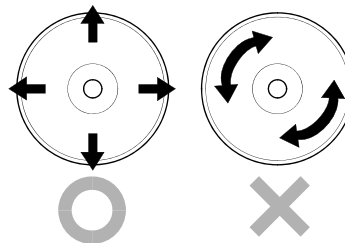
SYSTEM DIAGNOSTICS

The System diagnostics runs several tests on the server.

Select [Tool menu] - [Test and diagnostics] in the NEC EXPRESSBUILDER to diagnose the system.

Test Items

The following items are tested in system diagnostics.

- Memory
- CPU cache memory
- Hard disk drive used as a system

IMPORTANT:

When executing the system diagnostics, make sure to remove the LAN cable. Executing the system diagnostics with the LAN cable connected, the network may be influenced.

TIPS:

On checking the hard disk drive, no data is written into the disk.

Startup and Exit of System Diagnostics

Follow the steps below to start the system diagnostics. (If the server is running, shut it down, and execute Step 1 through Step 12.)

1. Shutdown the OS, and power off the server. Then, unplug the power cord.

2. Disconnect all the LAN cables from the server.

3. Plug the power cord and power on the server.

4. Use the NEC EXPRESSBUILDER DVD to start the system.

5. Select [Tool menu].

TIPS:

If the system displays the [Language Selection] menu, select [English].

6.   Select [Test and diagnostics].

Select [End-User Mode] and the system diagnostics starts. The diagnostics will be completed in approximately three minutes.
When the diagnostics is completed, the screen of the display changes as shown below:

Diagnostics tool title
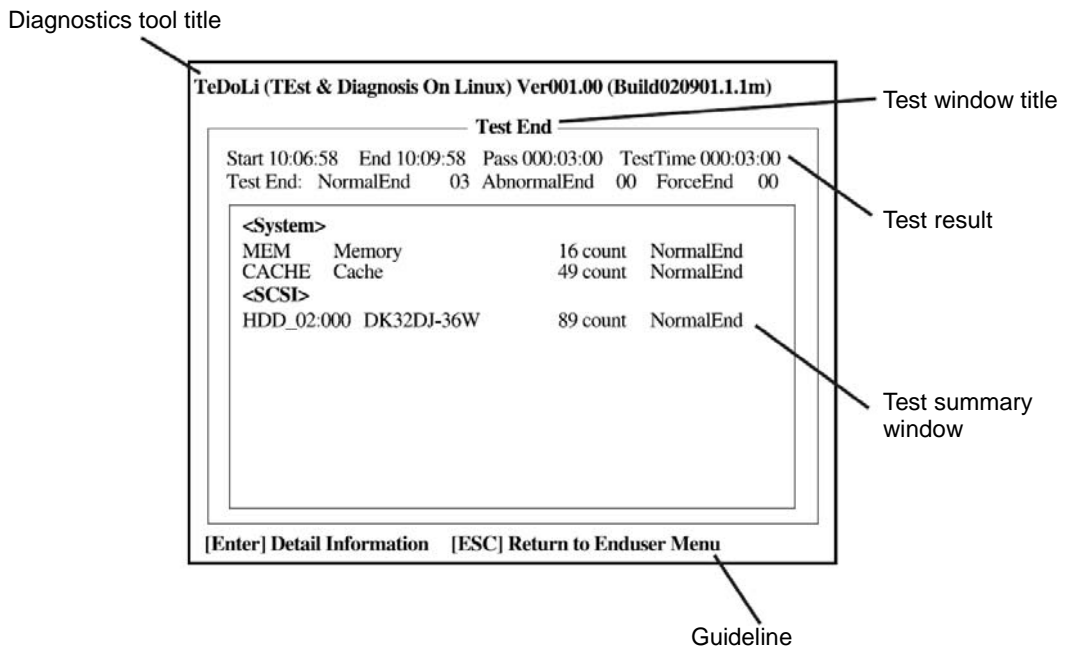
Diagnostics tool title

Shows the name and version of the diagnostic tool.

Test window title

Shows the progress of the diagnostics. "Test End" is displayed when the diagnostics completes.

Test result

Shows the start, end, and elapsed time and completion status of the diagnostics.

Guideline

Shows the details of the keys to operate window.

Test summary window

Shows the results of each test that executed the diagnostics. Move the cursor and press the **Enter** key on the cursor line to display the details of the test.

When an error is detected by the system diagnostics, the relevant test result in the test summary window is highlighted in red, and "Abnormal End" is displayed in the result on the right side.

Move the cursor to the test that detected the error, and press the **Enter** key. Record the error message that has been output to the Detail Information screen and contact your sales agent.

7. Follow the guideline shown at the bottom of the screen, and press the **Esc** key.

The [Enduser Menu] below is displayed.

```
TeDoLi (TEst & Diagnosis On Linux) Ver001.00 (Build020901.1.1m)
                        ┌─ Enduser Menu ─┐
                        │ <Test Result>  │
                        │ <Device List>  │
                        │ <Log Info>     │
                        │ <Option>       │
                        │ <Reboot>       │
  Please choose a function by the arrow key and push Enter key.
```
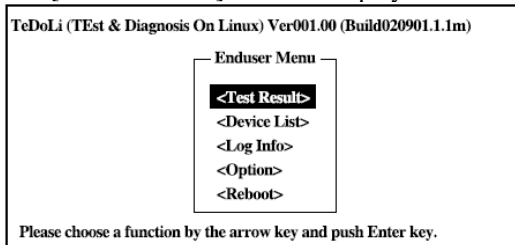
<Test Result>
Shows the diagnostics completion screen of the above diagnostics.

<Device List>
Shows a list of connected devices.

<Log Info>
Shows the log information of the diagnostics. Log information can be saved.
To save it, connect a FAT formatted removable media, and select <Save(F)>..

<Option>
Optional features can be used from this menu.

<Reboot>
Reboots the system.

8. Select <Reboot> in the [Enduser Menu] above.
The server restarts and the system is started from the NEC EXPRESSBUILDER.

9. Exit the NEC EXPRESSBUILDER, and remove the DVD from the optical disk drive.

10. Power off the server and unplug the power cord from the receptacle.

11. Reconnect all the LAN cables that have been disconnected in Step 2 to the server.

12. Plug the power cord.

This completes the system diagnostics.

MAINTENANCE TOOLS

The Maintenance Tools is a tool of this product for preventive maintenance, as well as for trouble analysis and its settings.   Follow the below procedure to start the Maintenance Tool.

Starting the Off-line Maintenance Utility

The Off-line Maintenance Utility may be started in the following ways.

1. Boot peripheral devices at first, then power on the Express server.

2. Load the [EXPRESSBUILDER] DVD into the optical disc drive of the Express server.

3. After loading the DVD, reset (by pressing <Ctl> + <Alt> + <Delete> keys) or power off and on to reboot the Express server.
Following menu appears on the DVD.

Tool Menu:
Select this to launch the Off-line Maintenance Utility.
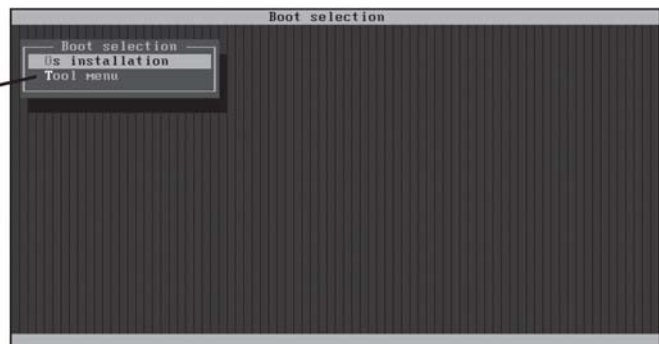
4.   Select [Tool Menu].
Following Language selection menu appears.

Japanese:
Menu is displayed in Japanese
from now

English:
Menu is displayed in English
from now

Return to previous menu:
Boot selection menu is
displayed
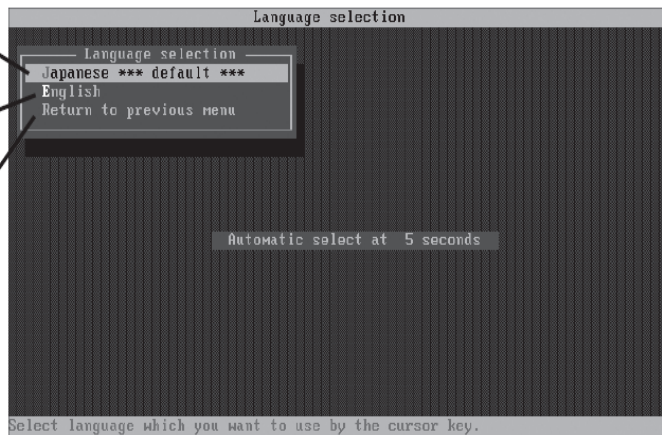
IMPORTANT:

Default menu selection is [Japanese]. When there is no key operation for five second after
Language menu appears, [Japanese] starts automatically.

5.   Select [English]
When [English] is selected, following tool menu appears.

6.   Select one of the tool and start.

Function of Maintenance Tools

The following functions are available in the Maintenance Tools.

■   Maintenance Utility

The Off-line Maintenance Utility is started in "Maintenance Utility." The Off-line Maintenance Utility is an OS-independent maintenance program. When you are unable to start the OS-dependent NEC ESMPRO to troubleshoot a problem, the Off-line Maintenance Utility can be used.

IMPORTANT:

■   The Off-line Maintenance Utility is intended for use of your service representative. The NEC EXPRESSBUILDER DVD contains a file that describes the operation of the utility, but do not attempt to use the utility by yourself. Contact your service representative and follow their instructions.

■   See the on-line help for details for the Off-line Maintenance Utility. For further information, ask your service representative.

The Off-line Maintenance Utility provides the following features.

–   IPMI Information Viewer

Provides the functions to view the system event log (SEL), sensor data record (SDR), and field replaceable unit (FRU) and to make a backup copy of them.

Using this feature, you can find system errors and events to determine a maintenance part.

–   BIOS Setup Viewer

Provides the functions to export the current configuration data defined with the SETUP utility to a text file.

–   System Information Viewer

Provides the functions to view and information on the processor (CPU) and on the BIOS. You can export the information to a text file.

–   System Information Management

Provides the function to make a back-up copy of your data.

Without the backup data, the system-specific information and/or configuration may not be restored.

Only the authorized service maintenance staff is allowed to restore the backup data.

– System Management

The parameters of BMC (Baseboard management Controller) are set for remote control and alert.

■ BIOS/FW Updating

This menu allows you to update the software module such as BIOS and firmware of the server by using the update disk (3.5-inch floppy disk) that is distributed from NEC customer service representative.

After rebooting the system, an update program is started automatically from floppy disk, and the various BIOS and firmware programs are updated.

IMPORTANT:

Do not turn off the server while the update program is running. If the update processing is discontinued, the system becomes unable to start.

■ ROM-DOS startup FD
Create a support disk for starting the ROM-DOS system.

■ Test and diagnostics
Execute various tests on the server system to check if the server functions are normal and if the connection between the server and additional board is normal.

After the Test and diagnostics is executed, a system check program assigned to each model starts.

■ System Management
The parameters of BMC (Baseboard Management Controller) are set for remote control and alert.

This menu's function is the same as the "System Management" of the "Maintenance Utility."

RELOCATING/STORING THE NEC EXPRESS5800/FT SERIES

Follow the procedure below to relocate or store the server.

⚠ CAUTION

Observe the following instructions to use the server safely. There are risks of fire, personal injury, or property damage. See "PRECAUTIONS FOR SAFETY" in Chapter 1 for details.

- Never attempt to lift the server only by yourself.
- Do not install the server in any place other than specified.
- Do not connect/disconnect any interface cable with the power cord of the server plugged to a power source.

IMPORTANT:

- If the server needs to be relocated/stored due to a change in the floor layout to a great extent, contact the sales agent.

- Make sure to make a backup copy of your valuable data in the hard disk, if any.

- When moving the server with hard disks, make sure not to give a shock to the hard disks.

- When storing the server, keep it under storing environment conditions (temperature: -10 to 55°C, humidity: 20 to 80%, non-condensing).

---

1. Take a floppy disk and a DVD out of the server, if any.

2. Power off the server.

3. Unplug the power cord of the server from a power outlet.

4. Remove all the cables from the server.

5. Remove all the mounted CPU/IO modules.

6. Remove the 4U chassis and the rails from the rack cabinet.

7. Carry 4U chassis and CPU/IO modules separately.

8. Protect the server with the shock-absorbing materials, and pack it securely.

IMPORTANT:

Check and adjust the system clock before operating the server again after relocating or storing it.

If the server and the built-in optional devices are moved from a cold place to a warm place in a short time, condensation will occur and cause malfunctions and breakdown when these are used in such state. When you start operating these equipments again after the transportation or the storage, make sure to wait for a sufficient period of time to use them in the operating environment.

If the system clock goes out of alignment remarkably as time goes by, though the system clock adjustment is performed, contact your sales agent.

Chapter 7

Troubleshooting

This section covers some of the issues that can occur with this server, and provides the trouble shooting steps you can refer to.

TO LOCATE THE ERRORS

Use NEC ESMPRO to monitor the occurrence of fault during the system operation.

Especially take note on whether any alert is reported to NEC ESMPRO Manager on the management PC. Check whether any alert is reported on the Operation Window, DataViewer, or Alert Viewer of NEC ESMPRO Manager.

