N8800-143F, EXP320L
NEC Express5800/R320a-E4
N8800-144F, 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 a personal injury due to 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：
此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻擾動，在此種情況下，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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판매자 또는 사용자는 이점을 주의하시기 바라며

가정외의 지역에서 사용하는 것을 목적으로 합니다.

CE Statement

Australia EMI:
Warning: 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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US Patent Number: 5,732,212/5,937,176/6,633,905/6,681,250/6,701,380 (other patents pending)

Taiwanese Patent Number: 173784

European Patent Number: 0 740 811

To prevent voltage sag:

This product may be affected by voltage sag caused due to lightning. To prevent voltage sag, you are recommended to use an AC uninterruptible power supply (UPS) unit.

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 Windows operating system, 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 Windows operating systems 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   Windows Setup and Operation
This chapter describes setup and operation specific to the product when it is on Windows.

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 this equipment.

Do not let water or foreign objects (e.g., pins or paper clips) enter this equipment. There is a risk of a fire, electric shock, and breakdown. When such things accidentally enter this 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 step on the cable.
- 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:
sodium chloride, 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 this equipment when it threatens to thunder. If it starts to thunder before you unplug this equipment, do not touch this 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 Windows or Linux, 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
  : W2K8 OS : MAX 96GB
  : W2K3 OS : MAX 48GB

- 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

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.

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 Linux Server-based applications.

NEC Express5800/ft series achieves continuous computing operations for the Linux server 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 the Log 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 is 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 Linux-compliant applications on NEC Express5800/ft series. Thus, unlike other highly fault-tolerant products, special API or scripts are not necessary.

- Automatic mirroring

  NEC Express5800/ft series automatically maintains data as the current data.

- Automatic detection and notification of faults

  NEC Express5800/ft series detects and sorts out all events such as general status changes and faults, and notifies Log of these events.

- 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.

■　　Event notification function

When trouble or other events are detected on NEC Express5800/ft series, they will be notified to Log and saved. Therefore, you can view the log items locally or remotely by a usual Linux procedure. Since an NEC Express5800/ft series events use unique IDs, they are easy to distinguish.

■　　In-service repairing

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

■　　Partition structure

On this server model, the first logical drive will be the following state when the setup by NEC EXPRESSBUILDER is complete.

Free area (*)

Partition for operating system (*)

* The size varies depending on the specification at setup.

CHECK:

The partition for operating system is not mirrored at the time of NEC EXPRESSBUILDER setup completion. Mirror the partition separately.

■　　Linux OS and media

The Linux OS media used on NEC Express5800/ft series are not specifically processed for it. The standard operating methods of Linux are same as general.

HOW THE OPERATING SYSTEM SEES THE CPU MODULES

On NEC Express5800/ft series, the CPU modules are redundantly configured and all processors installed on this server are shown.

How CPU modules appear on Task Manager

CPUs are displayed as many as there are.

System with one CPU (Quad-Core)

System with two CPUs (Quad-Core)

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 2-8 and rear view on page 2-10.

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 DVDs or CD-ROMs.

(6)   Optical disk drive
This device is used to read data from the disks such as DVDs and CD-ROMs (see page 2-29).

(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. The LED illuminates in green when executing Active Upgrade.

(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 2-17).

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 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.

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.

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

(3)   DIMM slot
    DIMM7 – DIMM12 from the bottom.

(4)   Connector for PCI card
    (4)-1   PCI slot #1
    (4)-2   PCI slot #2

(5)   LAN connector
    (5)-1   LAN1
    (5)-2   LAN2

(6)   Lithium battery

(7)   Management port

(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-ROM 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 OS.

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

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 4-33).

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, the other 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.

The following devices are connected to the primary CPU/IO module by the hardware switch, although those can be connected to both CPU/IO modules 0 and 1. When one CPU/IO module is disconnected because of a failure, those are switched to the other module automatically and continue operating.

- ■   VGA (display)

- ■   USB device (keyboard, mouse, floppy disk drive)

> **TIPS:** Both CPU/IO modules 0 and 1 can access to the optical disk drive. If one CPU/IO module is isolated because of the failure, only the optical disk drive of the other module can access to the drive.

> **IMPORTANT:**
>
> - ■   If the floppy disk drive is connected, the drive letter may change from A to B by switching CPU/IO modules. Changing of the drive letter does not affect the operation of the server. If the drive letter is changed, access the floppy disk drive with the changed drive letter.
>
> - ■   The drive letter of the optical disk drive is reallocated automatically. The unused letter is allocated to the drive in the order of D to Z. If you want to set the fixed drive letter to the optical disk drive, specify the letter which is not allocated in the order of D to Z after setting the hard disk drive letter..

Floppy Disk Drive (Option)

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

This server supports 3.5-inch 2HD (1.44 MB) and 2DD (720KB) floppy disks.

> **IMPORTANT:**
>
> ■ When using a USB floppy disk drive, the access to the floppy disk is delayed on rare occasions if the display graphic load is high because a moving picture is being played. In such a case, retry the operation with the floppy disk inside the floppy disk drive.
>
> ■ The drive letter of the USB floppy disk may be displayed as B instead of A. This does not affect the operation of the server. User B drive for the floppy disk drive.

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-ROM drive

NEC Express5800/ft series has a DVD-ROM drive on the front panel. It is a device used to read data from an optical disk (compact disc read-only memory). 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-ROM 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 DVD/CD-ROM

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.

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Chapter 3

Windows Setup and Operation

This chapter describes setup procedures to make NEC Express5800/ft series ready for use. 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

This section explains the disk operation by the RDR (Rapid Disk Resync) function.

NEC Express5800/ft series duplicates disks to secure data by using "Rapid Disk Resync (RDR) function". This section describes operations such as configuration of dual settings to disks and replacement of disks.

IMPORTANT:

■ Create a data disk partition after configuring the RDR.

Disk Operations Using the RDR (Rapid Disk Resync) Function

RDR (Rapid Disk Resync)

RDR function of ft control software secures reliability by making disks duplexed per disk. Duplexing disks by the RDR function enables the disks to be resynchronized in a short period of time when their mirror has been broken due to causes such as PCI module replacement.

Setting RDR to disks duplicates the disks of paired slots as shown in the figure below and Windows (ex. Disk Management and Device Manager) recognizes paired disks as a single virtual disk.

[Corresponding slots]

Slots corresponding to the mirroring process

Corresponding slot
PCI module 10 Slot 0 ⇔ PCI module 11 Slot 0
PCI module 10 Slot 1 ⇔ PCI module 11 Slot 1
PCI module 10 Slot 2 ⇔ PCI module 11 Slot 2
PCI module 10 Slot 3 ⇔ PCI module 11 Slot 3
PCI module 10 Slot 4 ⇔ PCI module 11 Slot 4
PCI module 10 Slot 5 ⇔ PCI module 11 Slot 5
PCI module 10 Slot 6 ⇔ PCI module 11 Slot 6
PCI module 10 Slot 7 ⇔ PCI module 11 Slot 7

* In the table above, PCI module names correspond as follows:
  PCI module (for CPU/IO module 0) - PCI module 10
  PCI module (for CPU/IO module 1) - PCI module 11

IMPORTANT: [Cautions for using the RDR function]

1. RDR can be set only to the disks inserted into the built-in slots of NEC Express5800/ft series.

2. Be sure to specify RDR to all disks inserted to the built-in slots and make duplex settings.

3. RDR can be set only to basic disks.
If a span volume or stripe volume is needed, make settings of RDR to a basic disk and then change the disk to a dynamic disk from [Disk Management].

4. The disks to set RDR must have the same capacity and must be new or physically formatted.
(For physical format, refer to "SAS BIOS" in Chapter 4 and perform Format Disk using Disk Utilities.)

5. Before performing physical formatting, change [Option ROM Scan Monitoring] as [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.

6. If the system is shut down (or restarted) while the mirror is broken, or a long time (30 minutes or longer) has passed after the mirror is broken, the mirror resynchronization target will be the entire disk.
For example, if the mirroring has been broken due to a PCI module failure, when you shut down the system and replace the PCI module in such a state, the entire area of the disk needs to be resynchronized.

7. You must insert a new disk or replace a disk while the server is powered on.

8. Create a data disk partition after configuring the RDR. If you create a data disk partition before configuring the RDR, the partition's drive letters may be deleted when the RDR is configured.

Configuring and Removing Duplexed Setting of Disks by the RDR Function

This section describes how to make disks duplex and how to remove the settings by using the RDR function. To use the RDR function, use [RDR Utility].

About RDR Utility

- Starting RDR Utility
  From [Start], select [All Programs] then [RDR] and click [RDR Utility] to start [RDR Utility].

- Screen

[Left pane]
The tree shows disks inserted to the built-in slots and virtual disks (RDR Virtual Disks) created by RDR. Right-click a disk on the tree to display the menu for setting RDR. By looking at the tree, you can know which disk corresponds to which disk of the Windows' [Disk Management] and whether RDR is set to the disk.

For example, in the case of the disk highlighted in the figure above:

<div style="text-align:center">

Slot0 － <u>Harddisk1</u>－<u>LUN2</u>－<u>PLEX0</u>
                  (1)   (2)   (3)

</div>

(1) Corresponds to the number of Windows' [Disk Management]. In this example, this disk is the Disk1 on [Disk Management].
(2) Corresponds to the number of a virtual disk created by RDR setting. In this example, this disk is a disk which makes up the RDR Virtual Disk 2 (only appears for disks with RDR setting).
(3) This section appears only for disks with RDR setting.

TIPS:

- There is no problem when the display appears not in the order of
  [RDR Virtual Disk 1] -> [RDR Virtual Disk 2] -> [RDR Virtual Disk 3]
  on the tree.

- Specify disks to correspond on the RDR Utility screen.
  The correspondence of disk number displayed on [Disk Management] and the drive
  letters may change when the system is restarted.

[Right pane]
The properties of the disk selected in the left pane are shown.
In the figure above, the properties of the disk inserted to the Slot 1 of the PCI module 10.

IMPORTANT:

The [RDR Utility] display is not updated automatically. Therefore, update it by clicking
[Refresh] from [Action] on the menu or pressing **F5** after performing operations to disk
such as inserting/removing a disk, specifying/removing the RDR setting.

Making disks duplex by RDR

The following describes the procedure to set duplex configuration to disks by RDR.
In this example, the disks of the Slot 1 of the PCI modules 10 and 11 are duplexed.

1. Insert a new disk to a built-in slot.
(In this example, a disk is inserted to the Slot 1 of the PCI module 10.)

2. From [Start], select [Control Panel] then
[Administrative Tools] and start [Computer
Management]. On the tree in the left pane,
click [Disk Management].
If the inserted disk is indicated as [Not
Initialized] in the right pane, right-click the
disk and initialize it.

IMPORTANT:

When a disk is inserted or initialized, a
popup window asking for rebooting the
system may be displayed, but there is no
need to reboot it. Select [No] and close
the popup window.

3. Start RDR Utility.

> **IMPORTANT:**
>
> ■ If the inserted disk does not appear on the tree, from the menu of RDR Utility, select [Action] and click [Refresh] or press **F5** to update the display after awhile.
>
> ■ The display of RDR Utility is not updated automatically. Therefore, update it every time after you perform disk operations described below.

4. On the left tree of RDR Utility, right-click a disk to set RDR and click [Create RDR Virtual Disk].

> **IMPORTANT:**
>
> Depending on the disk condition, RDR setting may take some time and RDR Utility may pause for a few minutes. There is no error, so wait until the process is completed.

IMPORTANT:

If RDR is specified to a disk which contains the system partition or partition which cannot be unmounted, the system restart pop-up message appears. If you click [Yes], the system is restarted in two minutes automatically. Go on to 5. when the system is restarted.

5. Insert a disk to set duplex configuration into the corresponding slot.
   (In this example, a disk is inserted into the Slot 1 of the PCI module 11.)

IMPORTANT:

■ When a disk is inserted, a popup window asking for rebooting the system may be displayed, but there is no need to reboot it. Select [No] and close the popup window.

■ For a disk to be inserted, use a new or physically formatted disk which has the same capacity as the synchronization source. If such a disk is not used, disks are not duplicated successfully.

■ As for 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] as [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.

6. On the left tree of RDR Utility, right-click a disk to set RDR and click [Add physical Disk To RDR Virtual Disk].

7. Confirm that synchronizing disks are started and the DISK ACCESS LEDs and the display of RDR utility change as shown below:

■   Synchronizing

	DISK ACCESS LED	RDR Utility	
		Op State: State	Status
Source disk	Amber (Blinking)	Simplex	
Destination disk	Amber (Blinking)	Syncing	
RDR Virtual Disk		Simplex	Resync x percent (x=0, 4, 8, ..., 96)

IMPORTANT:

When the partition does not exist on the disk, the DISK ACCESS LED is turned off on the source disk and the destination disk, and the status become Online.

IMPORTANT:

■ The time required for synchronization varies depending on the disk size.
For 73GB, it takes about 80 minutes.

■ If the system is rebooted during synchronization, the process cannot be completed. Do not restart the system until the synchronization is completed.

■ Synchronization completed

	DISK ACCESS LED	RDR Utility	
		Op State: State	Status
Source disk	Green (Blinking)	Duplex	
Destination disk	Green (Blinking)	Duplex	
RDR Virtual Disk		Duplex	None

IMPORTANT:

When the partition does not exist on the disk, the DISK ACCESS LED is turned off on the source disk and the destination disk, and the status become Online.