[Example]
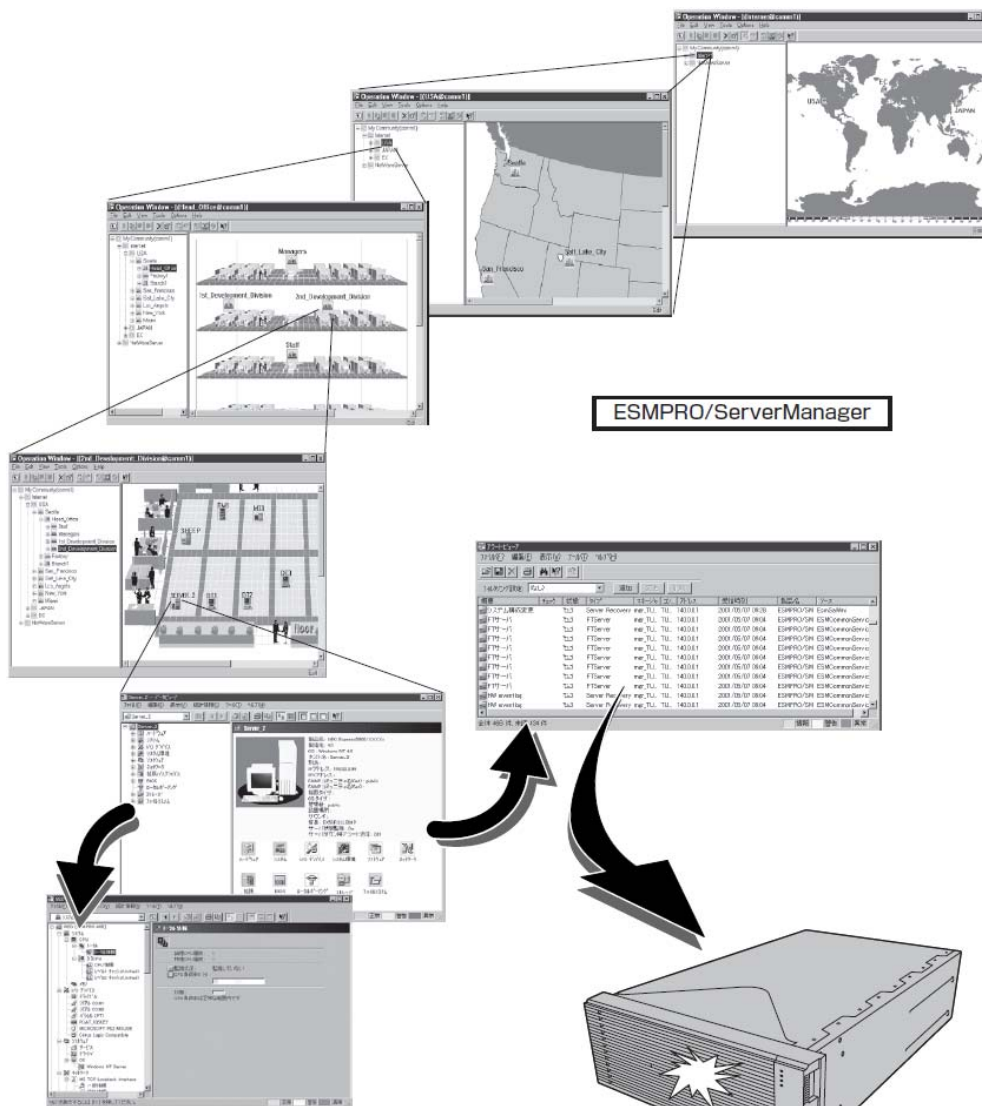
Confirm failed points and failure
contents of Server/Workstation

ERROR MESSAGES

If the NEC Express5800/ft series enters the abnormal state, the error is posted by various means. This section explains the types of error messages.

Error Messages by LED Indication

The LEDs on the front and rear panels of the NEC Express5800/ft series and near the handles of hard disks inform the user of the various server statuses by the colors and the patterns of going on, going off, and flashing. If trouble seems to have occurred, check the LED indication. For the LED indication and meanings, see page 2–16 "EXPRESSSCOPE."

This User's Guide describes actions to be taken for watch error message. However, if replacement of modules is necessary, contact your sales agent.

POST Error Messages

Powering on the server automatically starts the self-diagnostic program, POST (Power On Self-Test). When POST detects any error, it displays an error message and its measure on the display unit. Follow the table below to troubleshoot such errors.

```
Phoenix BIOS 4.0 Release 6.0.XXXX
              :
CPU=Pentium III XXX MHz
0640K System RAM Passed
0127M Extended RAM Passed
WARNING:
02B0: Diskette drive A error.
              :
press <F1> to resume, <F2> to SETUP
```
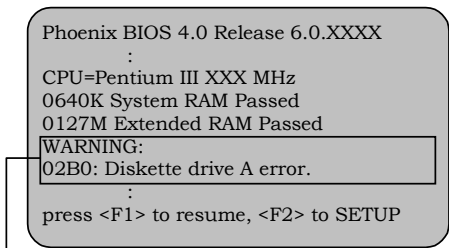
Message indicating a floppy disk drive error

TIPS:

For error messages on optional PCI boards, refer to the manual provided with those options.

On-screen error message	Cause	Action
0200 Failure Fixed Disk	• HDD is faulty • CPU/IO module is faulty.	• Replace the HDD. • Replace the CPU/IO module.
0210 Stuck Key	Keyboard connection error	• Disconnect the keyboard and connect it back again. • Replace the keyboard.
0211 Keyboard error	Keyboard is faulty.	• Disconnect the keyboard and connect it back again. • Replace the keyboard. • If restarting does not help, replace the CPU/IO module.
0212 Keyboard Controller Failed	Keyboard controller is faulty.	If restarting the server does not help, replace the CPU/IO module.
0213 Keyboard locked - Unlock key switch	Keyboard is locked.	Unlock the key switch.
0230 System RAM Failed at offset	DIMM is faulty.	• Replace DIMM. • Replace the CPU/IO module.
0231 Shadow RAM Failed at offset	Shadow RAM is faulty.	• Replace DIMM. • Replace the CPU/IO module.
0232 Extended RAM Failed at address line	Extended RAM is faulty.	• Replace DIMM. • Replace the CPU/IO module.
0233 Memory type mixing detected	Memory of the different types is installed.	Memory of the different types is installed. Replace DIMM with appropriate one.
0250 System battery is dead -Replace and run SETUP	System battery is dead.	• Replace system battery. • Replace CPU/IO module.
0251 System CMOS checksum bad-Default configuration used	System CMOS configuration is changed.	Reconfigure the system CMOS by using BIOS setup.

On-screen error message	Cause	Action
0252 Password checksum bad -Password cleared	Password is cleared.	Reconfigure by using BIOS setup.
0260 System Timer error	System Timer is faulty.	Reconfigure by using BIOS setup. If the error cannot be solved after this, replace the CPU/IO module.
0270 Real time clock error	RTC is faulty.	
0271 Check date and time setting	Date and time are incorrectly set.	
02D0 System cache error - Cache disabled	CPU cache is faulty.	If replacing the CPU does not help, replace the CPU/IO module.
02D1 System Memory exceeds the CPU's caching limit	CPU cache is faulty.	
02F0 CPU ID	CPU is faulty	
0613 COM A configuration change	COM A configuration is faulty.	If restarting does not help after resetting the setting to default by using BIOS setup, replace the CPU/IO module.
0614 COM A config, error - device disable	Device constructing COM A is faulty.	
0615 COM B configuration change	COM B configuration is faulty.	
0616 COM B config, error - device disable	Device constructing COM A is faulty.	
0B28 Unsupported Processor detected on Processor 1	Unsupported CPU is mounted.	Check the supported CPU and replace it. If this does not help, replace the CPU/IO module.
0B29 Unsupported Processor detected on Processor 2	Unsupported CPU is mounted.	
0B80 BMC Memory Test Failed	RMC device is faulty.	Replace the CPU/IO module.
0B81 BMC Firmware Code Area CRC check failed		
0B82 BMC core Hardware failure		
0B83 BMC IBF or OBF check failed	RMC device is faulty.	Replace the CPU/IO module.
0B8B BMC progress check timeout	BMC check is suspended.	Replace the CPU/IO module.
0B8C BMC command access failed	BMC command access failed.	Replace the CPU/IO module.
0B90 BMC Platform Information Area corrupted	BMC device is faulty.	Replace the CPU/IO module.
0B91 BMC update firmware corrupted		
0B92 Internal Use Area of BMC FRU corrupted	Data within SROM is faulty.	Replace the system backboard.
0B93 BMC SDR Repository empty	SDR data is faulty.	If updating SDR does not help, replace the CPU/IO module.
0B94 IPMB signal lines do not respond	SMC is faulty.	Replace the CPU/IO module or a system backboard after determining where IPMB error has occurred based on OS information.
0B95 BMC FRU device failure	NVRAM within BMC is faulty.	Replace the CPU/IO module.

On-screen error message	Cause	Action
0B96 BMC SDR Repository failure	SDR repository within BMC is faulty.	Replace the CPU/IO module.
0B97 BMC SEL device failure	SEL repository within BMC is faulty.	
0B98 BMC RAM test error	BMC RAM is faulty.	
0B99 BMC Fatal hardware error	BMC FPGA is faulty.	
0B9A BMC not responding	BMC device is faulty.	
0B9B Private I2C bus not responding	I2C bus is faulty.	If turning AC power off and on does not help, replace the CPU/IO module or the system backboard.
0B9C BMC internal exception	BMC device is faulty.	Replace the CPU/IO module
0B9D BMC A/D timeout error		
0B9E SDR repository corrupt	SDR data is faulty.	If updating SDR does not solve the issue, replace the CPU/IO module.
0B9F SEL corrupt	SEL repository within BMC is faulty.	Replace the CPU/IO module
0BA0 SDR/PIA mismatched. SDR, PIA must be updated.	SDR and PIA data do not match.	If updating SDR/PIA does not solve the issue, replace the CPU/IO module.
0BB0 SMBIOS - SROM data read error	• I2C bus is faulty. • SROM is faulty. • BMC is faulty.	If turning AC power off and on does not help, replace the system backboard.
0BB1 SMBIOS - SROM data checksum bad	Data within SROM is faulty.	
0BC0 POST detected startup failure of 1st Processor	CPU is faulty.	Replace the CPU.
0BC1 POST detected startup failure of 2nd Processor		
8100 Memory Error detected in DIMM group #1	DIMM is faulty.	Replace DIMM slot 1 and 2.
8101 Memory Error detected in DIMM group #2		Replace DIMM slot 3 and 4.
8102 Memory Error detected in DIMM group #3		Replace DIMM slot 5 and 6.
8103 Memory Error detected in DIMM group #4		Replace DIMM slot 7 and 8.
8104 Memory Error detected in DIMM group #5		Replace DIMM slot 9 and 10.
8105 Memory Error detected in DIMM group #6		Replace DIMM slot 11 and 12.
8120 Unsupported DIMM detected in DIMM group #1	Non-supported DIMM is mounted.	Check the supported DIMM and replace the DIMM. If replacing the DIMM does not help, replace CPU/IO module.
8121 Unsupported DIMM detected in DIMM group #2		

On-screen error message	Cause	Action
8122 Unsupported DIMM detected in DIMM group #3	Non-supported DIMM is mounted.	Check the supported DIMM and replace the DIMM. If replacing the DIMM does not help, replace CPU/IO module.
8123 Unsupported DIMM detected in DIMM group #4		
8124 Unsupported DIMM detected in DIMM group #5		
8125 Unsupported DIMM detected in DIMM group #6		
8130 Mismatch DIMM detected in DIMM group #1	DIMM types do not match.	
8131 Mismatch DIMM detected in DIMM group #2		
8132 Mismatch DIMM detected in DIMM group #3		
8133 Mismatch DIMM detected in DIMM group #4		
8134 Mismatch DIMM detected in DIMM group #5		
8135 Mismatch DIMM detected in DIMM group #6		
8150 NVRAM Cleared By Jumper	CMOS clear jumper is mounted.	Turn off the DC power and change the jumper setting back.
8151 Password Cleared By Jumper	Password clear jumper is mounted.	
8160 Mismatch Processor Speed detected on Processor 1	CPU frequency does not match.	Check supported CPUs and replace them. If replacing the CPU does not help, replace CPU/IO module.
8161 Mismatch Processor Speed detected on Processor 2		
9000	A serious error occurred during a POST.	There are some error messages in addition to this error code. Check the other error message.
9002 Memory not installed.	DIMM is not implemented. DIMM is faulty.	Mount or replace the DIMM.
9003 Memory implementation error detected	Error is detected on memory implementation.	Check supported DIMMs and replace the DIMM. If replacing the DIMM does not help, replace the CPU/IO module.

On-screen error message	Cause	Action
9006 HW Memory Test failed.	Memory is faulty.	Replace the DIMM. If replacing it does not help, replace the CPU/IO module.
9064 Mixed CPU Steppings detected.	Different CPU steppings are found.	Check supported CPUs and replace them. If replacing the CPU does not help, replace CPU/IO module.
9090-9097	A memory error has occurred, or memory is faulty.	(a) Verify that the memory is mounted properly. (b) Replace the memory. If this does not help, replace the module.

Server Management Application Error Message

If the server management tool such as NEC ESMPRO Agent or NEC ESMPRO Manager has been installed in the NEC Express5800/ft series or management PC, you can obtain the error information from the display unit of the server or management PC.