IMPORTANT:

■ When a new partition is created on the disk where RDR is configured, the created partition area is synchronized automatically.

■ When the system is halted without shutting down Windows properly, for example, by pressing the power button, the entire area of the synchronized disks will be resynchronized after the system is restarted.

Removing duplex configuration of RDR disks

This section describes how to remove duplex configuration from the disk with RDR setting.
In the example below, the duplication setting of the disks in the Slot 1 of the PCI modules 10 and 11 is removed.

IMPORTANT:

■ After executing the command, RDR settings will be cancelled but other data will remain.

■ Do not release the RDR setting of the system disk.

■ You cannot release the duplex setting of the dynamic disk.

■ The display of RDR Utility is not updated automatically. Therefore, update it every time you check the status of disks by clicking [Refresh] from [Action] on the menu or pressing **F5**.

1. Start the RDR Utility, right-click a disk you want to cancel RDR from the tree in the left pane, and select [Delete RDR configuration on Physical Disk].

2. Click [Yes].

3. Confirm that RDR of the disk is cancelled.

4. Cancel the disk of the corresponding slot in the same manner.

IMPORTANT:

- Cancelled disk may not be displayed properly on [Disk Management] after the RDR is cancelled. If this is the case, execute the following:
  1. Exit [Disk Management].
  2. Open [Computer Management] – [Service] and execute "Virtual Disk Service (vds)."
  3. Open [Disk Management].

- A partition on the disk where the RDR setting is removed is not assigned a drive letter. To use the partition, assign a drive letter using [Disk Management].
  However, under Windows 2008 environment, auto mount function of the OS assigns an arbitrary drive letter to the RDR-assigned drive. If you want to reassign the drive letter of the partition properly, use [Disk Management].

- If the disk contains a partition which cannot be unmounted, the OS needs to be restarted when canceling RDR.
  In that case, the system restart pop-up message appears. If you click [Yes], the OS is restarted automatically after two minutes:

Other functions of RDR Utility

<Commands for physical disks>

Remove Physical Disk From RDR Virtual Disk

All data including RDR settings on a physical disk can be deleted.

IMPORTANT:

- After executing the command, the physical disk becomes an empty basic disk without RDR settings.

- This command can only be executed to physical disks in Duplex/Syncing state.

---

1. Start RDR Utility and right-click a target disk on the tree in the left pane, and click [Remove Physical Disk from RDR Virtual Disk].

2. In the [Remove Physical Disk From RDR Virtual Disk] dialog box, click [Yes].

3. In the [Remove Physical Disk From RDR Virtual Disk] dialog box, click [OK].

Clear Hard MTBF

When a hardware failure occurs to a disk, the mean time between failures (MTBF) is counted and the value is saved. In RDR Utility, the value is displayed at [MTBF: HardCurrent] and [MTBF:HardNumberOfFaults].

These MTBF values can be cleared by the [Clear Hard MTBF] command.

1. Start RDR Utility and right-click a target disk on the tree in the left pane, and click [Clear Hard MTBF].

2. In the [Clear Hard MTBF] dialog box, click [OK].

Clear Soft MTBF

When a software failure occurs to a disk, the mean time between failures (MTBF) is counted and the value is saved. In RDR Utility, the value is displayed at [MTBF: SoftCurrent] and [MTBF:SoftNumberOfFaults].

These MTBF values can be cleared by the [Clear Soft MTBF] command.

1. Start RDR Utility and right-click a target disk on the tree in the left pane, and click [Clear Soft MTBF].

2. In the [Clear Soft MTBF] dialog box, click [OK].

Resynchronize This Physical Disk From RDR Virtual Disk

Disks whose synchronization by RDR is cancelled for reasons including a failure can be resynchronized.

1. Start RDR Utility and right-click a target disk in the left pane and click [Resynchronize This Physical Disk From RDR Virtual Disk].

2. In the [Resynchronize This Physical Disk From RDR Virtual Disk] dialog box, click [OK].

3. Confirm that the resynchronization starts and the status of disks changes as shown below:

■   Resynchronizing

	DISK ACCESS LED	RDR Utility	
		Op State: State	Status
Source disk	Amber (Blinking)	Simplex	
Destination disk	Amber (Blinking)	Syncing	
RDR Virtual Disk		Simplex	Resync x percent (x=0, 4, 8, ..., 96)

■   Synchronization completed

	DISK ACCESS LED	RDR Utility	
		Op State: State	Status
Source disk	Green (Blinking)	Duplex	
Destination disk	Green (Blinking)	Duplex	
RDR Virtual Disk		Duplex	None

Set As Active RDR Plex

A physical disk can be set as "Active RDR Plex" by a command.
Active RDR Plex is the disk on which data reading process is performed when Load Balancing of
RDR Virtual Disk is off.

1. Start RDR Utility and right-click a target disk in the left pane and click [Set As Active RDR
Disk].

2. In the [Set As Active RDR Plex] dialog box, click [OK].

Active RDR Plex can be viewed from [Active RDR Plex] of RDR Virtual Disk. (In the image below,
the disk in the slot 1 of PCI module 10 is set to Active RDR Plex among physical disks constructing
RDR Virtual Disk 2.)

Commands for RDR Virtual Disk

Verify RDR Virtual Disk

Whether the synchronization by RDR is performed normally can be checked.

1. Start RDR Utility and right-click [RDR Virtual Disk x] in the left pane and click [Verify RDR Virtual Disk].

2. In the [Verify RDR Virtual Disk] dialog box, click [OK].
The progress of verification can be viewed using RDR Utility.

	Verifying	Verification completed
[Status] of RDR Virtual Disk x	Verify x percent (x=0, 4, 8, …, 96)	None

TIPS:

- The verification process is automatically performed every 1 week.

- The time required for verification depends on the disk size and load.
For 73GB disk, it takes about 90 minutes.

Stop Verifying RDR Virtual Disk

Verification of RDR virtual disk in progress can be stopped.

1. Start RDR Utility and right-click [RDR Virtual Disk x] in the left pane and click [Stop Verify RDR Virtual Disk].

2. In the [Stop Verify RDR Virtual Disk] dialog box, click [OK].

Set Resync Priority

Priority of synchronization by RDR can be specified. By changing the priority, I/O load during synchronization can be reduced.

1. Start RDR Utility, right-click [RDR Virtual Disk x] in the left pane and click [Set Resync Priority].

2. When a dialog box appears, select Low, Normal or High (a default is Normal) and click [OK].

3. In the [Set Resync Priority] dialog box, click [OK].

Set RDR LUN Load Balancing

On or off of load balancing can be specified.
When the load balancing is on (default), the read process is performed alternately from two physical disks forming the RDR Virtual Disk to improve performance. When it is off, the read process is performed from the physical disk specified as Active RDR Plex.

1. Start RDR Utility, right-click [RDR Virtual Disk x] in the left pane to change the priority and click [Set RDR LUN Load Balancing].

2. When a dialog box appears, select On or Off (a default is On) and click [OK].

3. In the [Set RDR LUN Load Balancing] dialog box, click [OK].

Replacing Failed Hard Disk Drives

The following describes how to locate and replace the failed hard disk. The failed hard disk should be replaced with the server powered on.

How to Locate Failed Disks

1. From [Start], select [All Programs], [RDR] and click [RDR Utility] to start RDR Utility.

2. From the tree on the left pane of [RDR Utility], select each disk and check the values of [MTBF: Current] and [MTBF:NumberOfFaults] in the right pane.

[Description of each MTBF value]

Property name	Description	Normal value*
MTBF: HardCurrent	Mean time between hardware failures.	Unknown
MTBF: SoftCurrent	Mean time between software failures.	Unknown

* The normal value denotes the value of when no error has occurred.

If either of the values is different from the normal value, the disk has an error.

Procedures to Replace Failed Disks

This section describes a procedure for replacing a disk when a failure occurs to a disk that is duplicated by the RDR function.

IMPORTANT:

The display of RDR Utility is not updated automatically. Therefore, update it every time you check the status of disks by clicking [Refresh] from [Action] on the menu or pressing **F5.**
Do not update RDR Utility frequently immediately after inserting a disk.

Here, an example that a failure of the disk in slot 1 of the PCI module 10 is determined as described in "How to Locate Failed Disks" is explained.

1. From [Start], click [All Programs], point to [RDR], and select [RDR Utility] to start RDR Utility.

2. Remove the disk in the slot 1 of the PCI module 10.

Insert a new disk to the slot 1 of the PCI module 10.
Right-click on the inserted disk after inserting the disk and execute [Add Physical Disk To RDR Virtual Disk].

IMPORTANT:

- For a disk to be inserted, use a new or physically formatted disk which has the same capacity as the disk of the corresponding slot (in this example, the disk in slot 1 of the PCI module 10)

- When a disk is inserted, a popup window asking for rebooting the system may be displayed, but there is no need to reboot it. Select [No] and close the popup window.

- Insert the replacement disk after waiting for 15 seconds or more after removing a disk.

- When the disk is physically formatted and recycled, the inserted disk might be automatically set to RDR.

3. Confirm that the DISK ACCESS LEDs and the display of RDR Utility change as shown below:

- Synchronizing

	DISK ACCESS LED	RDR Utility	
		Op State: State	Status
Source disk	Amber (Blinking)	Simplex	
Destination disk	Amber (Blinking)	Syncing	
RDR Virtual Disk		Simplex	Resync x percent (x=0, 4, 8, ..., 96)

IMPORTANT:

- The time required for synchronization varies depending on the disk size.
  For 73GB disk, it takes about 80 minutes.

- If the system is rebooted during synchronization, the process cannot be completed. Do
  not restart the system until the synchronization is completed.

■   Synchronization completed

	DISK ACCESS LED	RDR Utility	
		Op State: State	Status
Source disk	Green (Blinking)	Duplex	
Destination disk	Green (Blinking)	Duplex	
RDR Virtual Disk		Duplex	None

CHANGE DRIVE LETTER

To add, change or delete drive letters, follow the steps below. Before making any changes, thoroughly read the NEC Express5800/ft series-specific precautions and general precautions for Windows.

1. Select [Start] - [Control Panel] - [Administrative Tools] and open [Computer Management].

2. In the console tree of [Computer Management], click [Disk Management].

3. Right-click a target partition, logical drive or volume and click [Change Drive Letter and Paths…].

4. Perform one of the following:

- To assign a drive letter, click [Add…], a drive letter to use, then [OK].

- To change a drive letter, click the drive letter to change, [Change…], a drive letter to use, then [OK].

- To delete a drive letter, click the drive letter to delete then [Remove].

IMPORTANT:

<NEC Express5800/ft series-specific precautions>

- When connecting an optional floppy disk drive, drive letters may change from A to B by switching CPU/IO modules. This does not affect the opearation of the server. Use B drive as the floppy disk drive.

<General precautions for Windows>

- Drive letter of system volume or boot volume cannot be changed.

- Up to 26 drive letters can be used on a computer. "A" and "B" are drive letters for floppy disk drives. Generally, hard disk drives are assigned "C" to "Z", but for network drives, drive letters are assigned in a reverse order ("Z" to "C").

- Because many of Windows programs refer to specific drive letters, cautions are required for assigning drive letters. For example, the Path environment variable specifies a program name and a specific drive letter.

- For performing the procedure above, you need to be a member of Backup Operators group or Administrators group, or you need to have appropriate authorization.

DUPLEX LAN CONFIGURATION

The NEC Express5800/ft series builds a duplex LAN configuration by using "Stratus emb-82576 2-Port Gigabit Adapter" mounted as standard on the CPU/IO module and the extended PCI slot "Stratus 82576 2-Port Copper Gigabit Adapter.".

Overview

The duplex LAN configuration is of three types as described below:

■ **Adapter Fault Tolerance (AFT)**

Adapter Fault Tolerance (AFT) is a feature that places more than one LAN controller on the same LAN (same segment), and automatically switches the process of the primary controller to the backup controller when any trouble occurred on the primary.

■ **Adaptive Load Balancing (ALB)**

Adaptive Load Balancing (ALB) is a feature that connects more than one LAN controller to the same hub and enhances the throughput by operating packet transmission from the server.

Receive Load Balancing (RLB) is enabled by default. Disable RLB. When RLB is enabled the network duplex configuration may fail.

The other modes, "Static Link Aggregation" and "IEEE 802.3ad Link Aggregation," do not contribute to enhancement against a fault. When a fault occurs, the communication performed on the controller with the fault is not taken over by the backup controller but lost.

Rules of Duplex Configuration on NEC Express5800/ft series

Ensure to make the setting of duplex network configuration on the server.

When building duplex configuration, be sure to use at least one adapter of CPU/IO module 0 and of 1 individually.

Example1) Configure the duplex network which enhances the service life by using all adapters.

Example 2) Configure the duplex network which corresponds to multiple LAN connection.

Configuring Duplex LAN

This section describes how to configure duplex LAN.

The following explains how to configure duplex/dual LAN regarding to the example shown in "Rules of Duplex Configuration on NEC Express5800/ft series".

IMPORTANT:
Log on as "Administrator" or a member of the group "Administrators."

1. Start [Device Manager].

2. Select a target Network Adapter. Right-click on it and select [Properties] from the menu displayed to show the properties dialog box.

3. Select the [Teaming] tab on the properties dialog box. Select the [Team with other adapters], and then click the [New Team…] button.

4. Enter the team name and click [Next].

5.   Select the adapters to include in the team and click [Next].

6.   Select [Adapter Fault Tolerance] or [Adaptive Load Balancing] as a team mode (Usually select [Adapter Fault Tolerance]).

Click [Next].

IMPORTANT:

When you connect the system to the network which configured spanning tree,   choose Adapter Fault Tolerant (AFT) as team mode and change the configuration as follows.
Don't use Switch Fault Tolerant.

Settings	Value/Property
Probes	Disable
Activation Delay	60sec

7. Click [Finish].

8. Start Command prompt to check the physical MAC address set on ipconfig/all.

9. Select the Team Adapter you have set. Right-click on it and select [Properties] from the menu displayed to show the properties dialog box.

10.   Select the [Advanced] tab on the properties dialog box. Select [Locally Administered Address] from the [Settings] list box, and then enter the MAC address of a Team Adapter, which you have checked, in the [Value] text box. Click [OK].

11.   Disable probe function when the team configured with only two adapters.
Select the [Advanced] tab in the Properties window. Select [Probe] from the [Settings] list box, and click [Properties] button. Probes dialog appears. Turn off the [Second Probes] in the dialog.
Click [OK] to close the dialog.

12. When you select Adaptive Load Balancing as a team mode, you need to disable Receive Load Balancing and delete the adapter priority.

− Select the [Advanced] tab on the properties dialog box. Select [Receive Load Balancing] from the [Settings:] list box, and then select [Disabled] from the [Value:] drop down list.

− Click [OK] to apply a change. The dialog will close.

− Show the properties dialog again.

On Windows Server 2008   On Windows Server 2003

− Select the [Settings] tab on the properties dialog box and click [Modify Team] button to display the dialog box.

− Select the adapter that the priority is set, and then press the [Remove Priority] button to remove the priority.

On Windows Server 2008   On Windows Server 2003

Removing Duplex/Dual LAN

This section describes how to remove duplex/dual LAN.

IMPORTANT:

Log on as "Administrator" or a member of the group "Administrators."

1. Start [Device Manager].

2. Select the Team Adapter of which you want to remove duplex/dual LAN. Right-click on it, and then select [Properties] from the menu displayed to show the properties dialog box.

3. Select the [Settings] tab in the properties dialog box and click the [Remove Team] button.

4. The confirmation dialog box appears. Click [Yes] button.

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 a PCI module using the ft server utility.
Select [Start] - [All Programs] - [NEC ESMPRO Agent] - [ft server utility] to start the ft server utility.
Then, from the ft server utility, select [PCI Module] and then the primary PCI module (*) from the [FTSever] tree on the left pane, and click [Down] of [Bring Up/Bring Down].

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

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

The following events or changes occur when stopping the primary PCI module and the module fails over:
■   The screen temporarily blacks out and then displayed again.
■   Indications of PCI modules' status LEDs change as follows:

[Indications of status LEDs]

	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	-

  * The primary and secondary modules after failover

4. Restart the PCI module.
From the ft server utility, click [Up] of [Bring Up/Bring Down] to the PCI module which was stopped in the step 3, and the PCI module will be started. Once the PCI module is started, PCI module diagnosis, mirror volume duplication and PCI module duplication are performed.

IMPORTANT:

If ARCserve Backup or Backup Exec is installed, the tape will not be recognized due to the failover of the PCI module. Thus be sure to stop the services before starting the PCI module.

1. Start [Services] from [Administrative Tools] of [Control Panel].
2. Select a service of backup software.
3. Choose "Stop" from the "Action" menu.
4. Repeat 2 and 3 for all services of the backup software.

The PCI modules' status LEDs changes as shown below:

[Indications of the 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:
* The status of LEDs varies depending on the method of disk duplication.

	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	PPRIMARY LED	-	Green
2	DISK ACCESS LED	Green blinking	Green blinking

	LED	System
3	System FT LED	Green

Confirm 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 ft server utility to stop the operation of a CPU module to remove.
From [Start], select [All Programs], [NEC ESMPRO Agent] then [ft server utility] to start the ft server utility. Then, from the ft server utility, select [CPU Module] then the CPU module to stop (*) from the [FTSever] tree on the left pane, and click [Down] of [Bring Up/Bring Down].

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

When you stop the operation of a CPU module, the indications of the status LEDs change as follows. Below denotes that the only one CPU module is operating.

[Indications of status LEDs]

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

LED		System
3	System FT LED	-

- As an example, the indications of when CPU module 0 is stopped are shown.

3. Press the start button of the CPU module stopped by ft server utility.
In the ft server utility, select the stopped CPU module and click [Up] of [Bring Up/Bring Down].
Once the CPU module is started, hardware diagnosis and then synchronization of memory (memory copy) are performed, and the duplication process is completed.
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 FT LED illuminates in green.

Do not perform the evaluation of start and stop unless the above process is completed.

NEC Express5800/ft series SERVICE PROGRAM CONFIGURATION

NEC Express5800/ft series achieves the duplex system using the following service programs, in addition to dedicated drivers.

Service program names shown in [Services]:
- ftSys eService
- ftSys Maintenance and Diagnostics (MAD)
- ftSys RPC Provider
- ftSys SSN
- Windows Management Instrumentation
- SNMP Service
- Alert Manager Main Service
- ESMFSService
- ESMCommonService
- ESRAS Utility Service
- ESMPS
- Virtual Disk Service (vds)
- DHCP Client

The above programs are necessary for the NEC Express5800/ft series operation. Do not stop these services.

When minimizing the number of operating service programs temporarily is required, the following service programs may be stopped:

Services that can be stopped:
- ESRAS Utility Service

Services required to keep operating
- ftSys eService
- ftSys Maintenance and Diagnostics (MAD)
- ftSys RPC Provider
- ftSys SSN
- Windows Management Instrumentation
- SNMP Service
- Alert Manager Main Service
- ESMFSService
- ESMCommonService
- ESMPS
- Virtual Disk Service (vds)
- DHCP Client

Make sure to restart the operations of stopped service programs immediately after the backup processes are completed.

TIPS:

- ftSys eService
      This service outputs SEL (System Event Log).

- ftSys Maintenance and Diagnostics (MAD)
      This service provides ft control management and diagnostics functions.

- ftSys RPC Provider
      This service manages WMI configuration and status.

- ftSys SSN
      This service controls communications between modules (when such as executing the Active Upgrade).

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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.

The server is configured with the correct parameters using the SETUP utility and shipped in the best conditions. Thus, you do not need to use the SETUP utility in most cases. However, you might wish to use the SETUP utility in the cases described below.

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

```
                              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
```

Options to be configured

Denotes there are submenus

Explanation of keys

Parameters
(selected parameters are highlighted)

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].

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	[Enabled] Disabled	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:

Under Wake On LAN environment
On the OS, go to [Start] - [Management Tool] - [Computer Management] and select the Device Manager. Double click [Stratus emb-EB 2-Port Gigabit Adapter #n] under the network adapter, then select the following option from [Power Management] tab:

Wake On Magic Packet from power off state
If Magic Packet corresponding to the MAC address of CPU/IO module on either side is issued, the system can be starated. However, the system can also be started even when one side of the CPU/IO modules fails if Magic Packet is issued for both CPU/IO modules.

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 Number	[443]	Set the TPC port number for the Management 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
```

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




    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).

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
 L 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
 L Enclosure        Direct Attach Devices_      Controller
   L 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
```

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.

Forced Shutdown

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.

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.

1. Os installation

If you select this item, the following confirmation screen appears.

After selecting **Yes** on the confirmation screen, the Top menu appears.

You can start up the OS install function, such as "ExpressSetup" from this menu. See User's Guide (setup) for details.

2. Tool menu

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

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 FD 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.

Autorun Menu

When the NEC EXPRESSBUILDER DVD is inserted into the optical disk drive, Windows automatically launches the menu as shown below.

This menu is used to:
- Read the User's Guide or the other documents,
- Update the server system (Windows drivers), and
- Install the management software.

NOTES:
- This menu requires Microsoft Windows XP, Vista or Windows Server 2003 (or later).

- This menu is not available for Microsoft Windows 2008 Server Core environment.

- Some documents are provided in PDF format. Use Adobe Reader to view or print these documents.

If the menu does not appear, eject the DVD from the disk drive once and insert it again.
If you want to execute the menu again after the menu ended, select "My computer" by the Explorer, and double-click the icon of the disk drive that contains the NEC EXPRESSBUILDER DVD.
Some menu items are grayed-out when the logon user does not have the authority of the administrator or the menu item is not available for your system.

To use the menu,
- Click on the menu items, or
- Click the right mouse button on the menu window.

PARAMETER FILE CREATOR

"Parameter File Creator" is a tool to create [Parameters file] that is used for configuring the server with the Express Setup (see Chapter 4 of the User's Guide (setup) for details).
If you use the Parameters file created by the Express Setup and Parameter File Creator to operate the setup, you can setup from the installation of OS to several utilities automatically except for a few key input to verify the specification. Also, you can install the system with the same specification as before when re-installing the system. We recommend you to create [Parameters file] to setup the servers from NEC EXPRESSBUILDER.

When using a floppy disk, a USB floppy disk drive is required.

IMPORTANT:

You can create [Parameters file] for Windows Server 2008 (x64), Windows Server 2003.

NOTE:

You can install Windows Server 2008 (x64) or Windows Server 2003 without [Parameters file]. Also, you can modify/newly create [Parameters file] during the setup with NEC EXPRESSBUILDER.

Parameter File Creator

This section describes about specifying setup information that is necessary for OS installation and creating [Parameters file].

Follow the procedure below.

NOTE:

Do not remove NEC EXPRESSBUILDER DVD from drive during Parameters file creation.

TIPS:

- ■   Parameter File Creator functions on the following OS.
  - – Windows Server 2008 (ensure to disable user account control (UAC))
  - – Windows Server 2003 x64 Editions, Windows Server 2003
  - – Windows Vista (ensure to disable user account control (UAC))
  - – Windows XP x64 Edition, Windows XP

---

1. Start the OS.

2. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive.

3. Right-click on the screen or left-click [Setup Windows]. The menu will appear.

4. Click [Parameter File Creator].

Parameter File Creator will appear.

5.   [Load parameters] step is displayed.
Select [Do not load parameters] from the menu, click [Next].

6.   Select the installing Operating System.
Select [Install the Windows(32bit editions)] or [Install the Windows(64bit editions)] from the menu, click [Next].

7. Enter the setting of a logical drive.
[Enter RAID setting] steps are displayed. Retain the default value,
and click [Next].

8. Specify the installing medium and the Windows system partition.
[Specify medium/Partition] steps are displayed. Confirm the parameters, modify if
necessary, and then click [Next].

[Windows Server 2008]

[Windows Server 2003]

NOTE:

If you want to apply the service pack, do so after applying the Windows Server 2003 R2 DISC 2.

About partition size

- Specify the partition size larger than the required minimum size for OS installation.

- Do not specify a larger partition size than the capacity of connected hard disk drive.

- If you select "Create a new partition" at "Windows system drive settings," the contents of the hard disk will be all deleted.

- If "Use existing partitions" is selected, NEC EXPRESSBUILDER install the Operating System to the 1st partition (1st partition is deleted). The data in the other partition is kept if the system has two or more partitions. (See the figure below.)

First Partition Deleted	Second Partition Retained	Third Partition Retained

- You can not re-install the system with the existing partition that is upgraded to Dynamic Disk remained. Do not select "Use existing partitions" at "Windows system drive settings."

9. Enter the user information and client license mode.

[Enter basic parameters] steps are displayed. Verify the parameters, modify if necessary, and then click [Next].

[Windows Server 2008]

[Windows Server 2003]

IMPORTANT:

- Computer name and user name are required for Windows Server 2003.
- Computer name and Administrator password that meets the following conditions are required for Windows Server 2008.

  – 6 or more characters by one-byte

  – Three of the followings are included: Number/One-byte capital letter/One-byte lower case letter/Symbol

TIPS:

- If you load parameter file, or go back from **Step 6** or later to **Step 5**, [●●●●●●] is displayed in **Administrator password** and **Confirm password** even if you do not enter the value.

- User name is fixed to **Administrator** for Windows Server 2008.

10. Enter the setting of the network protocol.

[Enter network protocol] steps are displayed. Retain the default value, and click [Next].

11.   Enter the domain or workgroup name to be used.

[Enter domain account] steps are displayed. Retain the default value, and click [Next].

12.   Enter the installing components.

[Select Windows components] steps are displayed. Verify the parameters, modify if necessary, and then click [Next].

[Windows Server 2008]

[Windows Server 2003]

13. Select the installing applications.

[Select applications] steps are displayed. Retain the default value, and click [Next].

14. Save the parameters.

[Save parameters] steps are displayed.

If you want to save the parameters, set the free formatted floppy disk.

Select [Save parameters], enter the file path of the Parameters file into the text box and click [Next].

If not, select [Do not save parameters].

15. Save to a floppy disk.

The floppy disk containing the Parameters file has been created.

Click [Yes] to exit Parameter File Creator.

NOTE:

– If you modify existing information file (Parameters file), click "Load parameters" at [Load parameters] screen. Refer to help to modify information file.