See Chapter 5 or online documentation for details of such application programs.
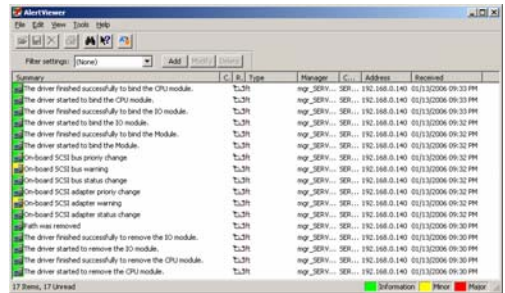
TROUBLE SHOOTING

When the server fails to operate as expected, see the following to find out your problem and follow the given instruction before asking for repair.

If the server still fails to operate successfully after solving your problem, take a note of the on-screen message and contact your sales agent.

Problems with NEC Express5800/ft series

Fail to power on the server:

□   Is the server properly supplied with power?
  → Check if the power cord is connected to a power outlet (or UPS) that meets the power specifications for the server.

  → Check if the two pieces of the provided power cord are connected to the main unit properly.

  → Make sure to use the power cord provided with the server. Check the power cord for broken shield or bent plugs.

  → Make sure the power breaker for the connected power outlet is on.

  → If the power cord is plugged to a UPS, make sure the UPS is powered and it supplies power. See the manual that comes with the UPS for details.

   Power supply to the server may be linked with the connected UPS using the BIOS setup utility of the server.

   <Menu to check: [Server] - [AC-LINK] - [Power On]>

  → Make sure the POWER switch on the power unit is on.

□   Did you press the POWER switch?
  → Press the POWER switch on the front of the NEC Express5800/ft series to turn on the power (the POWER LED lights).

□   Did you install the CPU/IO module properly?
  → Check if the CPU/IO module is properly installed in the server. Secure the CPU/IO module with screw located on the module removable handle.

□   Check if one of the status lamp of CPU/IO module is on.
  → Make sure to take out and put in the CPU/IO module again with the power off, then power on the server again.

POST fails to complete:

☐   Is the DIMM properly installed?
  → At least one pair of DIMM(2 DIMMs) is required for operation.

☐   Is the memory size large?
  → The memory check may take a time if the mounted memory size is large. Wait for a while.

☐   Did you perform any keyboard or mouse operation immediately after you started the server?
  → If you perform any keyboard or mouse operation immediately after start-up, POST may accidentally detect a keyboard controller error and stops proceeding. In such a case, restart the server once again. Do not perform any keyboard or mouse operation until the BIOS start-up message appears when you restart the server.

☐   Does the server have appropriate memory boards or PCI card?
  → Operation of the server with unauthorized devices is not guaranteed.

☐   Are the System BIOS and Emulex BIOS of the server configured?
  → The parameter differs from the factory default. Make settings by the System BIOS setup Utility and Emulex BIOS configuration Utility. For details, see Chapter4 of User's Guide (Setup).

Server reboots while running the SAS Configuration utility:

☐   Have you modified the Setup settings?
  → From [Server] - [Monitoring Configuration] - [Option ROM Scan Monitoring] of Setup, select "Disabled." If [Option ROM Scan Monitoring] is enabled, the system may reboot while using the SAS Configuration utility. Change back the setting after you finish using the utility.

Fail to access to external devices:

☐   Are cables properly connected?
  → Make sure that the interface cables and power cord are properly connected. Also make sure that the cables are connected in the correct order.

☐   Is that device compliant with NEC Express5800/ft series?
  → Operation of the server with unauthorized devices is not guaranteed.

☐   Is the power-on order correct?
  → When the server has any external devices connected, power on the external devices first, and then the server.

☐   Did you install drivers for connected optional devices?
  → Some optional devices require specific device drivers. Refer to the manual that comes with the device to install its driver. Make correct settings by the System BIOS setup Utility and Emulex BIOS configuration Utility. For details, see Chapter4 of User's Guide (Setup).

CPUs not in Duplex mode:

> → Check if the memory configuration is correct.
>
> → Check if third-party CPUs or memory (DIMM) are used.

System not in Duplex mode for difference BIOS of CPU/IO modules:

> ☐ Is the setting in [ft server utility]-[-system configuration]-[firmware update] enabled?
>> → After building CPU/IO modules into this server again in the above setting, this system becomes duplex mode on updating new bios.

Disks not in Duplex mode:

> → Unless you perform mirroring (including reconfiguration after failed disks are replaced) in correct order, the mirror may not be (re)configured. Check if the steps were correct.

The keyboard or mouse fails to operate:

> ☐ Is the cable properly connected?
>> → Make sure that the cable is connected to the correct connector on the rear of the server.

> ☐ Are the keyboard and mouse are compliant with NEC Express5800/ft series?
>> → Operation of the server with unauthorized devices is not guaranteed.

Screen freezes, keyboard and mouse don't work:

> → If the amount of memory becomes larger, it takes time to copy the memory in duplex mode and the system stops working temporarily during the copying, but it is not system trouble.

Fail to access (read or write) to the floppy disk:

> ☐ Check if you are not using on the service console of ESX4.
>> → ESX4 does not support USB floppy disk drives.

> ☐ Is the floppy disk properly set in the drive?
>> → Insert the disk into the floppy disk drive till the drive clicks.

> ☐ Is the floppy disk write-protected?
>> → Place the write-protect switch on the floppy disk to the "Write-enabled" position.

> ☐ Is the floppy disk formatted?
>> → Use a formatted floppy disk or format the floppy disk in the floppy disk drive. Refer to the manual that comes with the OS for formatting a floppy disk.

Fail to access to the optical disk:

☐   Is the optical disk properly set in the DVD drive tray?
→ The tray has a holder for the optical disk. Make sure that the optical disk is placed properly on the holder.

☐   Check if ft control software is not installed.
→ After ft control software is installed, an optical disk drive becomes inaccessible. When accessing to an optical disk drive is necessary, follow the procedure below to temporarily allow access to the drive.

/opt/ft/sbin/enable-usb-storage

Use of optical disk drive in normal operation is not recommended. Do not operate the server while using the optical disk drive, such as mounting on service console or allocating to guest OS.

When an optical disk drive is used during the system operation, the product may not work properly. If an optical disk drive is used, remove the mounted / allocating optical disk drive and reboot the system.

☐   Is the optical disk applicable to the server?
→ The optical disk for Macintosh is not available for use.

Fail to access the storage:

☐   Is the storage applicable to the server?
→ Operation of any device that is not authorized by NEC is not guaranteed.

☐   Is the storage properly installed?
→ Make sure to check the storage is completely connected.

Fail to start the OS:

☐   Is a floppy disk in the floppy disk drive?
→ Take out the floppy disk and restart the server.

☐   Is the NEC EXPRESSBUILDER DVD in the optical disk drive?
→ Take out the NEC EXPRESSBUILDER DVD and restart the server.

The server is not found on the network:

☐   Is the LAN cable connected?

→ Make sure to connect the LAN cable to the network port on the rear of the server. Also make sure to use the LAN cable that conforms to the network interface standard.

☐   Have the protocol and services already setup?

→ Install the distinctive network driver for the server. Make sure that the protocol, such as TCP/IP, and services are properly specified.

☐   Is the transfer speed correct?

→ The built-in LAN controller mounted as standard on this server can be used in network with the transfer speed of 1000Mbps, 100Mbps or 10Mbps. You can change the transfer speed or configure the setting from OS. However, do not use the "Auto Detect" function. Fix the setting of the transfer rate to the same with that of the connected hub. Also, check if the duplex mode is the same with that of the connected hub.

Machine repeats rebooting at startup:

☐   Isn't the OS boot monitoring function enabled for reset?

→ When you are using the NEC Express5800/ft series, the OS boot monitoring function must be disabled in the following cases. For information on disabling the OS boot monitoring, see "Step 4 Invalidate OS Boot Monitoring function" in *User's Guide (Setup)*.

- When execuing the maintenance such as system update.:
- When any daemon or drive does not work correctly due to a failure or error:
*For the device configuration with large memory or disk volume, it is recommended to change the default BIOS setup 10 minutes to an appropriate value.

☐   Is the value of [OS Boot Monitoring] in the BIOS setting appropriate?

→ Change the value of [OS Boot Monitoring] to suit your environment. (For details, see page 4-28 "Monitoring Configuration.")

Memory dump (debug information) cannot be collected when a failure occurs:

☐   Do you press the DUMP switch correctly?

→ Hold down the DUMP switch for 3 to 8 seconds if you would like to collect memory dump by pressing the switch. If you press DUMP switch less than 3 seconds or more than 8 seconds, you will not be able to collect memory dump.

☐   Check if you are not using a physical processor of CPU #0 for the virtual machine.

→ If a physical processor of CPU #0 is allowed to be used for the virtual machine, memory dump may not be collected even when pressing the DUMP switch. To operate the machine assuming to collect memory dump, set the value other than "0" for the property of "Scheduling Affinity" of the virtual machine.

∗ Setting procedure for "Scheduling Affinity"
Select the target virtual machine from vSphere Client and select "Edit" from CPU information on the "Resource Allocation" page. On the displayed property screen, select "Advanced CPU" on the "Resource" page to change "Scheduling Affinity".

A CPU/IO module cannot be integrated:

→   When reinstallation is done due to a failure in a component, the reinstallation may stop with the below message recorded in a log file. If this occurs, MTBF of the component does not reach the threshold and the reinstallation cannot be performed as it is determined that repair is needed. Typically, device replacement is required. Contact your maintenance service engineer. If the integration needs to be done with the current devices, you can forcibly reinstall the currenlty used device through consultation with the maintenance service engineer.

kernel: EVLOG: ERROR - x is now STATE_BROKEN / REASON_BELOW_MTBF
  (x is a device number)

Wake On LAN does not function:

→   Wake On LAN environment is unavailable on ESX4.0.

Not Automatically reported in rebooting after the system shutdown:

→   The report-function which is notify to administrator in rebooting after the system shutdown is not supported on this server.

Unable to recognize the server from a managing PC:

□   Did you configure [Initialize Remote Management Card]?
→Start the server-accessory NEC EXPRESSBUILDER, then go to [Tools] - [Initialize Remote Management Card] to write each server information in order to initialize the card.

□   Does your management PC contain Java2 RuntimeEnvironment, Standard Edition 1.4.2_04 or later?
→Java2 RuntimeEnvironment, Standard Edition 1.4.2_04 or later is required. Use the following procedure to install.

Start Windows on a management PC that you want to install the Java, then insert the EXPRESSBUILDER DVD into the DVD-ROM drive. Windows automatically launches the Autorun menu.

Click [Software Setup] - [DianaScope]. Run the JRE installer in the DianaScope installation menu.
  # If you would like to install the latest Java Runtime, go to the following website to download:

http://java.sun.com/j2se/

However, as JRE6 and later are not supported, they cannot be used.

☐   Do you connect LAN cable appropriately?

→Check if LAN cable is connected appropriately. The server sensors work properly only when the cable is connected properly. Make sure the cable isn't mistakenly connected to the server's LAN connector or to the serial port connector.

☐   Check if IP address is duplicated?

→IP address for the management LAN port is configured as 192.168.1.1 at the factory default setting. Change the IP address if this one is already used on the network, as this one isn't recognized appropriately.

☐   Is network connection restricted by the firewall or the gateway?

→ Network connection may be restricted by a firewall setting. See if you can solve the problem by connecting the server and a client PC directly with a cross cable. Refer to "ExpressScope Engine2" User's Guide of NEC EXPRESS BUILDER which is appended to this server , then check the port of the Remote Management Card and set the firewall or the gateway.

Server console screen does not appear on the web Remote KVM console screen:

☐   Did you set the server's screen resolution properly?

→ When you display the server screen by using the remote KVM in the Remote Management function, set the screen resolution 1024 x 768 and the refresh rate should be less than 75Hz.

Problems with NEC EXPRESSBUILDER

When the server is not booted from the NEC EXPRESSBUILDER DVD, check the following:

- ☐ Did you set the NEC EXPRESSBUILDER DVD during POST and restart the server?
  - → If you set the NEC EXPRESSBUILDER DVD during POST but do not restart the server, an error message will appear or the OS will boot.

- ☐ Is BIOS configuration correct?
  - → The boot device order may be specified with the BIOS setup utility of the server. Use the BIOS setup utility to change the boot device order to boot the system from the optical disk drive drive first.
    <Menu to check: [Boot]>

- ☐ Is the connected Flash FDD or inserted floppy disk formatted?
  - → Make sure that the Windows recognizes that the connected Flash FDD or inserted floppy disk is formatted. If not, format it.

When an error occurs while the NEC EXPRESSBUILDER is in progress, the following message appears. After this message appears, record the error code and contact to the maintenance service company.

Message	Cause and Remedy
This machine is not supported.	This EXPRESSBUILDER version cannot be used for this server. Execute the NEC EXPRESSBUILDER on the compliant server.
NvRAM access error	Cannot access to the nonvolatile memory (NvRAM).
Hard disk access error	The hard disk is not connected or it is faulty. Check whether the hard disk is correctly connected.
The system-specific information does not exist on the baseboard. Please restore the backup data or write the data by using [System Information Management] of the Off-line Maintenance Utility. Only the authorized personnel are allowed to do this operation.	This message is displayed when NEC EXPRESSBUILDER cannot find device specific information due to the replacement of a motherboard, etc. Maintenance personnel write information using offline maintenance utility.

In other cases, the error message also appears when a failure is detected while executing the Test and Diagnostics. Check the error message and contanct to the maintenance service company.

Problems with NEC ESMPRO

NEC ESMPRO Manager

→ See page 5-4 and the later in "Chapter 5 Procedures after Completion of Installation". See also online document in NEC EXPRESSBUILDER DVD-ROM for troubleshooting and other supplementary information.

NEC ESMPRO Agent

→ See page 5-3 and the later in "Chapter 5 Procedures after Completion of Installation". Also see User's Guide in NEC ESMPRO/Agent for VMware CD-ROM.

doc/esmsa_users.pdf

COLLECTION OF TROUBLE LOGS

If a failure occurs, you can collect information at the time of failure occurrence by the following ways.

> **IMPORTANT:**
>
> - Collect failure information that is described later only when you are asked to do so by a maintenance service engineer of the maintenance service company.
>
> - You may see a message telling you the virtual memory is not sufficient in a reboot following a failure. Continue to start up the system. If you perform reset and attempt to restart again, collecting failure information fails.

Collection of System Information

The ESX system information is recorded in syslog, etc. When you collect system information in the NEC Express5800/ft series, log in as the root user and run the following command.

/opt/ft/sbin/buggrabber.pl

The collected data is created in the following directory.

/home/BugPool/

Collection of ESMPRO Agent

When you collect NEC ESMPRO Agent log in the NEC Express5800/ft series, log in as the root user and run the following command.

cd /opt/nec/esmpro_sa/tools/

./collect.sh

The collected data is created in the following file.

/opt/nec/esmpro_sa/tools/collectsa.tgz

COLLECTIng THE MEMORY DUMP

If a failure occurs, the memory data should be dumped to acquire the required information.

IMPORTANT:

- Consult with your sales agent before dumping the memory. Executing memory dumping while the server is in the normal operation may affect the system operation.

- Restarting the system due to an error may display a message indicating insufficient virtual memory. Ignore this message and proceed. Restarting the system again may result in dumping improper data.

- Press the DUMP switch on the primary CPU/IO module, whose POWER LED has been blinking, for three to eight seconds. Use something sharp, such as curved clips to press the DUMP switch on CPU/IO module 1.

- If a physical processor of CPU #0 is allowed to be used for the virtual machine, memory dump may not be collected even when pressing the DUMP switch. To operate the machine assuming to collect memory dump, set the value other than "0" for the property of "Scheduling Affinity" of the virtual machine.

Preparing to collect Memory Dump

Memory dumping with the DUMP switch may disable the server to restart. In such a case, it is required to force the server to shut down.

Saving Dump Files

Press the DUMP (NMI) switch on the primary CPU/IO module to save the dump file when an error occurs. Insert something sharp-pointed like a pen into the switch hole to press the DUMP switch.

Pressing the DUMP switch saves the dump file in the specified directory. (Memory dumping may not be available when the CPU stalls.)

DUMP (NMI) switch
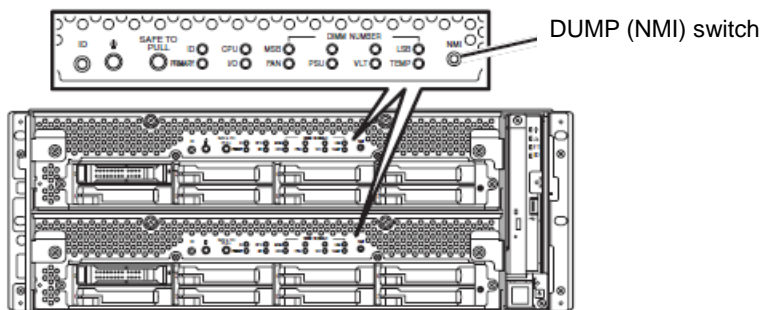
IMPORTANT: Do not use a toothpick or plastic stick that is easy to break.

Chapter 8

System Upgrade

This chapter describes procedures to add options and replace failed components.

IMPORTANT:

- Optional devices described in this chapter should not be installed or removed by the user. NEC does not assume any liability for damage to optional devices or the server or malfunctions of the server resulted from installation by the user.

- Be sure to use only optional devices and cables designated by NEC. Repair of the server due to malfunctions, failures, or damage resulted from installing undesignated devices or cables will be charged.

SAFETY PRECAUTIONS

Observe the following notes to install or remove optional devices safely and properly.

⚠ WARNING
Observe the following instructions to use the server safely. There are risks of death or serious personal injury. See "PRECAUTIONS FOR SAFETY" in Chapter 1 for details.   • Do not disassemble, repair, or alter the server.   • Do not look into the DVD-ROM drive.   • Do not remove the lithium battery.   • Disconnect the power plug before working with the server.

⚠ CAUTION
Observe the following instructions to use the server safely. There are risks of fire, personal injury, or property damage. See "PRECAUTIONS FOR SAFETY" in Chapter 1 for details.   • Do not install or remove components by a single person.   • Do not install the server leaving the cover removed.   • Make sure to complete component installation.   • Do not pinch your finger(s).   • High temperature

ANTI-STATIC MEASURES

The server contains electronic components sensitive to static electricity. Avoid failures caused by static electricity when installing or removing any optional devices.

- Wear wrist straps (arm belts or anti-static gloves).

  Wear wrist straps on your wrists. If no wrist strap is available, touch an unpainted metal part of the cabinet before touching a component to discharge static electricity from your body.

  Touch the metal part regularly when working with components to discharge static electricity.

- Select a suitable workspace.

  – Work with the server on the anti-static or concrete floor.

  – When you work with the server on a carpet where static electricity is likely to be generated, make sure take anti-static measures beforehand.

- Use a worktable.

  Place the server on an anti-static mat to work with it.

- Clothes

  – Do not wear a wool or synthetic cloth to work with the server.

  – Wear anti-static shoes to work with the server.

  – Take off any metal accessories you wear (ring, bracelet, or wristwatch) before working with the server.

- Handling of components

  – Keep any component in an anti-static bag until you actually install it to the server.

  – Hold a component by its edge to avoid touching any terminals or parts.

  – To store or carry any component, place it in an anti-static bag.

PRE-UPGRADE VERIFICATION

If you add on optional devices onto this equipment, some devices require specific ft server control software version (s).

If the optional asks for specific version number (s), refer to the following procedure before adding on the devices.

1. Confirm the required ft server control software's version, Refer to the sever-accessory User's Guide, check the NEC website, or contact your sales representative.

2. Verify the version of the ft server control software on your system.

3. After confirming it as the available version, add the device onto the server.

For more information on how to verify the version of the ft server control software, refer to the separate User's Guide (setup) "Confirming the ft Server Control Software Version".

PREPARING YOUR SYSTEM FOR UPGRADE

Note the following, when installing or replacing devices, to improve the performance of NEC Express5800/ft series.

- With the NEC Express5800/ft series, devices can be replaced during the continuous operation. Take extreme care for electric shock and damage to the component due to short-circuit.

- Optional devices cannot be installed or removed during continuous operation. After shutting down OS, check that the server is powered off, disconnect all power cords and interface cables from the server before installing or removing the optional devices.

- To remove the CPU/IO module during the continuous operation, disable the intended module (place the module off-line) by using the ftsmaint command. After a new module is installed to the server, enable the module using the ftsmaint command.

  > **TIPS:**
  >
  > The system is defaulted to automatically boot the module, once installed. For more information, see Chapter 5.

- Make sure to provide the same hardware configuration on both CPU/IO modules.

- Use the same slots and sockets on both groups.

- Do not install those devices having different specifications, performance, or features.

- Before removing the set screws from the CPU/IO modules, place the desired module off-line using the ftsmaint.

2.5-INCH HARD DISK DRIVE

The 2.5-inch hard disk drive bays in front of the server can mount up to 16 hard disk drives with the 2.5 inch width exclusive trays.

IMPORTANT:

Do not use any hard disks that are not authorized by NEC. Installing a third-party hard disk may cause a failure of the server as well as the hard disk. Purchase hard disks of the same model in pair. Contact your sales agent for hard disk drives optimum for your server.

The operation is executed on the created mirror volume with installed hard disk drive pairs such as slot 0 on CPU/IO module 0/1, slot 1 on CPU/IO module 0/1, slot 2 on CPU/IO module 0/1. (The OS is installed on the mirror volumes that consist of the hard disks in the slot 0.)

Slots to execute the mirroring process
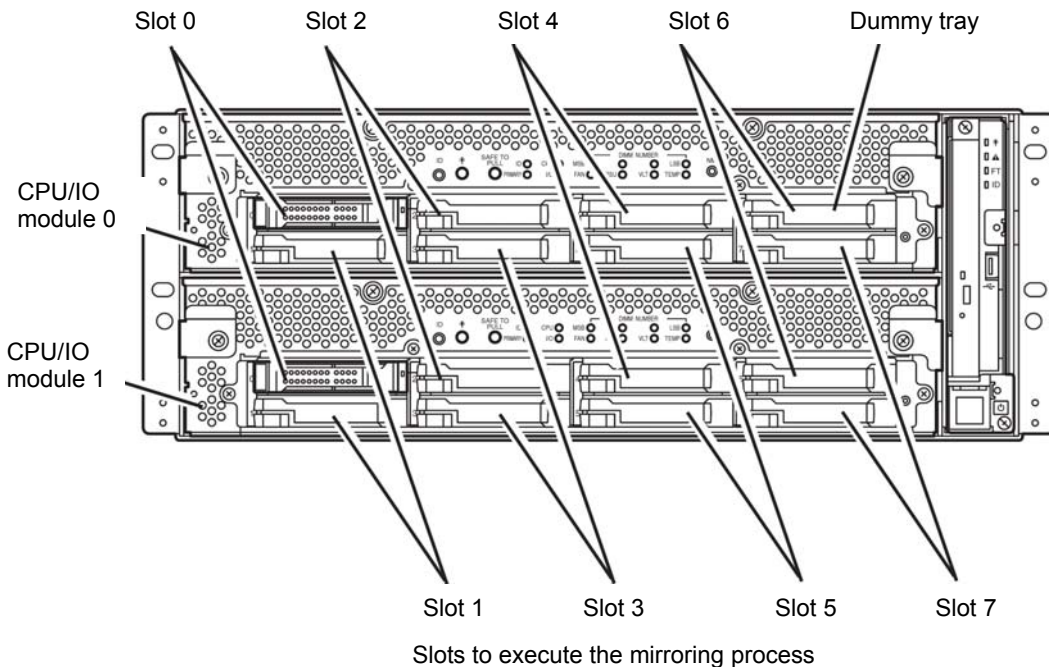
Empty slots in the 2.5-inch hard disk drive bay contain dummy trays. The dummy trays are inserted to improve the cooling effect within the device. Always insert the dummy trays in the slots with no hard disks drive installed.

Installing 2.5-inch Hard Disk Drive

Follow the procedure below to install the hard disks. Install the hard disks from a smaller slot number to large number on CPU/IO module 0/1, from slot 0 to slot through slot 7.

> **IMPORTANT:**
>
> - Refer to "ANTI-STATIC MEASURES" and "PREPARING YOUR SYSTEM FOR UPGRADE" before starting installing or removing options.
>
> - You must mount two HDDs that form dual disk configuration before starting the OS.

1. Shut down the OS. The system turns off automatically.

2. Remove the front bezel.

3. Identify the slot to which you want to install a hard disk drive.

4. If a dummy tray is inserted in a slot you want to install the hard disk drive, remove the dummy tray.

> **IMPORTANT:**
>
> Keep and store the dummy tray with care.
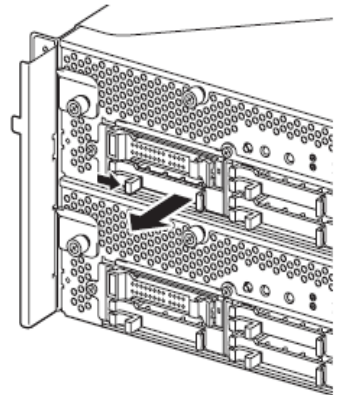
5. Unlock the hard disk drive.
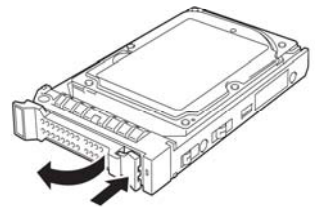
6. Firmly hold the handle of the hard disk drive to install and insert the drive into the slot.

> ### TIPS:
>
> - Insert the disk until the lever hook touches the server frame.
>
> - Check the direction of the lever. Insert the hard disk with the lever unlocked.
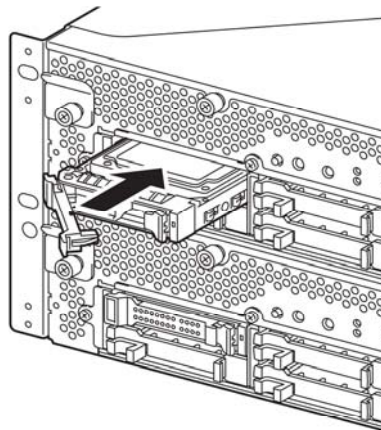
7. Slowly close the lever. When the lever is locked, you will hear a click sound.

> ### IMPORTANT:
>
> Be careful not to pinch your finger(s) between the lever and handle.

> ### TIPS:
>
> Check the hook of the lever is engaged with the frame.
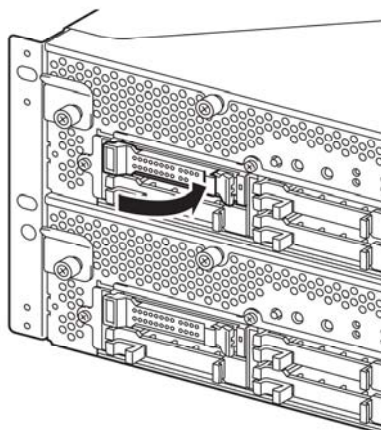
8. Press the POWER switch to power on.

9. Install the front bezel.

10. Refer to "Set Dual Disk Configuration" in the User's Guide (Setup) to set the dual disk configuration.

Removing 2.5-inch Hard Disk Drive

Follow the procedure below to remove the hard disk drive.