– If you cancel operation on the way, click ✕ at the upper-right corner of the screen.

NEC ESMPRO Agent and Manager

NEC Express5800/ft series system management applications "NEC ESMPRO Manager" and "NEC ESMPRO Agent" are bundled to accessory "NEC EXPRESSBUILDER DVD."

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 increase in the chassis temperature and 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 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 • CPU degrading, etc.
Voltage	Voltage lowering
Temperature	Temperature increase in chassis, etc.
Fan	Fan failure (decrease in the number of revolutions), etc.
Storage	File system usage rate, etc.
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, CPU, fans, power supply, and temperature.

Functional availability on the DataViewer

Function name		Availability	Function outline
Hardware		Available	This function shows the hardware's physical information.
	Memory bank	Available	This function shows the memory's physical information.
	Device information	Available	This function shows the device's unique information.
	CPU	Available	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		Available	This function monitors temperature, fan, voltage, power supply and door.
	Temperature	Available	This function monitors temperature inside of chassis.
	Fan	Available	This function monitors fan.
	Voltage	Available	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		Available	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 fault report function can notify the system Administrator of the occurrence of the fault. In addition, the DataViewer of NEC ESMPRO Manager can monitor the system status and also identify the failed component.

NEC ESMPRO provides several maintenance functions such as the update of F/W and BIOS in the NEC Express5800/ft series in the online state (in which the system continues the operation but the components used to update F/W or BIOS is suspended) and the suspension of a specific 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	–	NEC ESMPRO Manager DataViewer
Diagnosis and start/stop of major components and F/W update	NEC ESMPRO Agent ft server utility	NEC ESMPRO Manager DataViewer
Verification of alert or verification of fault occurrence event information	Event Viewer	NEC ESMPRO Manager AlertViewer

* When the administration manager is also the managed NEC Express5800/ft series (or NEC ESMPRO Manager is installed on the managed NEC Express5800/ft series), all functions of the administration manager can be used on the managed NEC Express5800/ft series.

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.

Device name	Device ID
CPU module 0	0
DIMM SLOT 1 on CPU module 0	0/1
DIMM SLOT 2 on CPU module 0	0/2
DIMM SLOT 3 on CPU module 0	0/3
DIMM SLOT 4 on CPU module 0	0/4
DIMM SLOT 5 on CPU module 0	0/5
DIMM SLOT 6 on CPU module 0	0/6
DIMM SLOT 7 on CPU module 0	0/7
DIMM SLOT 8 on CPU module 0	0/8
DIMM SLOT 9 on CPU module 0	0/9
DIMM SLOT 10 on CPU module 0	0/10
DIMM SLOT 11 on CPU module 0	0/11
DIMM SLOT 12 on CPU module 0	0/12
CPU1 on CPU module 0	0/21
CPU2 on CPU module 0	0/22
CPU module 1	1
DIMM SLOT 1 on CPU module 1	1/1
DIMM SLOT 2 on CPU module 1	1/2
DIMM SLOT 3 on CPU module 1	1/3
DIMM SLOT 4 on CPU module 1	1/4
DIMM SLOT 5 on CPU module 1	1/5
DIMM SLOT 6 on CPU module 1	1/6
DIMM SLOT 7 on CPU module 1	1/7
DIMM SLOT 8 on CPU module 1	1/8
DIMM SLOT 9 on CPU module 1	1/9
DIMM SLOT 10 on CPU module 1	1/10
DIMM SLOT 11 on CPU module 1	1/11
DIMM SLOT 12 on CPU module 1	1/12
CPU1 on CPU module 1	1/21
CPU2 on CPU module 1	1/22
PCI module 0	10
PCI slot 1 on PCI module 0	10/6
PCI slot 2 on PCI module 0	10/8
PCI slot 3 on PCI module 0	10/7
Ethernet1 on PCI module 0	10/2
PCI module 1	11
PCI slot 1 on PCI module 1	11/6
PCI slot 2 on PCI module 1	11/8
PCI slot 3 on PCI module 1	11/7
Ethernet1 on PCI module 1	11/2
SCSI enclosure 0	10/40
SCSI slot 1 on SCSI enclosure 0	10/40/1
SCSI slot 2 on SCSI enclosure 0	10/40/2
SCSI slot 3 on SCSI enclosure 0	10/40/3
SCSI enclosure 1	11/40
SCSI slot 1 on SCSI enclosure 1	11/40/1
SCSI slot 2 on SCSI enclosure 1	11/40/2
SCSI slot 3 on SCSI enclosure 1	11/40/3

* "SCSI" includes SAS.

Supplement

Note the followings when using NEC ESMPRO Agent.

Application log registered when system starting

■ About the event of "Source: Perflib"
When system is starting, Perflib log may be registered to the application log.

The detailed information about an event log is described on Microsoft Product Support Services. Please check the contents.

– [INFO] Events for Performance Monitor Extensions
http://support.microsoft.com/default.aspx?scid=kb;en-us;226494

– Application Log Events Generated When You Start Performance Counter Query
http://support.microsoft.com/default.aspx?scid=kb;en-us;296187

– Event ID 2003 Warning Message Logged When Loading Performance Counters
http://support.microsoft.com/default.aspx?scid=kb;en-us;267831

Visit the Microsoft Help and Support on regular basis where you can find other information than the above at http://support.microsoft.com/default.aspx?LN=en-us.

Maintenance-related Functions

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

CPU Information

If you select [CPU Module] – [CPU] in the [ft] tree of the DataViewer, unknown or incorrect information appears in some information items.

The CPU information can be viewed by selecting [System] – [CPU] in the [ESMPRO] tree.

Change of Installation States of CPU and PCI Modules

If you dynamically change the configuration of the CPU or PCI module in the relevant system during review of the server information by using the DataViewer, the message prompting you to reconstruct the tree of the DataViewer will appear. If you click the [Yes] button, the tree is reconstructed in the DataViewer to reflect the change of the system configuration on the DataViewer. Clicking the [No] button does not cause the tree to be reconstructed in the DataViewer. If so, the information in the DataViewer may be different from the current system information because the change of the system configuration is not reflected on the DataViewer.

SCSI Slot Information

When the PCI module is detached and you select [SCSI Slot] – [General], the displayed "Hardware LED" information may not be correct.

To check the status of SCSI slots, see the string information in the "Status" column.

Impact When Module Status Changes

PCI modules, SCSI adapters, SCSI buses, and modules under the SCSI enclosure have impact on each other. For example, when the "Status" item of a module changes to "fault," it may be caused by another module's error. Therefore, you need to check the status of the other modules based on alert information.

Status Color after Mounting a Hard Disk Drive

When creating a new mirror, the status of the hard disk and its upper component, SCSI enclosure, will continue to change frequently after you mount a hard disk until the mirror is completed. During this process, the status color may turn to abnormal, but when the mirror is created successfully, it will return normal.

Total Status of the PCI Module

When each module's status is simplex, the total status of the PCI module displayed on the DataViewer is yellow (warning) and the status will be reflected to the server status. The ft control software 3.0 or later does not display the information on Ethernet or SCSI adapter on the tree of the DataViewer. If an error occurs on an Ethernet or SCSI adapter, view the alert reports.

Hard Disk Drives Mirrored by the Rapid Disk Resync (RDR) Function

The DataViewer's [Mirror Disk] tree of [ft] shows a pair of hard disk drives constructing mirroring as one mirror. Therefore the status of a volume (such as span volume and striping volume) over multiple hard disk drives created by the RDR function may not be displayed correctly. Use the RDR Utility for checking the state of mirrored hard disk drives created by the RDR function.

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.

Community Authority

Depending on your OS type or its version, settings for community, SNMP service's security function, are not made, or default settings of authority are different.

To enable the remote shutdown and threshold change functions via NEC ESMPRO Manager, make settings of community and set its authority to "READ CREATE" or "READ WRITE."

Hardware Monitoring by ESMPRO

In NEC Express5800/R320a-E4/M4, an alert report is not issued if an error on power supply is detected in CPU module and PCI module.

Moreover, the trees [Power Supply] is not displayed on [System Environment] of DataViewer of NEC ESMPRO Manager.

As the characteristic of ft server, there are cases that recovery events of temperature, fan and electric voltage may not occur when CPU/IO module is isolated.However, you can confirm the recovery by checking the sensor status.

If the already installed CPU/IO module is isolated, the sensor status is displayed as normal, and the sensor status is reacquired when CPU/IO module is mounted again.

System Environment Monitoring

On NEC Express5800/320Fd-MR, monitoring of temperature, fan and voltage under [System Environment] of [ESMPRO] tree in the DataViewer is set to enable and cannot be changed to disable by default.

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. Double-click the [NEC ESMPRO Agent] icon in [Control Panel].

2. Select a desired community name from the [SNMP Community] list box in [SNMP Setting] of the [General] sheet.

   The community names to receive SNMP packets from are listed in the [SNMP Community] list box.

3. Click [OK] to terminate the operation.

Printer Information's Available Time:

When you add a new printer, install its driver and make its settings, if you do not make settings for the available time from Add Printer Wizard, the printer's available time (From and To) in [Printers and Faxes] are [00:00], on the other hand, Manager's time are [9:00]. To display them properly, make the settings of printer from [Printers and Faxes]. The procedures are as follows;

1. Start [Printers and Faxes], and open the printer properties you want to make settings for. (Select the [Printers and Faxes], right-click and select [Properties].)

2. Select the [Advanced] tab.

3. Enter values in the available time (From and To), and click [OK] in the [Advanced] and [Properties] dialog boxes.

Now, you can see the correct information from Manager, too.

Disk Maintenance while NEC ESMPRO Agent is Running

The following works to disks (hard disk drive or magneto optical) are not allowed while NEC ESMPRO Agent is running;

To format or delete a partition by Disk Administrator or by other means.

To request programmatically to remove media from removable disks such as MO, Zip and PD.

1. Select the [Start] – [Settings] – [Control Panel]

2. Open the [Service]

3. Select a service named "ESMCommonService," and click the [Stop].

4. Verify that "ESMCommonService" stopped, and close the [Service].

5. Do the disk-related works.

6. Open the [Service] again, select "ESMCommonService" and click the [Start].

7. Verify that "ESMCommonService" is active and close the [Service] and [Control Panel].

Connection with Hard Disk Drive

The preventive hard disk drive maintenance function may not work properly when a hard disk drive which was used in a system where NEC ESMPRO Agent is installed is connected to other systems. Make sure not to connect such hard disk drives.

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.

CPU Load Ratio of SNMP Service (snmp.exe)

While monitoring the server from NEC ESMPRO Manager, the CPU load ratio of SNMP 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 SNMP 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 SNMP 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 SNMP Service

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

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

Pop-up message of esmcmn.exe is displayed when starting the system:

The following pop-up message may be displayed when you restart the system which NEC ESMPRO Agent is installed to and removal drives such as MO and DVD-RAM are mounted on, without closing Windows Explorer, after displaying the contents of media and removing the media by the software eject (by right-clicking the DVD drive on Windows Explorer and selecting [Eject]) The message (the drive name) displayed varies depending on the systems.
If the pop-up message "There is no disk in the drive. Please insert a disk into drive A:." is displayed, click [Cancel] or [Continue] to close the dialog box. If you do not close the dialog box, you cannot start the Workstation service and related services, causing unstable operation of the system. Also, if you restart the system, execute it after terminating the program such as Windows Explorer which displays a media.

Example

CPU Information

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

When [ft] Tree Appears on Date Viewer in an Incorrect Manner

If you open a DataViewer immediately after the system starts up, the tree or the state of a DataViewer may not be displayed correctly due to high load of the system. In about 20 minutes after the system startup, when a pop-up message (below) which prompts you to reconstruct a DataViewer appears, click [OK]. The DataViewer will be reconstructed and the tree and the status will be displayed correctly.

DataViewer

The system configuration of the host may have been changed. Do you wish to reconstruct the tree?

Floppy Disk Drive Name

After unplugging and plugging the PCI module of the primary side, the floppy disk drive name of [I/O Device] on DataViewer may be different from the name that is recognized by the OS.

(Example: drive name on DataViewer: "A"
drive name recognized by the OS: "B")

Check the floppy disk drive name on Explorer.

Floppy Disk Drive Information

If you add or delete floppy disk drive connected with USB while the system is running, the drive information under the [I/O Device] in the DataViewer will be updated at the next system startup.

Information of the keyboard/mouse connected with USB

When the keyboard or mouse is connected with USB, the keyboard or mouse information under the [I/O Device] in the DataViewer is listed as "Unknown."

Ethernet Adapters You Do Not Use

If an Ethernet adapter is not used (not connected to cable), set it to "Disable" in [Network Connections] from Control Panel. If an Ethernet adapter you are about to disable has dual LAN settings (AFT function), remove the dual LAN settings before disable it.

DataViewer display when only one of the PCI modules (IO modules) is operating

When only one of the PCI modules (IO modules) is operating (non-dual configuration), the SCSI enclosure or mirror disk status cannot be displayed normally.

To check if the dual configuration is changed to the simplex operation mode, check the event log, AlertViewer log, or the status color of PCI module of DataViewer.

Display of Ethernet Board of ftServer Utility

FtServer Utility displays the information of Network Controller.
Express5800/320Fd-LR/MR has four in-built Network Ports. Two trees of the Ethernet Board are displayed since a module has two Network Controllers.

Ethernet board status on ftServer Utility

Physical Network Controller status appears on the right pane of the Ethernet Board (10/2),(11/2) under ftServer Utility [ftServer] - [PCI Module] - [PCI Module(ID:10),(ID11)].Thus, the status shows "Online" as long as the Network Controller is normal regardless of whether or not LAN cable is connected.

Additionally, if duplication of LAN cable is completed properly on implementing an optional Ethernet Board, each status shows "Duplex" on the right pane of the optional Ethernet Board. However, when duplication is performed improperly and one side of CPU/IO module LAN cable is disconnected, the status of the disconnected optional Ethernet Board shows "Online". The other side of the optional Ethernet Board status shows "Simplex".

Example: The status shows as below when you connect all the LAN cables to the CPU/IO modules and duplication is performed properly.

PCI module (ID:10)
 +Ethernet (10/2)   Status: Online
 +Ethernet (10/6)   Status: Duplex
 +Ethernet (10/7)   Status: Duplex
 +Ethernet (10/8)   Status: Duplex
PCI module (ID:11)
 + Ethernet (11/2)   Status: Online
 + Ethernet (11/6)   Status: Duplex
 + Ethernet (11/7)   Status: Duplex
 + Ethernet (11/8)   Status: Duplex

Example: The status shows as below when LAN cable of CPU/IO module (ID:10) is disconnected.

PCI module(ID:10)
 + Ethernet (10/2)   Status: Online
 + Ethernet (10/6)   Status: Online
 + Ethernet (10/7)   Status: Online
 + Ethernet (10/8)   Status: Online
PCI module(ID:11)
 + Ethernet (11/2)   Status: Online
 + Ethernet (11/6)   Status: Simplex
 + Ethernet (11/7)   Status: Simplex
 + Ethernet (11/8)   Status: Simplex

Community Authority

Depending on your OS type or its version, settings for community, SNMP service's security function, are not made, or default settings of authority are different.
To enable the remote shutdown and threshold change functions via NEC ESMPRO Manager, make settings of community and set its authority to "READ CREATE" or "READ WRITE".

The monitoring event is not alerted

- The alert function is based on the event information registered in the event log of the system. Thus, set the event log process on the event viewer to [Overwrite events as needed]. The monitoring event is not alerted in the setting other than that.

- The event registered in the monitoring event tree on the setting tool of alert function (Alert Manager) is not alerted to the manager if Alert Manager Main Service does not operate. Even when the service is operating, if the enabled/disabled flag of each alerting ways is disabled, the event is not alerted.

  The alert enabled/disabled flag is set by selecting [Base Setting] – [Report] Properties from [Setting] of Alert Manager. Also the event occurred before Eventlog Service started at the time of system startup cannot be alerted.

- You can set the time to the shutdown by selecting [Base Setting] – [Other] on the setting tool of the alert function (Alert Manager). The initial value is 20 seconds.
  When you set smaller value than this, the alert may not be performed at the time of shutdown.

- When an alert failure occurs at the time of alerting of monitoring target event, an error message is logged in the event log. If you newly log the error message which occurs at the time of alerting as a monitoring target event, the error at the time of alerting will be alerted again. As a result, large number of alerts will be sent when recovering the failure. This leads to the increase of system load and the degradation of the performance. Do not register the events especially which are produced by the following alert function services as the monitoring target.

  Alert Manager ALIVE(S) Service
  Alert Manager Main Service
  Alert Manager Socket(S) Service

- On Manager Alert (SNMP) in alert report function, the length of messages should be up to 511 bytes. When reporting a message with the length longer than 512 bytes, the 512th and the later message do not appear on the alert viewer. Check the 512th and the later message on the event viewer on the machine that sends the report.
  If you want to display all the messages later than the 512th, use Manager Alert (TCP/IP In-Band).

The detail information of alert is displayed as "Unknown"

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

Event log which warn CPU load monitoring is registered

If NEC ESMPRO Agent cannot acquire performance information from the OS due to a temporary resource shortage or high load ratio on the system, it will record the following event log. However, there is no real problem on operation. (In the description, Y and X represent alphanumeric characters.)

Source: ESMCpuPerf
Type: Information
Event ID: 9005
Description: Cannot get system performance information now (YYYY Code=xxxx).

If NEC ESMPRO Agent cannot get information, it will treat the load ratio as 0%.
Therefore, if NEC ESMPRO Agent cannot get information continuously, the CPU load ratio may appear lower than the actual value.

Monitoring the failures of the tape device is desired

NEC ESMPRO Agent does not monitor the failures of the tape device. If you want to conduct monitoring, use backup software or tape monitoring application. Using the event monitoring function of NEC ESMPRO Agent allows you to monitor the event log of backup software or applications.

File system monitoring cannot be inherited on the system using NECEXPRESSCLUSTER

When using NEC ESMPRO Agent in the cluster environment configured by NEC EXPRESSCLUSTER, there is a 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.

Network drive is not displayed in the DataViewer

On WindowsXP or the OS released after it, the drive connected to network is not displayed under the file system tree in the DataViewer of NEC ESMPRO Manager.

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.

Temperature/voltage error occurs on the CPU/PCI modules

At the time when a temperature or voltage error occurs on CPU/PCI module
(CPU/IO module), necessary actions will differ depending on their status as
shown below. You can check the status of each module from the DataViewer of NEC ESMPRO
Manager or ftServer Utility.

Status	Operation
Duplex	Stop the failed CPU/PCI module (CPU/IO module).
Simplex	Shut down the system.

-   If the status is "Empty", the module is not mounted. Sensor monitoring is not conducted.

-   If disks are mounted on PCI modules (IO modules), the status of both modules is "Simplex"
    while the disks are mirrored. Temperature or voltage error occurring during disk mirroring will
    result in the system to shut down.

I/O device information on the Multi monitor system

If you use the multi monitor system with the additional graphic accelerator board, the information
of the only monitor 1 is displayed on the I/O device view of the DataViewer.

Refresh rate of display adaptor

If you selected [use default setting of hardware], the value of the refresh rate is '1Hz' under
[I/O Device] - [Display adapter name] on DataViewer.

-   The setting of the screen refresh rate can be confirmed by [Properties] on the screen.
    ([Setting] tab - [Advanced] - [Monitor] tab - [Screen refresh rate])

-   It is set to the use of a default setting of hardware by the refresh rate of the screen when
    the monitor name is displayed as 'Generic PNP Monitor'.

Display of ft server utility

It is correct under the control of CPU module, the PCI module, and SCSI Enclosure because it is
not constructed and may not be able to display data immediately after the system starts.

If the display is not corrected after a while, the fault-tolerant server utility is reactivated.

New event on Windows Server 2008

The event log monitoring function does not monitor some events that are added on the Windows
Server 2008.
NEC ESMPRO Agent does not report these events, such as "BugCheck".

Chipset Information

"Unknown" is displayed as the type of the chipset information in the [ft]-[CPU Module]-[General] view of the DataViewer (It is blank in the Web Component).

DIMM Information

"Unknown" is displayed as the memory type in the [ft]-[CPU Module]-[DIMM] view of the DataViewer (It is blank in the Web Component).

NEC ESMPRO Manager

To monitor and manage a computer, on which NEC ESMPRO Agent is installed, with a management PC online, use NEC ESMPRO Manager that is bundled with the product.

For detailed procedures of installation and setting, see online documents or NEC ESMPRO Online Help.

TIPS:

- Online documents provide cautions and information for using NEC ESMPRO Manager. See *NEC ESMPRO Manager User's Guide* in the NEC EXPRESSBUILDER DVD.

- The sample screen shown in this subsection may differ from that of your server software; however, it offers the same function.

Monitoring by Use of DataViewer

To monitor the state of the NEC Express5800/ft series on a management computer with installation of NEC ESMPRO Manager, the DataViewer is used. If you click each of the modules and items to be checked sequentially on the tree view in the Windows Explorer format, the DataViewer indicates their states on the right side of the screen.

You can manage the status on a Web browser using Web component functions of NEC ESMPRO Manager. For details, see Help on Web Component.

This section describes the tree structure and displayed screens in the DataViewer.

To make the DataViewer indicate the state of each module and those of the components on it, select the server to be monitored from NEC ESMPRO Manager to start the DataViewer (in the following description, the start procedure of the DataViewer is omitted).

Monitoring CPU Module

To monitor the CPU modules and the components on the CPU module, see the [CPU Module] tree. To see the information on the [CPU Module] tree, select the target CPU module from [CPU Module] in the [ft] tree.

You can see the following information on the modules and the components on the CPU modules in the [CPU Module] tree.

- General

  Allows the configuration and other information on the CPU modules to be viewed.

- Maintenance

  Allows the start/stop, MTBF information clear, dump acquisition, and diagnosis of the CPU modules to be provided. See "Maintenance of NEC Express5800/ft series" described later for the start/stop and MTBF information clear of the CPU modules.

■ Update

Allows the device identification information of the CPU modules to be viewed and BIOS of the CPU modules to be updated. See "Maintenance of NEC Express5800/ft series" described later for the update of BIOS of the CPU modules. The detailed device identification information can be checked by selecting [ESMPRO] tree→[Hardware] tree→[Field Replaceable Unit] tree.

■ CPU

Allows the information of the CPU on the CPU modules to be viewed.

■ DIMM

Allows the information of DIMM on the CPU modules to be viewed.

Monitoring PCI Module

To monitor the PCI modules and the components on the PCI modules, refer to the [PCI Module] tree. To see the information on the [PCI Module] tree, select the target PCI module from [PCI Module] in the [ft] tree.

You can see the following information on the PCI modules and the components on the PCI modules of the [PCI Module] tree.

(This section describes the general information screens of the PCI modules. The components on the PCI modules are described later.)

■ General
    Allows the configuration and other information of the PCI modules to be viewed.

■ Maintenance

Allows the start/stop, MTBF information clear, and diagnosis of the PCI modules to be provided. See "Maintenance of NEC Express5800/ft series" described later for the start/stop and MTBF information clear of the CPU modules.

■ Update

Allows the device identification information of the PCI modules to be viewed. The detailed device identification information can be checked by selecting

[ESMPRO] tree→[Hardware]→[Field Replaceable Unit].

Monitoring PCI Slots and Devices on PCI Module

To monitor the PCI slots and devices on the PCI modules, see the [PCI slot] tree. To see the information on the [PCI slot] tree, select [PCI Module]→[PCI module (containing PCI slot to be seen)]→[PCI slot] of the [ft] tree.

You can see the following information on the PCI slot and the devices on the PCI slot in the [PCI slot] tree.

- General

  Allows the PCI slot configuration information to be viewed.

- Maintenance

  Allows a device on the PCI slot to be started. This function is not supported in the current version.

- PCI Device – General

  Allows the information of devices on the PCI slot to be viewed.
  This function is not supported in the current version.

- PCI Device – Detail

  Allows the detailed information of a device on the PCI slot to be viewed.
  This function is not supported in the current version.

- PCI Bridge – General

  Allows the information of bridges on the PCI bus to be viewed.
  This function is not supported in the current version.

- PCI Bridge – Bus

  Allows the bus information of a bridge on the PCI bus to be viewed.
  This function is not supported in the current version.

- PCI Bridge – Detail

  Allows the detailed information of a bridge on the PCI bus to be viewed.
  This function is not supported in the current version.

Monitoring SCSI adapter on PCI module

To monitor the SCSI adapters on the PCI modules, see the [SCSI adapter] tree. To see the information on the [SCSI adapter] tree, select [PCI Module]→[PCI module (connected to SCSI adapter to be seen)]→[SCSI adapter] of the [ft] tree.

You can see the following information on the SCSI adapters in the [SCSI adapter] tree. This function is not supported in the current version.

- General

  Allows the SCSI configuration information to be viewed. This function is not supported in the current version.

- Maintenance

  Allows the MTBF information of SCSI adapters to be viewed and cleared. This function is not supported in the current version.

- Update

  Allows the firmware of SCSI adapters to be updated. This function is not supported in the current version.

- SCSI bus

  Allows the information on the SCSI bus connected to SCSI adapters and devices to be viewed. This function is not supported in the current version.

Monitoring Ethernet adapter on PCI module

To monitor the Ethernet adapters on the PCI modules, see the [Ethernet Board] tree. To see the information on the [Ethernet Board] tree, select [PCI Module]→[PCI module (connected to the Ethernet adapter to be seen)]→[Ethernet Board] of the [ft] tree. You can see the following information on the Ethernet adapters in the [Ethernet Board] tree.

IMPORTANT:

Disable the unused Ethernet adapter (that is not connected to cables) by using [Network Connection] in Control Panel. However, if the Ethernet adapter to be disabled is set to dual LAN configuration (AFT feature), disable it after removing dual LAN configuration. If it is not disabled and the cable is not connected to it, NEC ESMPRO Agent determines that the port is faulty (does not have any media), and the status color of [ft] - [PCI module] - [Ethernet Board] of the DataViewer turns red (abnormal). The server status color of the integrated viewer also turns red (abnormal).

- General

  This function is not supported in the current version.

- Detail

  This function is not supported in the current version.

- Maintenance

  This function is not supported in the current version.

Monitoring SCSI Enclosure

To monitor the SCSI enclosure, see the [SCSI enclosure] tree. To see the information on the [SCSI enclosure] tree, select [SCSI enclosure] of the [ft] tree.