IMPORTANT:

Make sure to read "ANTI-STATIC MEASURES" and "PREPARING YOUR SYSTEM FOR UPGRADE" before you take the following procedures.

1. Shut down the OS.

   The system turns off automatically.

2. Remove the front bezel.

3. Push the lever of the hard disk to unlock the handle.
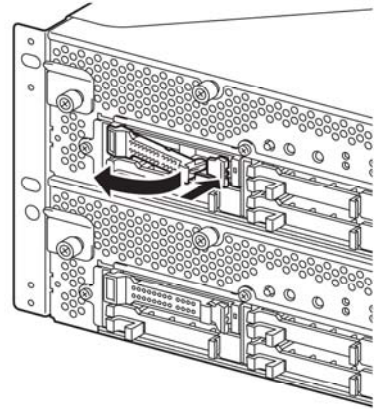
4. Hold the handle and hard disk to pull them off.

5. Install the dummy tray in an empty tray according to procedures described in "Installing 2.5-inch Hard Disk Drive."

   Ensure to install the dummy slot in the empty slot to improve the cooling effect within the device.
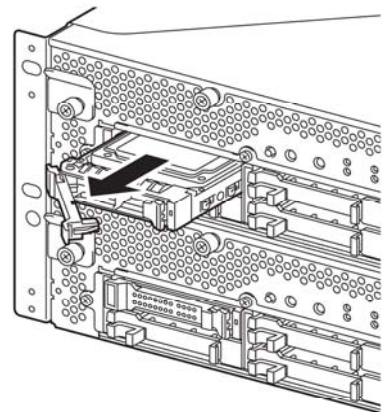
Replacing 2.5-inch Hard Disk Drive

Follow the procedure below to remove the failed hard disk drive. The hard disk drive is replaced with new device with the server powered on.

> **IMPORTANT:**
> Make sure to read "ANTI-STATIC MEASURES" and "PREPARING YOUR SYSTEM FOR UPGRADE." You can replace disks during continuous operation.

Replacing the Hard Disk Drive

1. Locate the failed hard disk.

   When a hard disk fails, the DISK ACCESS LED on the hard disk drive's handle illuminates amber.

2. Remove the failed hard disk referring to "Replacing a hard disk drives" on page 3-5

3. Refer to the steps in "Installing 2.5-inch Hard Disk Drive" to install a new hard disk.

> **CHECK:**
> ■ The hard disk to be installed for replacement must have the same specifications as its mirroring hard disk.
>
> ■ Use unsigned hard disk drive for replacement. To use the signed disk, it is necessary to recover the duplex configuration by referring to "Disk Operation" in chapter 3 after formatting the disk physically.
>
> ■ As to physical format, refer to "SAS BIOS - SAS Configuration Utility -s" in Chapter 4, "System Configuration" in the separate volume of the User's Guide, and perform Format Disk with Disk Utilities.
>
> ■ Before performing physical formatting, change [Option ROM Scan Monitoring] to [Disabled] on [Server] - [Monitoring Configuration] on the BIOS setup utility.
>
> ■ Refer to the separate volume of the User's Guide User's Guide "SYSTEM BIOS - SETUP -" in "Chapter 4 System Configuration" for configuration.

4. Restore the redundant configuration (see Chapter 3).

CPU/IO MODULE

To replace a CPU (processor, DIMM (memory), PCI card, you need to remove the CPU/IO module.

IMPORTANT:
- Ask your sales agent to replace the CPU/IO module and components of the CPU/IO module.

- Make sure to read "ANTI-STATIC MEASURES" and "PREPARING YOUR SYSTEM FOR UPGRADE."

- To install or remove CPU or DIMM, first power off the server before removing the CPU/IO module.

- Removing the module being operating may cause unexpected trouble. Use the ftsmaint command to identify the module to be removed so that the module is removed when it is stopped, without fail.
  Then remove the relevant module after verifying the Status LED on the CPU/IO module. See Chapter 2 "LEDs" for details of the Status LED.

Precautions

When replacing both CPU/IO modules, replace one module and wait until dual configuration is established to replace the other module. If you replace the both modules simultaneously, establishing dual CPU/IO module configuration can result in interruption of the whole system.

Removing CPU/IO Module

Follow the procedure below to remove the CPU/IO module.

1. Stop the CPU/IO module you want to remove.

To stop the server, execute ftsmaint command on the console OS.
Refer to Chapter 5 "Maintenance of NEC Express5800/ft series" for details.

If the CPU/IO module to be removed is CPU/IO module 0, stop the CPU module 0 first as follows.

cd /opt/ft/bin
./ftsmaint bringdown 0

With the following command, check that the Status of the CPU module is OFFLINE.

./ftsmaint ls 0

Similarly, stop the PCI module 0.

./ftsmaint bringdown 10

Check that the Status of the PCI module is OFFLINE.

./ftsmaint ls 10

TIPS:

To remove CPU/IO module 1, execute "Stop" operation for CPU module (ID:1) and PCI module (ID:11).

---

2. Remove the front bezel

3. Disconnect the power cable of a removing module.
The stopper will return to the vertical position when you disconnect

Stopper

CHECK:

Check whether the stopper drops down after disconnecting the power cable. If you disconnect the cable and the stopper does not go back to this position, you cannot pull out the CPU/IO module in the next step.

---
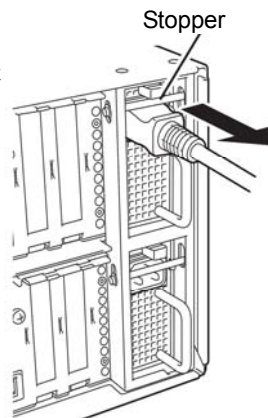
4. Loosen the screws securing the CPU/IO module handle to press down the handle.

> **IMPORTANT:**
>
> Before you pull out a CPU/IO module, check the rear of the server to make sure cables for connection with peripheral equipment or network are disconnected. If any cables are connected, keep a record of where the cables are connected and disconnect all cables connected to the module you are to pull out.

> **TIPS:**
>
> If you cannot disconnect the LAN cable easily, disconnect while pressing the latch with a slotted screwdriver.
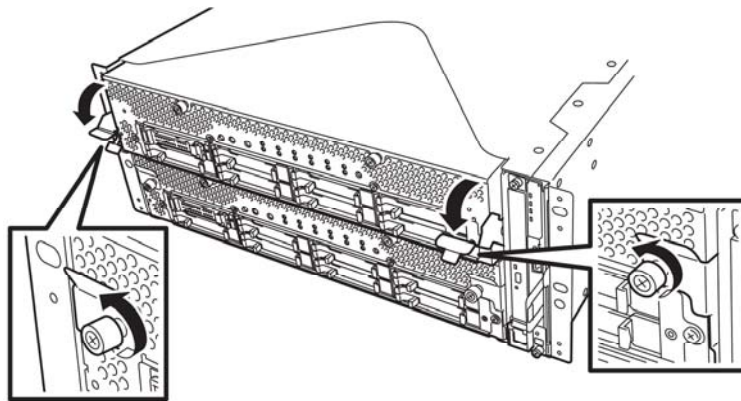
5. Hold the black levers of the CPU/IO module and pull it off.
Pull it off until it is locked and stopped.

> **IMPORTANT:**
>
> ■ Do not hold part other than the handle to pull the module.
>
> ■ Handle the CPU/IO module carefully. Do not drop the module or bump it against parts in the device when you remove it.
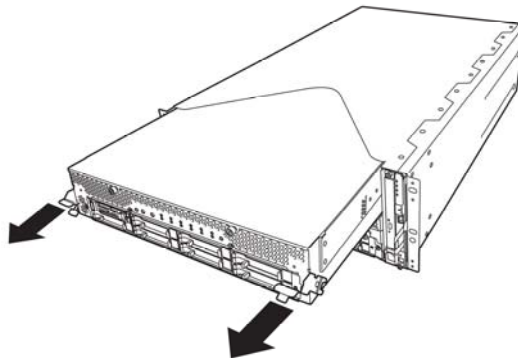
6. The CPU/IO module is locked on the way and cannot be pulled out. Lower the lock on the side of CPU/IO module and unlock it, and then pull it out.

Lock
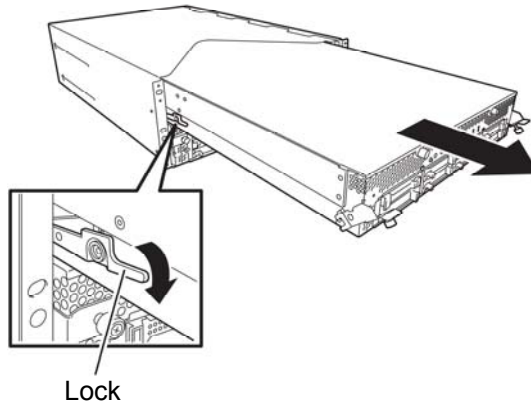
7. Pull out the CPU/IO module gently and carefully place it on a flat and sturdy table. Avoid the dusty or humid place.

This allows you to access the devices in the CPU/IO module. For more information on how to handle these devices, see the associated sections.

Installing CPU/IO Module

Follow the procedure below to install the CPU/IO module:

> **IMPORTANT:**
>
> - Ensure to read "ANTI-STATIC MEASURES" and "PREPARING YOUR SYSTEM FOR UPGRADE."
>
> - Insert the black lever slowly and fasten the screws tightly. Be careful not to cause a shock to the device at this time.

1. Firmly hold the CPU/IO module with both hands and insert it into the rack.

Hold the CPU/IO module in such a way that its back panel connector faces the back of the rack and engage the guides of the module and chassis, and insert it slowly.
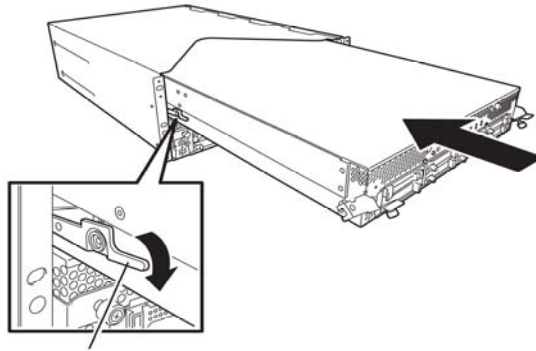
Lock

2. Push up the black levers placed on the left and right sides of the front of the CPU/IO module, and fasten them with screws.
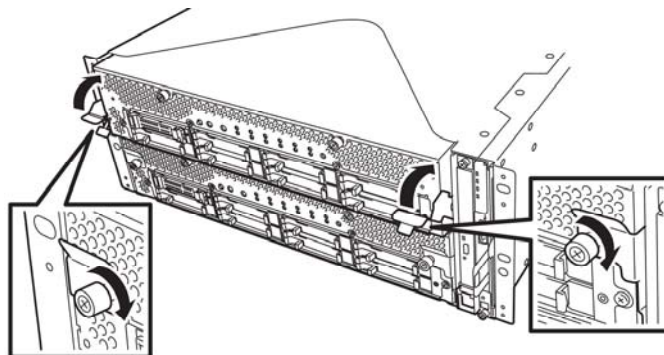
IMPORTANT:

- Secure the handle with the screws. If it is not secured by the screws, the operation of the CPU/IO module will be unstable.

- In some system statuses or settings, auto start up or integration does not take place when the module is connected. In such a case, check the status by using the ftsmaint command, and then start up the CPU/IO modules.

3. Connect the cables for connecting the peripheral devices and network.

4. Hold the stopper with your hand and insert the cable of the installed module.

5. The installed CPU/IO module will be automatically started.

DIMM

The DIMM (dual inline memory module) is installed to the DIMM socket in the CPU/IO module on the NEC Express5800/ft series.

The CPU/IO module board has 12 sockets for DIMM.

TIPS:

- Up to 96GB(8GB x 12) memory can be additionally installed.

- In the error messages and logs in POST NEC ESMPRO, or Off-line Maintenance Utility, the DIMM connector may be described as "group." The number next to "group" corresponds to the slot number shown in the figure on the next page.

IMPORTANT:

- The DIMM is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the DIMM. Do not touch the DIMM terminals or onboard parts with a bare hand or place the DIMM directly on the desk. For more information on static electricity, see "ANTI-STATIC MEASURES."

- Make sure to use the DIMM authorized by NEC. Installing a third-party DIMM may cause a failure of the DIMM as well as the server. Repair of the server due to failures or damage resulted from installing such a board will be charged.

- Before adding or removing DIMMs, power off the server and detach the CPU/IO module.

- Make sure to read "ANTI-STATIC MEASURES" and "PREPARING YOUR SYSTEM FOR UPGRADE" before installing/removing DIMM.
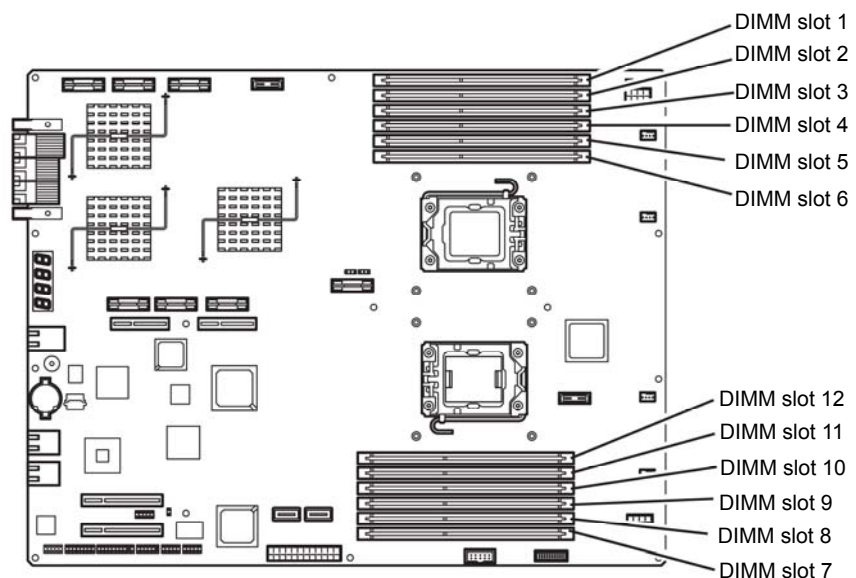
Motherboard of the CPU/IO module

Precautions

Note the following to install or replace DIMM.

- DIMM 7 through 12 are available only when the processor(CPU)#2 is installed.

- To install DIMM, install the product with the same serial number to the same CHs and slots of the CPU/IO modules 0 and 1.

- Refer to the following table to install additional DIMM.

Installable DIMM capacity corresponding to number of CPUs		Slot number to install DIMM											
		Upper side of motherboard (From 1 to 6)						Lower side of motherboard (From 7 to 12)					
CPUs	Capacity	1	2	3	4	5	6	12	11	10	9	8	7
1	2GB	2											
	4GB	2		2									
	6GB	2		2		2							
	8GB	2	2	2		2							
	10GB	2	2	2	2	2							
	12GB	2	2	2	2	2	2						
	12GB	4		4		4							
	24GB	4	4	4	4	4	4						
	24GB	8		8		8							
	36GB	8	4	8	4	8	4						
	48GB	8	8	8	8	8	8						
2	2GB	2											
	6GB	2		2		2							
	10GB	2	2	2	2	2							
	4GB	2											2
	8GB	2		2							2		2
	12GB	2		2		2			2		2		2
	16GB	2	2	2		2			2		2	2	2
	20GB	2	2	2	2	2			2	2	2	2	2
	24GB	2	2	2	2	2	2	2	2	2	2	2	2
	24GB	4		4		4			4		4		4
	36GB	4	2	4	2	4	2	2	4	2	4	2	4
	48GB	4	4	4	4	4	4	4	4	4	4	4	4
	48GB	8		8		8			8		8		8
	72GB	8	4	8	4	8	4	4	8	4	8	4	8
	96GB	8	8	8	8	8	8	8	8	8	8	8	8

Installing DIMM

Follow the procedure below to install the DIMM.

1. Shut down OS.

The sever turns off automatically.

2. Disconnect the power cords from the outlets.

3. Remove the CPU/IO module referring to page 8-12.

4. Remove three screws (two on the front and one on the rear), and remove the top cover of the CPU/IO module.
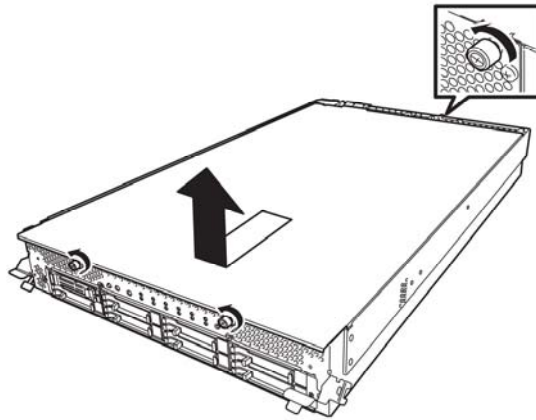

5. Remove the air duct.

Air duct
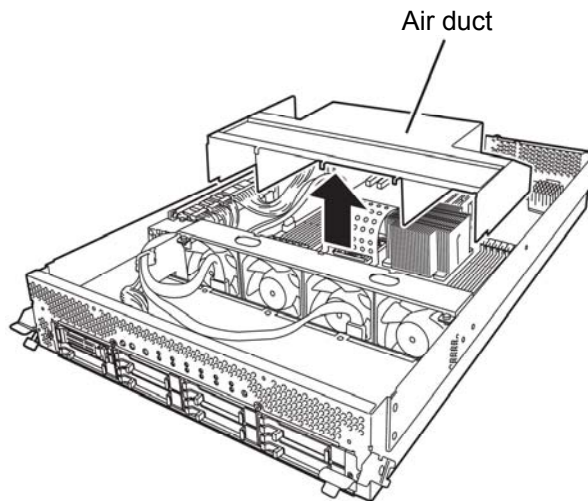
6. Check to be sure in which socket you are mounting the DIMM

7. Remove the dummy memory module by opening the levers on both sides of the DIMM slot.

> ### IMPORTANT:
>
> Keep and store the removed dummy memory module with care.

Dummy memory module
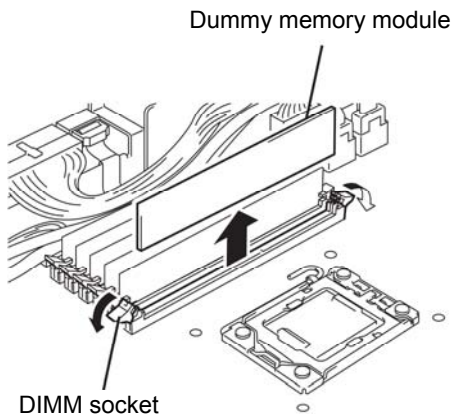
DIMM socket

8. Insert a DIMM into the DIMM socket vertically.

> ### TIPS:
>
> Pay attention to the direction of the DIMM.
> The terminal of the DIMM has a cutout to prevent misinsertion.
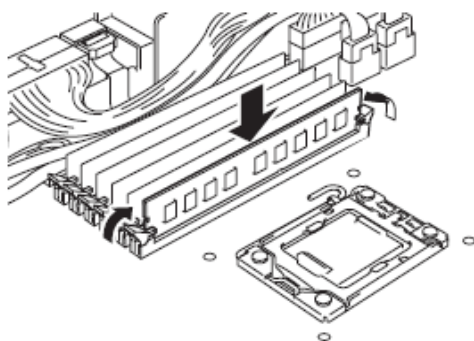
After the DIMM is completely inserted into the socket, the levers are automatically closed.

9. Attach the air duct

10. Place the top cover of the CPU/IO module and secure it with three screws.
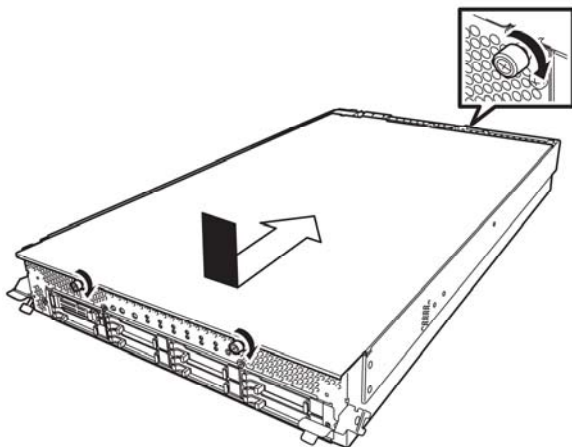
11.   Refer to page 8-15 and install the CPU/IO module.

12.   Connect the power cords.

13.   Press the POWER switch to power on the server.

14.   Verify that POST displays no error message.

If POST displays an error message, write it down and see the POST error message list on page 7-4.

Removing DIMM

Follow the procedure below to remove the DIMM.

IMPORTANT:

This server works only when there are at least two DIMMs installed.

1. Shutdown OS.
    The system turns off automatically.

2. Disconnect the power cords from the outlets.

3. Remove the CPU/IO module referring to page 8-12.

4. Remove three screws (two on the front and one on the rear), and remove the top cover of the CPU/IO module
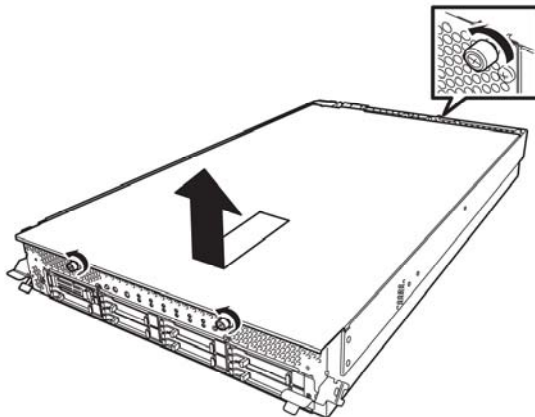
5. Remove the air duct.
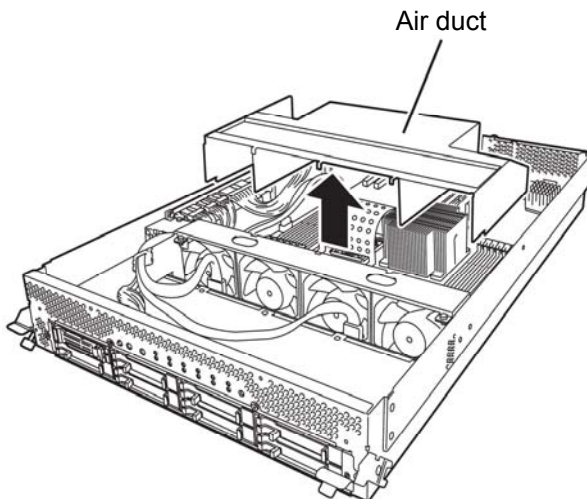
Air duct

6. Open the levers attached on both sides of the socket of the DIMM to be removed. It will be unlocked and the DIMM can be removed.
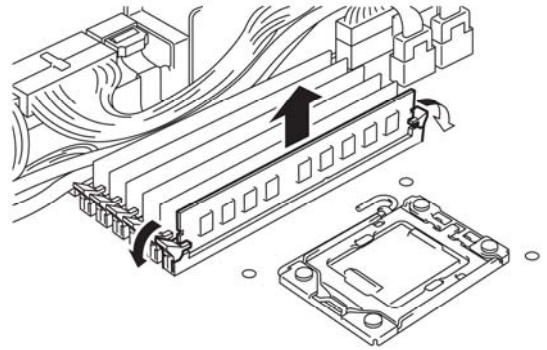
7. Attach the dummy memory module.

8. Attach the air duct.

9. Place the top cover of the CPU/IO module and secure it with three screws.
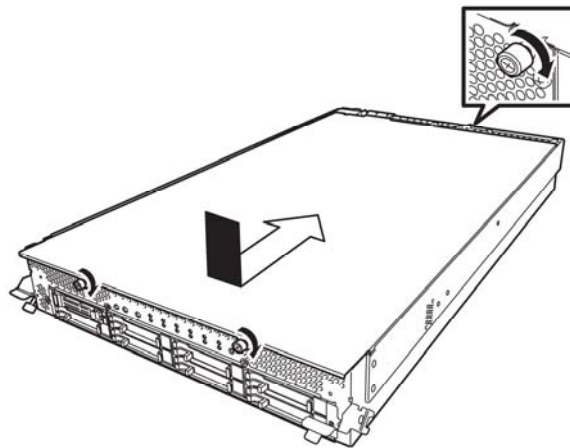
10. Refer to page 8-15 and install the CPU/IO module.

11. Connect the power cords.

12. Press the POWER switch to power on the server.

13. Verify that POST displays no error message.

If POST displays an error message, write it down and see the POST error message list on page 7-4.

Replacing DIMM

Follow the procedure below to replace a failed DIMM.

1. Identify the failed DIMM by referring to the memory slot error LED.

2. Remove the CPU/IO module referring to page 8-12.

3. Replace the DIMM.

4. Install the CPU/IO module referring to page 8-15.

5. Start up the CPU/IO module using /opt/ft/bin/ftsmaint bringup command.

PROCESSOR (CPU)

In addition to the standard CPU (Intel® Xeon^TM Processor), you can operate the system by adding one CPU.

IMPORTANT:

- The CPU is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the CPU. Do not touch the CPU terminals or onboard parts with a bare hand or place the CPU directly on a desk. Ensure to read "ANTI-STATIC MEASURES" for more information on static electricity.

- Do not use the system before checking to see it works correctly.

- Make sure to use the CPU specified by NEC. Installing a third-party CPU may cause a failure of the CPU as well as the server. Repairing the server due to failures or damage resulting from these products will be charged even if it is under guarantee.

- Before adding or removing a CPU, power off the server and then remove the CPU/IO module.

CPU 1
(Standard CPU)

CPU 2
(Additional CPU)
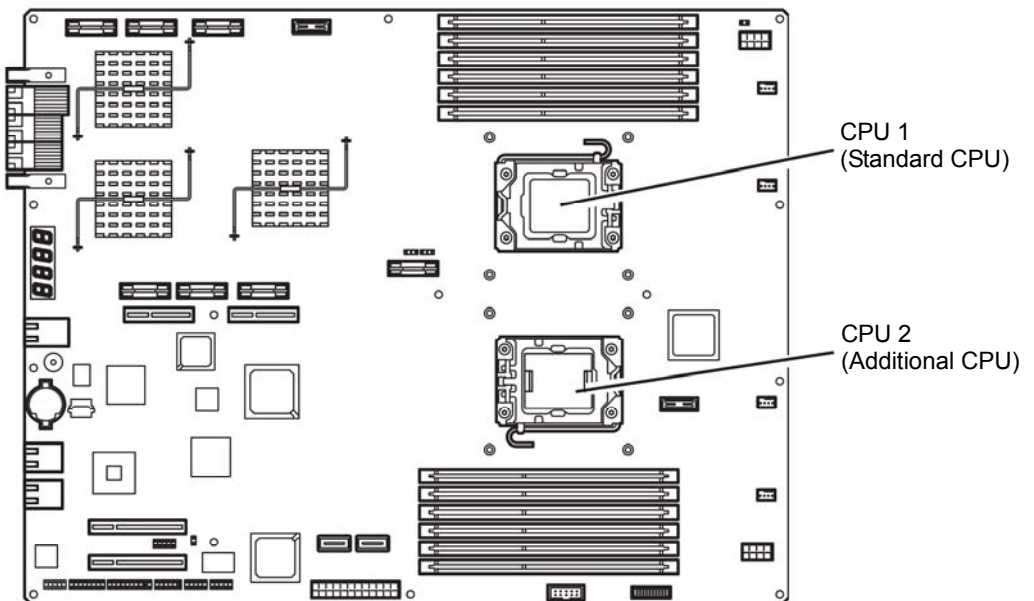
Installing CPU

Follow the steps below to install a CPU (model with air-cooling kit).