You can see the following information of the SCSI enclosure from the [SCSI enclosure] tree.

■ General

Allows the configuration and other information of the SCSI enclosure to be viewed.

> **IMPORTANT:** You need to be aware that PCI modules, SCSI adapters, SCSI buses, and modules under the SCSI enclosure have impact on each other. For details, see "Impact When Module Status Changes" described above.

■ Maintenance

Allows the MTBF information of the SCSI enclosure to be viewed or cleared.

This function is not supported in the current version.

■ Update

Allows the firmware of the SCSI enclosure to be updated.

However, this function is not supported in the current version.

■ Electronics – General

This function is not supported in the current version.

■ Electronics – Maintenance

This function is not supported in the current version.

■ SCSI Slot – General

Allows the configuration and other information of the SCSI slot to be viewed.

> **IMPORTANT:** You need to be aware of the status of hard disk during the mirror creation. For details, see "Status Color Changes after Hard Disk Drive is Mounted" described earlier in this chapter.

■ SCSI Slot – Maintenance

Allows the MTBF information of the SCSI slot to be viewed or cleared.
This function is not supported in the current version.

Monitoring Mirror Disk

To monitor the mirror disk components, see the [Mirror Disk] tree. To view information on [Mirror Disk] tree, select [Mirror Disk] under [ft] tree.

You can see the redundancy status of the mirrors and the device IDs of the SCSI slots into which these hard disk components are connected.

[Mirror Disk]

Monitoring Hard Disk Drive (HDD)

To monitor the hard disks and detect disk failures at an early stage, use the NEC ESMPRO Manager and NEC ESMPRO Agent. You can see configurations and information of hard disk in the DataViewer.

Monitoring HDD Operations

This section describes how to maintain hard disk drives.

1. Verification of HDD failure

    If NEC ESMPRO Agent detects some problem with a HDD, it will report an alert of the problem to NEC ESMPRO Manager. Please check the AlertViewer in the manager regularly.

    Ex. If a HDD in SCSI Slot (10/40/1) is broken, NEC ESMPRO Agent reports the following alert.

    > Device 10/40/1 is now BROKEN.

    And manager displays the problem information of the hard disk in the [SCSI enclosure] → [SCSI Slot] → [General] of the DataViewer.

[SCSI Slot] → [General]

2. Verification of mirror status

To check the redundancy status of the failed mirror disk, open [Mirror Disk] screen under [ft]. On this screen, you can check the redundancy status of the mirror and the status of the mirrored hard disks.

[Mirror Disk]

IMPORTANT: The mirroring redundancy status will change depending on the status of the two hard disks that make up a mirror as follows:

Status of hard disk drive 1	Status of hard disk drive 2	Status of mirror volume
Duplex	Duplex	Normal
	Simplex	–
	Others	Warning
Simplex	Duplex	–
	Simplex	Normal
	Others	Warning
Others	Duplex	Warning
	Simplex	Warning
	Others	–

"–": No status is shown.

TIPS: Unless the hard disks make up a mirror, the Mirror Disk screen does not show any information.

IMPORTANT: The Mirror Disk screen shows a pair of hard disks constructing mirroring as a mirror. Note that when multiple volumes are created in these hard disks, the information on the volumes will not be displayed.

If multiple volumes are created within a single disk:

The screen shows information on a pair of hard disks that make up a mirror.
It does not show information based on volumes (ex. Volume A, Volume B).

3. Recovery from a hard disk failure

If a hard disk breaks, the broken disk must be replaced immediately. This section describes alert reports and status shown by the DataViewer while disks are replaced to restore mirroring.

(1) Detecting problem of a hard disk

See [1. Verify of hard disk failure] above.

(2) Removing the hard disk

Disconnect the hard disk with the problem. At this time, NEC ESMPRO Agent reports the following alert to manager. And icons related to the hard disk with problem change the state of warning in the DataViewer.

Since the hard disk has been removed, the status of the SCSI slot will be "EMPTY."

TIPS: You can identify the new hard disk by DevicePathID (ex. 10/40/1).

When one hard disk with problem was disconnected, SCSI slot changes the status to "Warning."

[SCSI Slot] → [General]

IMPORTANT: The status color of the SCSI slot differs depending on the connection of mirrored hard disks:

- If one of the mirrored disks was removed: Warning

- If both of the mirrored disks were removed: Gray

Also, at this time, the redundant status of mirrored disks is changed to "Warning."

[Mirror Disk]

(3) Connect a new hard disk

Next, connect a new hard disk to the same SCSI Slot. At this time, NEC ESMPRO Agent reports the following alert to manager. And icons related to the hard disk are changed to the state of normal in the DataViewer.

When the hard disk is connected, SCSI Slot changes the status to "ONLINE."

[Alert report]

TIPS: You can identify the new hard disk by DevicePathID (ex. 10/40/1).

When the hard disk is connected, SCSI Slot changes the status to "Normal."

[SCSI Slot] → [General]

Also, at this time, the state of the mirrored disks changes to "Normal."

[Mirror Disk]

Maintenance of NEC Express5800/ft series

NEC Express5800/ft series maintenance can be done in two ways; one is to use NEC ESMPRO Manager for remote maintenance and the other is to use the NEC ESMPRO Agent ft server utility on the NEC Express5800/ft series for local maintenance.

> **TIPS:** To start the NEC ESMPRO Agent ft server utility installed in the NEC Express5800/ft series, select the items as follows:
>
> Start Menu→[Programs]→[NEC ESMPRO Agent]→[ft server utility]

The maintenance functions that can be executed from NEC ESMPRO include three types, those common to all components, those specific to particular components, and general system settings.

The maintenance functions common to all components are operated in the same way basically (the operation procedure and typical examples of screen images are described below).

The table below lists the availability of maintenance functions common to all components.

Component	Start		Stop		MTBF clear		Diag-nosis		F/W update	
	R	L	R	L	R	L	R	L	R	L
CPU module	√	√	√	√	√	√	√	√	√	√
PCI module	√	√	√	√	√	√	√	√	–	–
PCI slot	–	–	–	–	–	–	–	–	–	–
Ethernet adapter	–	–	–	–	√	√	–	–	–	–
SCSI adapter	–	–	–	–	–	–	–	–	–	–
SCSI enclosure	–	–	–	–	–	–	–	–	–	–
SCSI electronics	–	–	–	–	–	–	–	–	–	–
SCSI slot	–	–	–	–	–	–	–	–	–	–

R: Remote. Executable from remote management PC by using NEC ESMPRO Manager
L: Local. Executable on local server by using ft server utility
√: Supported
–: Not supported

Note: The MTBF clear of SCSI adapter and Ethernet cannot be performed to built-in devices.

The table below shows the component-specific maintenance functions executable from NEC ESMPRO.

Component	Dump harvest		Dump harvest during system operation		Board switch	
	R	L	R	L	R	L
CPU module	–	–	√	√	√	√

R: Remote. Executable from remote management PC by using NEC ESMPRO Manager
L: Local. Executable on local server by using ft server utility
√: Supported
–: Not supported

Component	Bus reset		Change of primary SCSI bus	
	R	L	R	L
SCSI bus	–	√	–	–

R: Remote. Executable from remote management PC by using NEC ESMPRO Manager
L: Local. Executable on local server by using ft server utility
√: Supported
–: Not supported

The table below shows the support of the whole system setup functions.

Component	Quick dump		Auto firmware update		Auto module start	
	R	L	R	L	R	L
Whole system	–	√	–	√	–	√

R: Remote. Executable from remote management PC by using NEC ESMPRO Manager
L: Local. Executable on local server by using ft server utility
√: Supported
–: Not supported

The table below shows the support of the preventive disk maintenance (S.M.A.R.T.) setup function.

Component	Preventive disk maintenance (S.M.A.R.T.) setup	
	R	L
SCSI disk	–	–

R: Remote. Executable from remote management PC by using NEC ESMPRO Manager
L: Local. Executable on local server by using ft server utility
√: Supported
–: Not supported

Start and Stop of Components

To start or stop a component with NEC ESMPRO Manager, use the [Maintenance] tree of the component in the [ft] tree of the DataViewer. Open the tree of the component to be started or stopped and select the [Maintenance] tree.

To start or stop a component with the ft server utility, use the utility screen of the component.

The table below shows the common cases in which a component is to be started or stopped.

Compo-nent	Start		Stop	
	Remote	Local	Remote	Local
CPU Module	When the cause of down is reviewed and the system is restarted in module down state. Executable in any of the following module states (this can be viewed on manager screen): • Removed • Broken • Shot • Firmware Update Complete • Diagnostics Passed	When the cause of down is reviewed and the system is restarted in module down state. Executable in the following module state: • When the status LED 1 is amber and the status LED 2 is off Only the status LED illuminates amber when the module is in one of the following states: • Removed • Broken • Shot • Firmware Update Complete • Diagnostics Passed	When system is stopped forcibly due to replacement or malfunction of module. Executable in the following module state (this can be viewed on manager screen): • Duplex	When system is stopped forcibly due to replacement or malfunction of module. Executable in the following module state: • Only the green LED is on and in redundant configuration state The both green LEDs are on when the module is in the following state: • Duplex
PCI Module	Same as above	Same as above	Same as above	Same as above
SCSI Slot	–	–	–	–

Remote: Executable from remote management PC by using NEC ESMPRO Manager
Local: Executable on local server by using ft server utility
–: Not supported

> **IMPORTANT:** PCI modules, SCSI adapters, SCSI buses, and modules under the SCSI enclosure have impact on each other. You need to be aware of this, for example, when you replace a PCI module. For details, see "Impact When Module Status Changes" described earlier in this chapter.

Procedure in NEC ESMPRO Manager

Start

1. Select the target component in the [ft] tree.

2. Check the current state with the "Status" display on the target component screen.

3. Click the [Bring Up] button in the [Maintenance] screen for the target component.

    A certain time is required for the start.

    The start result can be verified by "State" on the target component screen. The result of the start operation is reported by the NEC Express5800/ft series as an alert.

Stop

Perform the procedure below before replacing a component.

1. Select the target component in the [ft] tree.

2. Check the current state with the "State" display on the target component screen.

3. Click the [Bring Down] button in the [Maintenance] screen for the target component.

    A certain time is required for the stop.

    The stop result can be verified by "State" on the target component screen. The result of the stop operation is reported by the NEC Express5800/ft series as an alert.

Sample screen of NEC ESMPRO Manager 1

[Maintenance] screen of PCI module
[CPU Module] – [CPU Module] - [Maintenance]

Sample screen of NEC ESMPRO Manager 2

[Maintenance] screen of PCI module
[PCI Module] - [Maintenance]

Procedure in the ft server utility

Start

1. Select the target component by using the ft server utility.

2. Check the current state of the target component with the LEDs.

3. Click the [Up] button of the target component.

    A certain time is required for the start.

    The start result can be verified by the LEDs on the target component. The result of the start operation is registered in the event log.

Stop

1. Stop before replacing components.

2. Select the target component by using the ft server utility.

3. Check the current state of the target component with the LEDs.

4. Click the [Down] button of the target component.

    A certain time is required for the start.

    The start result can be verified by the LEDs on the target component. The result of the start operation is registered in the event log.

Sample screen of ft server utility

Check and Clear of MTBF Information

The MTBF information of a component can be viewed or cleared (initialized).

NEC Express5800/ft series manages the MTBF (mean time between failure) of each component. If a fault occurs in a component, the NEC Express5800/ft series calculates the MTBF of the component again. If the calculated value is lower than the pre-defined threshold, the NEC Express5800/ft series disables the component to be used.

Contact your maintenance personnel if such a symptom as above occurs.

> **IMPORTANT:** A disabled component with the MTBF lower than the threshold can be forcibly enabled by clearing the MTBF. However, contact your maintenance personnel for the forced use of such a component.

To clear the MTBF information of a component with NEC ESMPRO Manager, use the [Maintenance] tree of the component of the [ft] tree of the DataViewer. Open the tree of the component whose MTBF information is to be cleared and select the [Maintenance] tree.

To clear the MTBF information of a component with the ft server utility, use the utility screen of the component. The table below shows the potential cases in which the MTBF information of a component is to be cleared. Contact your maintenance personnel for clearing MTBF information.

Component	MTBF clear	
	Remote	**Local**
CPU Module	To start the module forcibly after replacing a module or if MTBF became lower than the threshold due to malfunction and disabled the module. Executable in the following module state (this can be viewed on manager screen): • Broken MTBF is lower than the threshold.	To start the module forcibly after replacing a module or if MTBF became lower than the threshold due to malfunction and disabled the module. Executable in the following module state: • The amber LED is on. • The event indicating that MTBF is lower than the threshold is registered in the event log.
PCI Module	Same as above	Same as above
Ethernet Adapter	To start the module/component forcibly after replacing a module or if MTBF became lower than the threshold due to malfunction and disabled the module/component. Executable in the following module state (this can be viewed on manager screen): Broken MTBF is lower than the threshold.	To start the module/component forcibly after replacing a module or if MTBF became lower than the threshold due to malfunction and disabled the module/component. Executable in the following module state (this can be viewed on manager screen): • The amber LED is on. • The event indicating that MTBF is lower than the threshold is registered in the event log.
SCSI Adapter	–	–

> **IMPORTANT:** You can also clear MTBF information for the PCI module, Ethernet Adapter and SCSI Adapter by unplugging and plugging the live wire of the PCI module.

Component	MTBF clear	
	Remote	Local
SCSI Enclosure	–	–
SCSI Electronics	–	–
SCSI Slot	–	–

Remote: Executable from remote management PC by using NEC ESMPRO Manager
Local: Executable on local server by using ft server utility
–: Not support

Procedure in NEC ESMPRO Manager

Perform the procedure below before replacement of a component.

1. Select the target component in the [ft] tree.

2. Check the current state with the "State" display on the target component screen.

3. Click the [MTBF Clear] button in the [Maintenance] screen for the target component.

The MTBF clearing result can be verified by "State" on the target component screen. The result of the MTBF clearing operation is reported by the NEC Express5800/ft series as an alert.

4. Start the component.

Sample screen of NEC ESMPRO Manager

[Maintenance] screen of SCSI enclosure
[PCI module] – [Maintenance]

Procedure in the ft server utility

Perform the procedure below before replacement of a component.

1.   Select the target component by using the ft server utility.

2.   Check the current state of the target component with the LEDs and event log.

3.   Click the [Clear] button in [MTBF Clear] of the target component.

The MTBF clearing result can be verified by the LEDs on the target component. The result of the MTBF clearing operation is registered in the event log.

4.   Start the component.

Sample screen of ft server utility

[PCI Module]

Diagnostics

The NEC Express5800/ft series provides the self-check diagnosis function for some components. If a fault occurs in a component, the NEC Express5800/ft series can diagnose the component to detect the fault.

To diagnose a component with the NEC ESMPRO Manager, use the [Maintenance] tree of the component in the DataViewer. Open the tree of the component to be diagnosed and select the [Maintenance] tree.

To diagnose of a component with the ft server utility, use the utility screen of the component.

The table below shows the potential cases in which a component is to be diagnosed.

Component	Diagnosis	
	Remote	Local
CPU Module	When a phenomenon causing the module to be down occurs or a phenomenon supposed to be a malfunction occurs. Executable in any of the following module states (this can be viewed on manager screen): • Removed • Broken • Shot • Firmware Update Complete To diagnose the module under operation, bring down the module before the diagnosis.	When a phenomenon causing the module to be down occurs or a phenomenon supposed to be a malfunction occurs. Executable in any of the following module states: • When the status LED 1 is red and the status LED 2 is off Only the status LED 1 illuminates amber when the module is in one the following states: • Removed • Broken • Shot • Firmware Update Complete (no fault found by diagnosis) To diagnose the module under operation, bring down the module before the diagnosis.
PCI Module	Same as above	Same as above

Remote: Executable from remote management PC by using NEC ESMPRO Manager
Local: Executable on local server by using ft server utility
–: Not support

Procedure in NEC ESMPRO Manager

1. Select the target component in the [ft] tree.

2. Check the current state with the "State" display on the target component screen. If the component is operating, stop the component.

3. Click the [Diagnostics] button in the [Maintenance] screen for the target component.

   The diagnosis result can be verified by "Result" of the diagnosis on the target component screen. The result of the diagnosis is reported by the NEC Express5800/ft series as an alert.

   The result of diagnosis executed last is displayed in the [Diagnosis Information] column. In addition, if a fault is detected by the result of the diagnosis, the state of the [General] tree of the component is changed.

Sample screen of NEC ESMPRO Manager

[Maintenance] screen of PCI module
[PCI Module] – [Maintenance]

Procedure in the ft server utility

   1.   Select the target component by using the ft server utility.

   2.   Check the current state of the target component with the LEDs. If the component is
            operating, stop the component.

   3.   Click the [Diagnostics] button in the [Diagnosis Information] on the target component.

            The diagnosis result can be verified by the LEDs on the target component. The result of
            the diagnosis is registered in the event log.

   4.   Start the component.

Sample screen of ft server utility

[PCI Module]

Firmware Update

NEC Express5800/ft series can update firmware (including BIOS) if some hardware components operate in the online state (in which the system continues the operation but the component trying to update firmware or BIOS is stopped).

To update firmware with NEC ESMPRO Manager, use the [Update] tree of the component in the DataViewer. Open the tree of the component for which firmware is updated and select the [Update] tree.

To update the firmware of a component with the ft server utility, use the utility screen of the component.

To update the firmware of a component, the firmware image file of the firmware for update must previously be stored in the managed server. On the firmware update screen, specify the path to the firmware image file for update.

The table below shows the potential cases in which the firmware of a component is to be updated.

Component	Firmware update	
	Remote	**Local**
CPU Module	When BIOS must be updated to new one. Executable in any of the following module states (this can be viewed on manager screen): • Removed • Broken or forced stop • No fault found by diagnosis To update the module under operation, bring down the module before the update.	When BIOS must be updated to new one. Executable in the following module state: • When the status LED 1 is amber and the status LED 2 is off Only the status LED 1 illuminates amber when the module is in one of the following states: • Removed • Broken or forced stop • No fault found by diagnosis (Firmware Update Complete) To update the module under operation, bring down the module before the update.

Remote: Executable from remote management PC by using NEC ESMPRO Manager
Local: Executable on local server by using ft server utility
–: Not support

Procedure in NEC ESMPRO Manager

1. Save the image data of the update firmware in an arbitrary directory of the NEC Express5800/ft series.

Save the image data in any way. Write down the path to the directory in which the image data is saved.

2. Select the target component in the [ft] tree.

3. Check the current state with the "State" display on the target component screen. If the component is operating, stop the component.

4. Click the [Firmware Update] button in the [Update] screen for the target component.

Sample screen of NEC ESMPRO Manager

[Update] screen of CPU module
[CPU Module] – [Update]

5. Select [Specify the file path to update], enter the directory in which the updated firmware specified in the input box in step 1 is saved, and click the [Execute] button.

Perform the firmware update.

The update result can be verified by the state on the target component screen (indication of "Firmware update completed"). The result of the update processing is reported by the NEC Express5800/ft series as an alert.

6. After the BIOS for a single CPU module is completed, click the [Jump Switch] button. The module completely updated is started and the active module is stopped.

7. Start the other module stopped.

Starting the module causes the firmware to be updated automatically. However, if the [Enable automatic firmware update] property is invalid, update the module in the procedure as follows:

(1) Check the current state with the "State" display on the target component screen. If the component is operating, stop the component.

(2) Click the [Firmware Update] button in the [Update] screen for the target component.

(3) Select the update method in the [Firmware Update] dialog box and click the [Execute] button.

(4) Start the module.

Even if you do not have the image data of firmware for update, the firmware can be copied from the other module.

By starting the module, the firmware will be updated automatically. However, when the [Enable automatic firmware update] property is disabled, follow the steps below to update the firmware:

1. Start the system using the module of the firmware copy source.

    See the current status by the "Status" indication on the target component screen of the copy destination and verify that it is stopped.

2. On the [Update] screen of the target component, click [Firmware update].

3. When a firmware updating dialog appears, check [Copy online BIOS image to Offline] and execute it.

    Firmware is updated by copying the firmware on the online side to the offline side.

4. Start the stopped module.

Procedure in ft server utility

1.   Save the image data of the update firmware in a desired directory of the NEC
Express5800/ft series.

Save the image data in some manner. Write down the path to the directory in which the
image data is saved.

2.   Select the target component with the ft server utility.

3.   Check the current state of the target component with the LEDs. If the component is
operating, stop the component.

4.   Click the [Firmware...] button for the target component.

Sample screen of ft server utility

[CPU Module]

5. Select [Specify new firmware for update], enter the directory in which the updated firmware specified in the input box in step 1 is saved, and click the [Activate] button. Perform the firmware update.

6. Check the update result with the event log.

7. After the BIOS for a single CPU module is completed, click the [Jump Switch] button.

The module completely updated is started and the module under operation is stopped.

8. Start the other inactive module.

Starting the module causes the firmware to be updated automatically. However, if the [Enable automatic firmware update] property is disabled, update the module in the procedure as follows:

(1) Check the current state with the "State" display on the target component screen. If the component is operating, stop the component.

(2) Click the [Firmware...] button for the target component.

(3) Select the update method in the [Firmware Update] dialog box and click the [Activate] button.

(4) Start the module.

Even if you do not have the image data of firmware for update, the firmware can be copied from the other module.

By starting the module, the firmware will be updated automatically. However, when the [Enable automatic firmware update] property is disabled, follow the steps below to update the firmware:

1. Start the system using the module of the firmware copy source.

See the current status by the "Status" indication on the target component screen of the copy destination and verify that it is stopped.

2. Click the [Firmware...] button for the target component.

3. When a firmware updating dialog appears, check [Copy firmware from Online module to Offline one] and execute it.

Firmware is updated by copying the firmware on the online side to the offline side.

4. Start the stopped module.

Dump Collection

To collect the dump file with NEC ESMPRO Manager, use [CPU Module] →[Maintenance] tree in the DataViewer.

To collect the dump with the ft server utility, use the utility screen of the component.

> **IMPORTANT:** Acquire the dump only for the examination of a fault.

The dump can be collected in two ways. In each way, the dump file is collected with the same path and file name "%SystemDrive%\NECDump\MEMORY.DMP" as the dump file of the OS standard.

- Collecting dump of inactive module

  The dump is acquired from the inactive CPU module (due to the occurrence of a fault or forced stop). But, do not use this function.

- Collecting dump under system operation

  Either of the CPU modules is entered into the offline state and the dump is collected during system operation. After the acquisition, the CPU module is returned to the online state again. This can be done only in the duplex system.

The table below shows the potential cases in which the dump is acquired.

Component	Saving dump of stopped module		Saving dump of component under system operation	
	Remote	**Local**	**Remote**	**Local**
CPU Module	–	–	When a fault or malfunction occurs in the system. Save the dump if requested by maintenance personnel. Executable in the following module state (this can be viewed on manager screen): • Duplex	When a fault or malfunction occurs in the system. Save the dump if requested by maintenance personnel Executable in the following module state: • When only the green LED is on and the module is in redundant configuration state Only the green LED is on when the module is in the following state: • Duplex

Remote: Executable from remote management PC by using NEC ESMPRO Manager
Local: Executable on local server by using ft server utility
–:   Not support

Procedure in NEC ESMPRO Manager

The [Dump] button of NEC ESMPRO Manager performs the function of "saving dump during system operation."

1. Select [CPU Module] in the [ft] tree.

2. Check the current state with the "State" display on the target component screen.

3. Click the [Dump] button in the [Maintenance] screen for the target component.

    A certain time is required for the dump saving.

    The dump is stored as %SystemDrive%\NECDump\MEMORY.DMP on the managed server.

    The result of the dump saving is reported by the NEC Express5800/ft series as an alert.

Sample screen of NEC ESMPRO Manager

[Maintenance] screen of CPU module
[CPU Module] – [Maintenance]

Procedure in ft server utility

1.   Select the target CPU module by using the ft server utility.

2.   Check the current state of the target CPU module with the LEDs.

3.   Select the dump acquisition method with [Dump] of the target CPU module and click the [Harvest] button.

A certain time is required for the dump acquisition.

The dump is stored as %SystemDrive%\NECDump\MEMORY.DMP on the server.

The result of the dump acquisition can be verified in the event log.

Sample screen of ft server utility

[CPU Module]

Setup of System Operation

The following properties can be set as the operation setup of the whole system.

▪ Quick dump

If this property is enabled (by checking "Enable" on the setup screen), the dump is acquired in parallel with the system startup if a fault occurs in the system. If this property is disabled, the dump is acquired by the dump function normally provided by OS.

The initial setup value is "Enable."

▪ Auto firmware update

If a new CPU module containing BIOS different from that of the existing CPU module in version with this property being enabled (by checking "Enable" on the setup screen), the BIOS of the new CPU module is updated to the BIOS of the existing CPU module to match with each other. If this property is disabled, the BIOS of the new CPU module is not update automatically.

The initial setup value is "Enable."

▪ Auto module start

If this property is enabled (by checking "Enable" on the setup screen), the CPU or PCI module newly inserted is automatically started to be operable. If this property is disabled, the module is not started automatically.

The initial setup value is "Enable."

> **IMPORTANT:**
> In the NEC Express5800/ft series with ft control software over 3.0, it is always necessary to set "Enable." Do not set "Disable."

The system operation can be set on [ft] tree→[General] screen of the ft server utility.

The table below shows the potential cases in which the system operation setup is changed. Contact your maintenance personnel for the change of the system operation setup. Setting change will take effect after system reboot. However, the utility does not indicate that reboot is required.

Component	Quick dump		Auto firmware update		Auto module start	
	Remote	Local	Remote	Local	Remote	Local
Whole system	–	Executable if the system is operating. When dump is acquired by using the dump function normally installed in OS at occurrence of system fault.	–	Executable if the system is operating. When firmware is updated manually at insertion of new CPU module	–	Executable if the system is operating. When firmware is updated manually at insertion of new CPU/PCI module

Remote: Executable from remote management PC by using NEC ESMPRO Manager
Local: Executable on local server by using ft server utility
–: Not supported

Configure the system settings using the ft server utility in the following procedure. The system cannot be configured using the NEC ESMPRO Manager.