1. Shut down the OS.
The server is automatically powered off.

2. Unplug the power cords.

3. Remove the CPU/IO module referring to page 8-12.

4. Remove the air duct cover referring to page 8-22.

5. Verify the location of the CPU socket.

6. Remove four screws that secure the dummy heat sink.
Remove the dummy heat sink.

> **IMPORTANT:**
>
> Keep and store the removed dummy heat sink and
> four screws with care.

Dummy heat sink
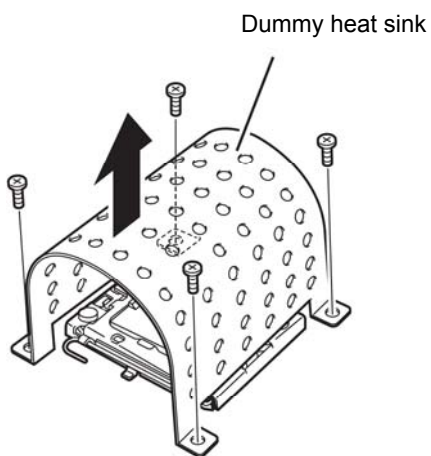
7. Lift the socket lever.
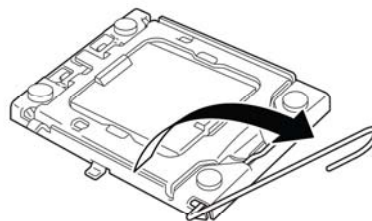
8. Lift the CPU socket holder.
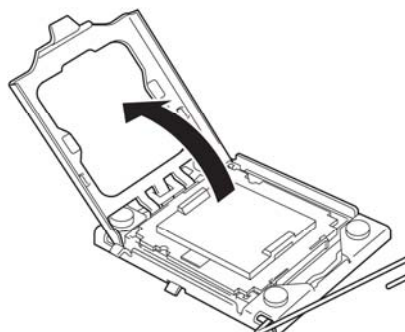
9. Detach the socket cover on the CPU socket.

IMPORTANT:

Keep and store the removed socket folder with care.
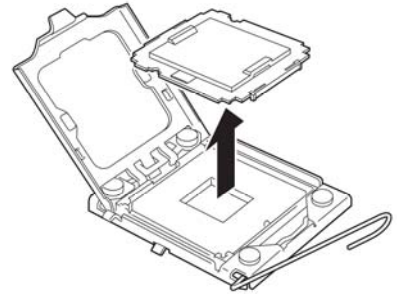
10. Place the CPU on the socket carefully.

TIPS:

Pay attention to the direction of the CPU.
The CPU and socket have pin marks to prevent
misinsertion. Check the pink marks of the CPU and
the socket, and insert the CPU correctly.
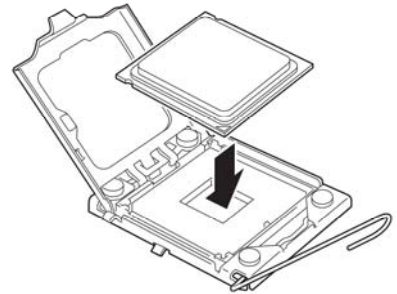
11. After pressing the CPU softly against the socket,
place the CPI socket holder back to its original
place.
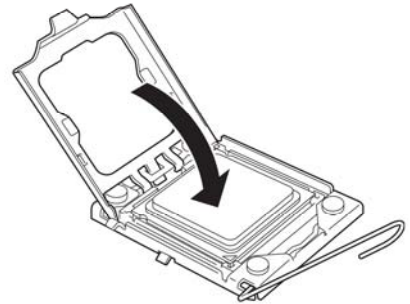
12. Return the socket lever back to its original place.
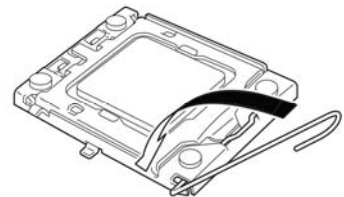
13. Place the heat sink on the CPU.

IMPORTANT:

Do not touch the cooling sheet that is attached on the back of the heat sink with your hand.
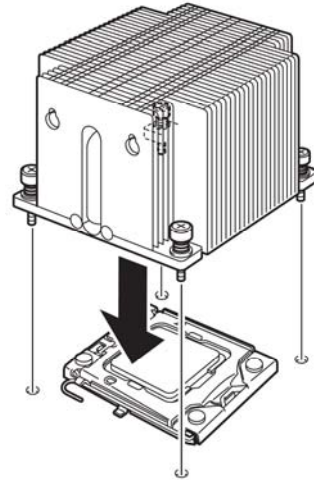
IMPORTANT:

If you install additional CPU, ensure that the fins of the additional CPU's heat sink are in the same direction as those of the standard CPU.

Heat sink of
the standard CPU

**Front of
the Server**

Heat sink of
the additional
CPU

**Rear of
the Server**
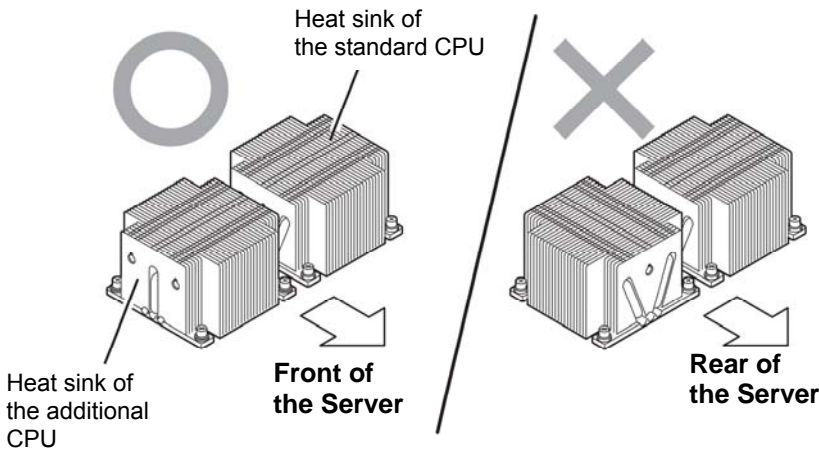
14. Fasten the heat sink with four screws..

IMPORTANT:

Check that you have tentatively fastened the screws diagonally with the order on the right figure, and that they the heat sink is attached to the CPU socket in parallel level.
Then, tighten the screws with the order shown on the right.
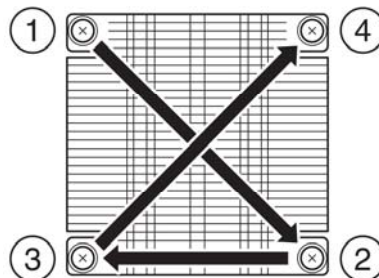
15. Install the air duct.

16. Refer to page 8-15 and install the CPU/IO module.

17. Connect the power cord.

18. Turn on the power by pressing the POWER switch.

19. Verify that POST displays no error message. If an error message is displayed, write it down and check it in the error message list on page 7-4.

Removing CPU

Removal of a heat sink and CPU is the reverse procedure of installation.

PCI BOARD

Either two or four PCI boards can be installed to the CPU/IO module.

> **IMPORTANT:**
>
> ■   The PCI board is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the PCI board. Do not touch the PCI board terminals or onboard parts by a bare hand or place the PCI board directly on the desk. For more information on static electricity, see "ANTI-STATIC MEASURES" on page 8-3.
>
> ■   Make sure to read "ANTI-STATIC MEASURES" and "PREPARING YOUR SYSTEM FOR UPGRADE."

Note the following to install or replace PCI board.

■   Some PCI boards need to be duplexed. To make a dual PCI board configuration, install the same type of board (i.e., having the same specifications and performance) to the same slot for each group.

When a PCI board is installed to one group, another identical PCI board should be installed to the same slot in another group. This rule is applied to the case of removal.

PCI 2   PCI 1

R320a-E4

PCI 2   PCI 1   PCI 4   PCI 3   Riser Card
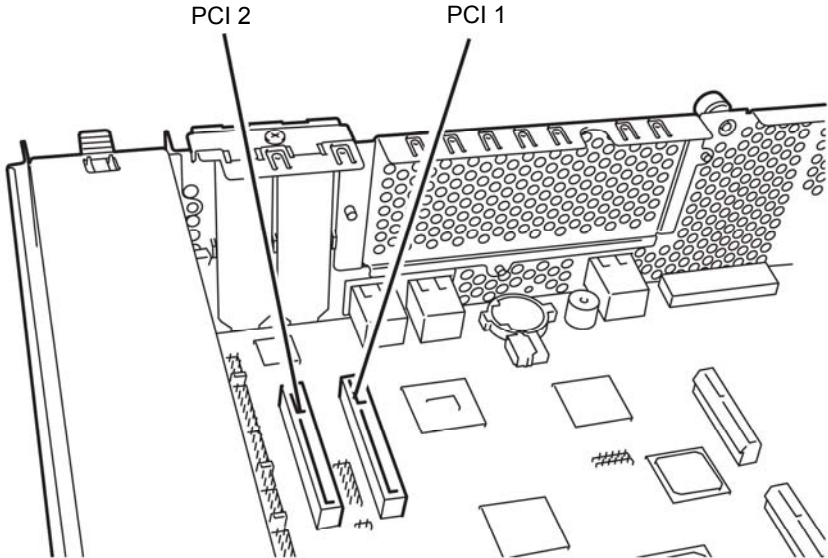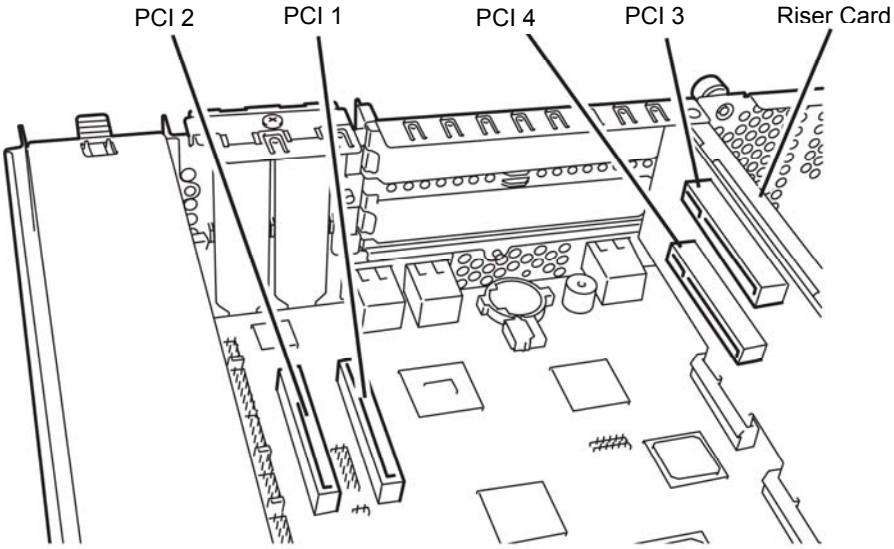
R320a-M4

List of option PCI boards and installable slots

■R320a-M4 model

N-code	Product name		PCI-1	PCI-2	PCI-3	PCI-4	Remarks
	PCI slot performance		PCIe 1.1 x4 lane	PCIe 1.1 x4 lane	PCIe 2.0 x4 lane	PCIe 2.0 x4 lane	Remarks
	Slot size		Low Profile		Full Height		
	PCI board type		x8 socket				
	Mountable board size		312 mm and less (long/short)		167.6 mm and less (MD 2)		
N8804-007	1000BASE-T 2ch board set		✓	✓	✓	✓	*1
N8803-035	Fibre Channel board set		✓	✓	✓	✓	*1

*1 Exact the same board must be mounted into the same slot for each CPU/IO module 0, 1.

■R320a-E4 model

N-code	Product name		PCI-1	PCI-2	PCI-3	PCI-4	Remarks
	PCI slot performance		PCIe 1.1 x4 lane	PCIe 1.1 x4 lane	PCIe 2.0 x4 lane	PCIe 2.0 x4 lane	Remarks
	Slot size		Low Profile		Full Height		
	PCI board type		x8 socket				
	Mountable board size		312 mm and less (long/short)		167.6 mm and less (MD 2)		
N8804-007	1000BASE-T 2ch board set		✓	✓	N/A	N/A	*1
N8803-035	Fibre Channel board set		✓	✓	N/A	N/A	*1

*1 Exact the same board must be mounted into the same slot for each CPU/IO module 0, 1.

Installing PCI Board

Follow the procedure below to install the board to be connected to the PCI board slot.

TIPS:

To install the PCI board, make sure the shape of the board connector matches with the shape of the PCI board slot connector.
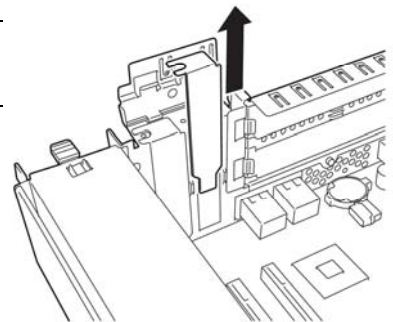

Installing Low Profile PCI Board

1. Shut down the OS.

The server is automatically powered off.

2. Unplug the power cords.

3. Remove the CPU/IO module by referring to page 8-12.

4. Remove one screw that secures the stopper and remove it.
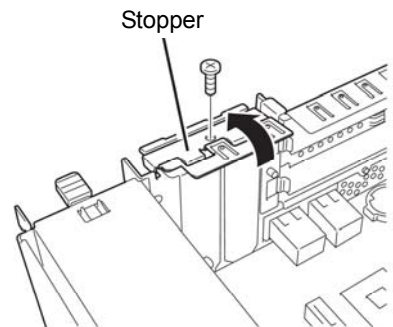
Stopper

5. Verify the location of the CPU socket.

6. Remove the PCI bracket cover.

IMPORTANT:

Keep and store the removed PCI bracket cover with care.

---

7. Install a PCI board in a PCI slot.
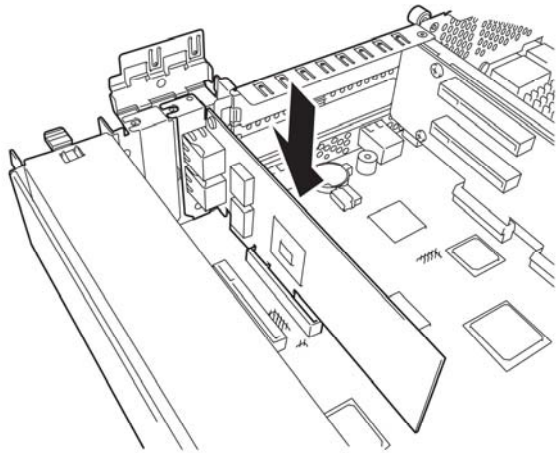
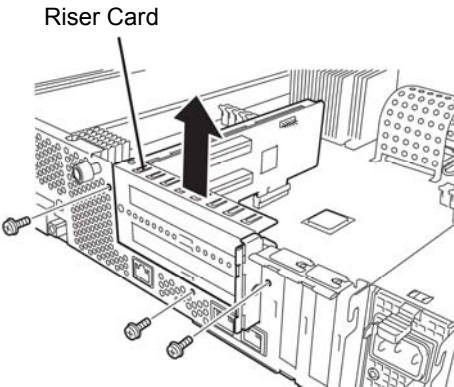**8.** Install the stopper and secure with one screw.
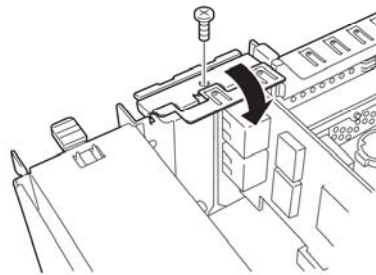
9. Refer to page 8-15 and install the CPU/IO module.

10. Plug the power cord.

11. Press the power swtich and power on the server.

12. Verify that there is no error message displayed at POST screen.
If there is one, write down the error message and refer to 7-4 for the list of error messages.

Installing Full Height PCI Board

1. Shut down the OS.
The server is automatically powered off.

2. Unplug the power cords.

3. Remove the CPU/IO module referring to page 8-12.

4. Remove one screw that secures the stopper and remove it.
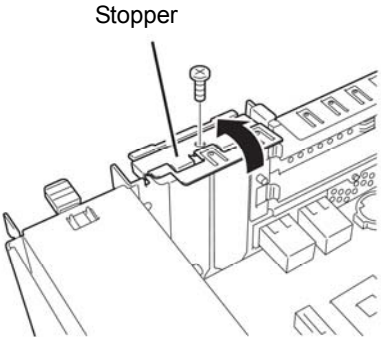
Stopper

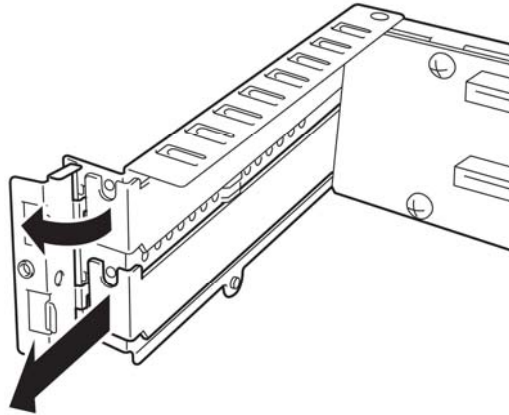**5.** Remove three screws that secure the Riser Card, and remove it from the motherboard.

Riser Card

6. Remove one screw that secures the stopper and remo the stopper from the Riser Card.

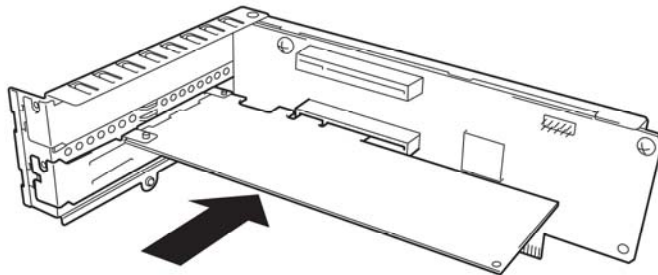**7.** Verify the location of the CPU socket.
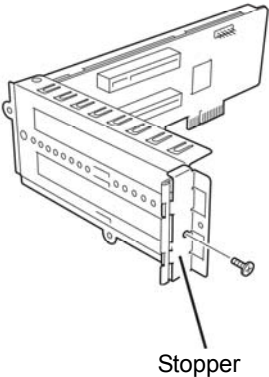
Stopper

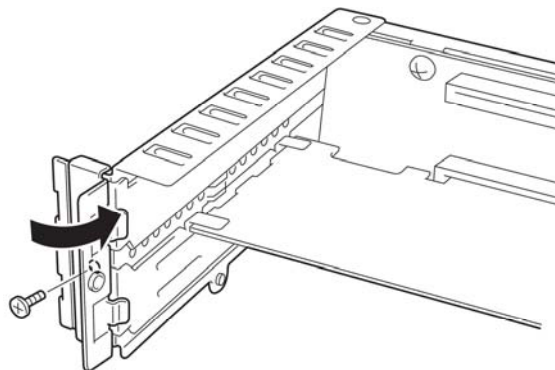**8.** Remove the PCI bracket cover.

IMPORTANT:

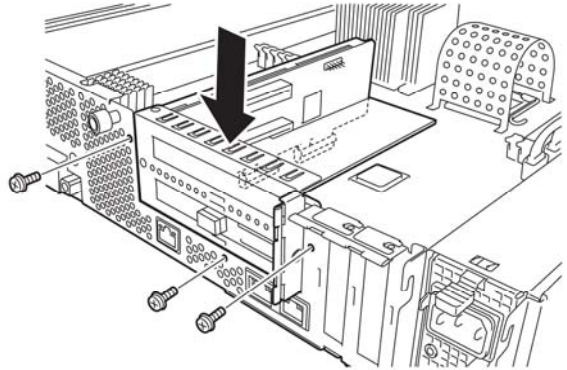Keep and store the removed PCI bracket cover with care.

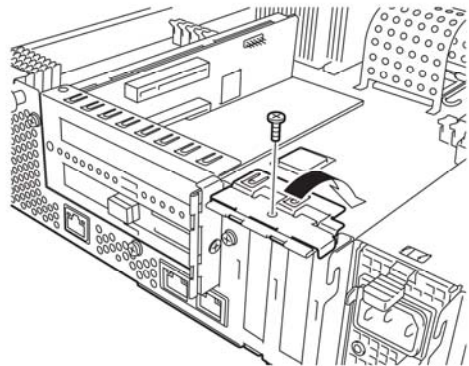**9.** Install a PCI board in a PCI slot.

10. Install the stopper and secure with one screw.

11. Install a Riser Card on the motherboard and secure it with three screws.

12. Install the stopper and secure it with one screw.

13. Refer to page 8-15 and install the CPU/IO module.

14. Plug the power cord.

15. Press the power swtich and power on the server.

16. Verify that there is no error message displayed at POST screen.
If there is one, write down the error message and refer to 7-4 for the list of error messages.

Removing PCI Board

To remove PCI board card, follow the reverse procedure of the installation and install the expansion slot cover.

Replacing PCI Board

Follow the procedure below to replace the failed PCI board.

<Other than N8803-035 Fibre Channel Board Set>

1.   Check the failed board from the log.

2.   Remove the CPU/IO module referring to the page 8-12.

3.   Remove the PCI bracket, then remove the PCI board.

4.   Replace the board and fasten it.

5.   Install the CPU/IO module referring to the page 8-15.

6.   Connect the network cable and cables for PCI boards.

7.   The installed CPU/IO module will start automatically.

8.   Confirm that the PCI board is correctly recognized by POST and OS.

＜N8803-035 Fibre Channel Board set＞

1.   Check the failed board from the log.

2.   Remove the CPU/IO module referring to the page 8-12.

3.   Configure WWPN of HBA (setting/confirming access control) newly installed on control software such as iStorageManager.

4.   Remove the PCI bracket, then remove the PCI board.

5.   Replace the board and fasten it.

6.   Install the CPU/IO module referring to the page 8-15.

7.   Connect the network cable and cables for PCI boards.

8.   The installed CPU/IO module will start automatically.

9.   Confirm that the PCI board is correctly recognized by POST and OS.

Setup of Optional PCI Board

IMPORTANT:

■   To enable the fault-tolerant feature of the optional device, the identical PCI boards must be installed to the slots with the same number in CPU/IO module 0 and CPU/IO module 1.

■   The BIOS settings need to be modified when mounting some optional PCI boards. To change the BIOS settings, start the BIOS setup utility to change the [OS Boot Monitoring] configuration in [Server] – [Monitoring Configuration]. See page 4-28 for more details.

■   For the supported connecting devices, contact your sales agent.

N8804-007   1000BASE-T 2ch board set

IMPORTANT:

For LAN cable's connector, use a RJ-45 connector which is compliant with IEC8877 standard. If any other connector is used, it may not be removed easily.

■   List of slots to install optional PCI boards

Refer to "List of option PCI boards and installable slots" on page 8-32.

■   Driver installation procedure

You do not need to install drivers for N8804-007 board because they are included in the OS. After installing the boards, refer to 3-8 "Duplex LAN Configuration" to set the dual LAN.

N8803-035 Fibre Channel Board Set

■ List of slots to install optional PCI boards

   "List of option PCI boards and installable slots" on page 8-.32.

■ Driver installation procedure

   You do not need to install drivers for N8803-035 board because they are included in the OS.

Appendix A

Specifications

Item		NEC Express5800/R320a-E4 N8800-149F	NEC Express5800/R320a-M4 N8800-150F
CPU	Type	Intel® Xeon® Processor(E5504)	Intel® Xeon® Processor(X5570)
	Clock	2GHz	2.93GHz
	FSB	4.8GT/s	6.4GT/s
	Second cache	1MB	1MB
	Third cache	4MB	8MB
	Standard	Up to 1 processors (the number of processors installed per module)	
	Maximum	Up to 2 processors (the number of processors installed per module)	
Chipset		Intel 5500 Chipset + ICH10R	
Memory	Standard	None	
	Minimum	It is recommended more than 8GB memory.	
	Maximum	96GB (The standard DIMM must be replaced.)	
	Expansion unit	1 DIMM (2GB DIMM) 3 DIMM (4GB DIMM and 8GB DIMM)	
	Memory module	DDR3-1066 Registered DIMM	
	Error check	ECC	
Graphics (VRAM)		PILOT2 (32MB)	
Auxiliary input device	Floppy disk (option)	3.5 inch drive x 1 (USB) * ESX4.0 does not support USB floppy disk drives.	
	Optical Disk Drive (standard)	DVD-RAM（Load type: tray. Speed: x6）	
	Hard disk (standard)	None	
	Hard disk (maximum)	4.8TB*(300GB×16) * The user area is reduced to a half of the physical capacity due to software mirroring.	
File bay (2.5 inch)		16 slots	
Additional slot		PCI-ExpressREV1.1 x8slot ×2	PCI-ExpressREV1.1 x8slot ×2 PCI-ExpressREV2.0 x8slot ×2
LAN interface		1000BASE-T ×2	
External interface	USB	4-pin connector x4 Keyboard occupies one port.	
	Network	100/1000BASE-T x2, LAN for management x1	
	Display	MINI D-sub 15-pin x1	
Cabinet design		Rack-mount type	
External dimensions		483 (w) × 178 (h) × 736 (d) mm	
Weight		Max. 51.5kg	
Power supply		AC100V - 240V ±10%, 50/60Hz±3Hz	
Power consumption		1400VA, 1390W	
Environmental requirements	In operation	Temperature　10 to 35°C Humidity　20 to 80% RH (non-condensing)	
	In storage	Temperature　-10 to 55°C Humidity　20 to 80% RH (non-condensing)	
Support OS		vSphere4.0 update1	
Appended goods		NEC EXPRESSBUILDER(DVD),Packing list, User'sGuide,User'sGuide(Setup)	

Caution The sleep and hibernation function uncorresponds.

N8800-149F, EXP320L
NEC Express5800/R320a-E4
N8800-150F, EXP320M
NEC Express5800/R320a-M4
User's Guide