1. Select [General] in the [ft] tree.

2. Check the property of carrying out the modification with [System Settings] (or cancel the check).

3. Click the [Apply] button.

Sample screen of ft server utility

Refresh of View based on State Change Alert Setting

A new function is supported so that NEC ESMPRO Manager window will be updated on a system state change basis (in other words, whenever necessary). This function is OFF by default. See the [Setting] below about how to turn it ON.

NEC ESMPRO Manager window is updated by one minute-interval polling by default. Therefore, there is some time-lag for NEC ESMPRO Manager to recognize changes in NEC ESMPRO Agent. By using this function, the time-lag can be reduced. However, it may consume a little bit more network band width since each state change will be notified to NEC ESMPRO Manager as some kind of alert.

[Setting]

1. Select [Program] - [NEC ESMPRO Manager] from the Start menu and click [Manager Settings].

[Manager Settings] dialog box

2. Check [Enable the State Change Alert Setting].

3. Click the [Agent Setting...] button.

[State Change Alert Setting] dialog box

4. Check the name of servers sending the state change alert to the Manager when NEC ESMPRO Agent recognizes changes in the state.

Click the [Execute] button for the setting change to take effect.

BMC Firmware Update

The firmware of the BMC on the PCI module can be updated.

The BMC firmware can be updated by using the ft server utility.

To update the BMC firmware, the firmware image file must previously be updated on the managed server. On the BMC firmware update screen, specify the pass of the image file of the firmware to be updated.

> **IMPORTANT:** Contact your maintenance engineer for the update of the BMC firmware.

Component	BMC firmware update	
	Remote	**Local**
BMC	–	When update to new firmware is required.

Remote: Executable from remote management PC by using NEC ESMPRO Manager
Local: Executable on local server by using ft server utility
– : Not supported

Procedure of Update from ft server utility

Update the firmware in the following procedure.

   1.   Click [Firmware] - [Firmware...].

      [Firmware Update] dialog box appears.

2. Enter the location to store the new firmware, and click [Activate].

[Verification] dialog box appears.

3. Click [OK].

Execute the firmware update.

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 PRODUCT INFO COLLECTION UTILITY

The NEC Product Info Collection Utility is used to collect various system configuration and log information for maintenance or troubleshooting purpose of the server.
This utility can be installed from NEC EXPRESSBUILDER DVD.

NOTE: Supported Operating Systems of this utility is as follows.

－Windows Server 2003

－Windows Server 2003 x64 Editions

Installation

You can install this utility according to the following procedure.
1. Insert NEC EXPRESSBUILDER DVD in the optical disk drive after OS starts.
2. Click from the menu displayed with Auto-run in order of [Setup software] – [Product Info Collection Utility].
3. The installation of this utility is started. Thereafter, install it according to the message in the dialog box. (In default, it is installed in "System drive: \ezclct" folder.)

IMPORTANT:

Please log-in the system in account with the administrator authority.

2.5GB or more free space is required for the installation drive.

Using Utility

Execute \stdclct\collect.exe in the installation folder of this utility.
The log folder is made in the above-mentioned folder, and various information on this device is stored in the data compressed file (zip form).

Uninstallation

Choose [Add or Remove Programs] - [Product Info Collection Utility (Vx.x.x)] from the control panel. Thereafter, uninstall it according to the message in the dialog box.

Active Upgrade

This section describes Active Upgrade process.

Introduction

Active Upgrade process allows you to upgrade system and application software while the important applications on an NEC Express5800/ft series system are online and available to users.

This section describes the overview of Active Upgrade process, the procedure and prerequisites necessary for preparing the system for the upgrade process, and configuring and performing the upgrade process with Active Upgrade Console. It also describes the troubleshooting when a problem occurs in Active Upgrade process.

Overview

Active Upgrade technology allows you to upgrade system and application software on an NEC Express5800/ft series system with minimal downtime.

Instead of taking your system offline to run upgrade procedures, you can use Active Upgrade technology to split the system into two independently running systems, one "side" of which you upgrade while the other "side" continues to run your applications without interruption.

To learn more about Active Upgrade technology, see the following topics:

- "Features" on this page.
- "Active Upgrade Process" on page 5-93

Features

Active Upgrade technology enables the following:

- Install software updates with minimal disruption to your critical applications.

The applications required for the server operation continue to run on one side of the system while you install software on, and even restart, the other side. There is only a brief disruption when you are finished installing updates, as your critical applications are restarted on the upgraded software.

- Test the latest software updates in your environment **before** making the updates permanent.

After your critical applications are restarted on the upgraded software, you can verify the success of your software updates in a production environment, with real users and system load. If you want to keep the changes, there is no additional downtime. Otherwise, as quickly as your system can restart, you can abort the upgrade to go back to the original version of your software.

- Abort the upgrade process at Split mode or Merge mode until you commit the changes.

If, for any reason, you are not satisfied with an upgrade, you can abort the upgrade session to return the system to its original state. Nothing is permanent until you choose to commit the changes. (Also, there is no disruption to your critical applications if you abandon the upgrade in the split mode, before testing the software in your production environment).

TIPS:

Active Upgrade Process, page 5-93
Software Upgrade Support, page 5-100
Prerequisites, page 5-102

Active Upgrade Process

The Active Upgrade process involves the following basic steps:

1. You prepare your system to ensure it meets the prerequisites of the Active Upgrade process.

2. You use the Active Upgrade Console to select the disks that will be affected by the software upgrade and to provide information about any applications or services that require special handling during the upgrade process.

3. You run a readiness check in the Active Upgrade Console to verify that your system meets the prerequisites for the Active Upgrade process.

4. You start the upgrade process by initiating *split mode*, which divides the fault-tolerant, duplexed system (Figure 1) into two independent, simplexed systems (Figure 2) — a *Production Side*, which continues to run your applications, and an *Upgrade Side*, on which you can run software installation packages.

Figure 1 Duplexed System

Figure 2. Splitting the System

When you split the system, the Active Upgrade Console disables any Rapid Disk ReSync (RDR) mirroring between the internal disks in each CPU/IO module enclosure and isolates the Upgrade Side from system resources such as the network, any user-specified application data disks, and any external PCI resources (such as external storage). It also disables user-specified applications and services on the Upgrade Side so they cannot restart if you restart the Upgrade Side.

Meanwhile, the Prod uction Side retains access to system resources and continues to run your applications uninterrupted.

5.   After the system successfully enters split mode, you establish a remote connection to the Upgrade Side of the system through the private network that exists between ft remote management cards and between Ethernet PCI adapters in each CPU/IO module enclosure. Using this remote connection, you can perform any of the following upgrade tasks **on the Upgrade Side:**

- Run software installation utilities and updaters (see "Software Upgrade Support" on page 5-100 for restrictions).
- Restart the operating system, if necessary.
- Perform limited testing of the installed updates (the Upgrade Side has no access to the network, external storage, or application data disks during this stage).

You can also completely abort the upgrade from the Active Upgrade Console, if necessary.

6. When you are finished installing software on the Upgrade Side, you disconnect the remote connection to the Upgrade Side and initiate the *merge* process.

   When you merge the system, the Active Upgrade Console stops your applications on the Production Side and unmounts any application data disks to ensure that pending disk updates are flushed to disk. It then merges system resources so that the network, external storage, and application data disks become available to the whole system again. With the exception of the internal disks, all critical system resources return to duplex mode (Figure 3).

Figure 3. Merged System

Finally, the system restarts your applications, including the Active Upgrade Console, from the Upgrade Side system disk. Depending on the complexity of your applications and the upgrade you performed, your applications may be backed up and running in under a minute.

7. After the system is successfully merged, you can test your applications and verify the success of your upgrade(s) with full access to the system's resources. If you discover a problem, you can still abort the upgrade process and restore the system to its previous state, because the original copy of your system disk (on the Production Side) has not been overwritten yet.

8. When you are certain that the upgrade(s) were successful, you can *commit* the changes to make them permanent.

   When you commit the changes, the Active Upgrade Console resynchronizes the RDR disks in your system by **overwriting** the original Production Side system disk and stale Upgrade Side data disks with their partner disks, which are up-to-date (Figure 4).

   ### NOTE:

   Because the original version of your system disk is erased during the commit process, you **cannot** abort an upgrade session after initiating the commit process.

Figure 4. Committing the Upgrade

When the RDR disk resynchronization is finished, all critical system resources are running in duplex mode, and the Active Upgrade process is complete. You do not need to restart the system, and, because your application is already running on the upgraded software, there is no additional downtime.

TIPS:

Aborting the Active Upgrade Process

Aborting the Active Upgrade process stops the current upgrade session and returns your system to its original state. If necessary, you can abort the Active Upgrade process at the split mode or at the merge mode until you commit the upgrade.

If you abort the upgrade session while the system is in split mode, no downtime is incurred. Your applications continue to run on the Production Side while the Active Upgrade Console restores the system to duplex mode.

If you abort the upgrade session while the system is in merge mode, a short period of downtime is incurred while the Active Upgrade Console initiates a system restart. The Active Upgrade Console shuts down the Upgrade Side and restarts the system from the Production Side, which automatically restarts your applications from the Production Side. The period of downtime is only as long as it takes your system and applications to restart.

In either case, the abort process uses RDR resynchronization to restore the internal disks to their original state by **overwriting** the unwanted Upgrade Side system disk and stale Upgrade Side data disks with their original partner disks (Figure 4).

Figure 5. Aborting the Upgrade

After you abort the Active Upgrade process, you can start another Active Upgrade session as soon as the RDR disk resynchronization is complete.

TIPS:

Active Upgrade State Model

The state model in Figure 6 shows all of the possible Active Upgrade states, and the order in which they occur during the Active Upgrade process.

Figure 6. Active Upgrade State Model

The state model helps to demonstrate the sequence of events in the Active Upgrade process, as follows:

1. All upgrade sessions start in the Idle state, where you can run the readiness check as many times as necessary to verify that your system meets the prerequisites of the Active Upgrade process.

2. When you start an upgrade session, the Active Upgrade Console switches to the PrepareSplit state, during which it runs a final readiness check and additional background tasks. If the system is ready, the console immediately switches to the Split state and proceeds to divide the system into two independently running systems.

> ### IMPORTANT:
>
> After the upgrade session leaves the Idle state, you must complete the full upgrade process in sequence, or, if necessary, abort the process altogether. You cannot go back to a previous state or skip states, and you cannot proceed to the next state if the upgrade is in a Broken or Busy operational state.

3. When you are done installing software on the Upgrade Side and you start the merge process, the Active Upgrade Console switches to the PrepareMerge state, during which it runs additional readiness tests and background tasks. If the system is ready, the console immediately switches to the Merge state and restarts your applications on the Upgrade Side.

4. When you are satisfied that everything is working correctly and you start the commit process, the Active Upgrade Console switches to the Commit state, during which it starts the resynchronization of your RDR disks. You can subsequently start the finish process, during which the Active Upgrade Console switches to the Finish state, cleans up system resources, and then returns the system to the Idle state. The upgrade session is complete.

If necessary, you can abort the Active Upgrade process from the split states or the merge states. When you abort the upgrade session, the Active Upgrade Console switches to the Abort state, during which it restores your system to its original configuration and starts the resynchronization of your RDR disks. You can subsequently initiate the finish process, as you would after committing an upgrade.

Alternatively, you can retry any of the Active Upgrade states to recover the system from a transient failure and move on to the next states without aborting the entire Active Upgrade process.

All of these Active Upgrade states are reported in the activity log and status bar of the Active Upgrade Console during the upgrade process. See "Understanding the Active Upgrade Console Interface" on page 5-114 for more information.

TIPS:

Active Upgrade Process, page 5-93
Software Upgrade Support, page 5-100
Prerequisites, page 5-102

Preparing for the Active Upgrade Process

Preparing for the Active Upgrade process involves the following tasks:

- Learning about the types of upgrades that the Active Upgrade process supports.

- Learning about the prerequisites for your NEC Express5800/ft series system.

- Learning how the Active Upgrade Console can control your critical applications.

- Performing pre-upgrade tasks on your ftServer system, such as:
    - Configuring the Remote KVM console.
    - Configuring the Remote Desktop Connection.
    - Installing the Active Upgrade Console.
    - Configuring Windows Firewall for the Active Upgrade process.
    - Gathering information about your system.
    - Copying any software installation packages to the system **before** the upgrade starts.

- Starting the Active Upgrade Console.

- Understanding the Active Upgrade Console.

Software Upgrade Support

Active Upgrade technology supports the installation or upgrade of application software that meets the following criteria:

- The application's executable files, configuration files, and temporary files (for example, cache files) reside on internal system disks that are mirrored with RDR.

- The application's persistent data files reside on separate data disks, either internal or external. (Data volumes that reside on the same physical disk as a system volume are not supported.)

- The application's installation or upgrade utility does not involve changes to files or databases on the data disks while the system is in split mode. (For example, the utility cannot create new databases or convert existing data records to be compatible with the new version of the application).
  The Upgrade Side has no access to the data disks while the system is split.

Active Upgrade technology does not support the following types of upgrades:

- Any upgrade that requires network connectivity during the upgrade process. For example, you cannot use an installer program that downloads its installation files from the Internet as the upgrade progresses. If possible, you must download the complete installer to the system prior to initiating split mode.

- BIOS, BMC firmware updates that can be performed while the system is duplexed and online.

    For more information on BIOS and BMC firmware update, see "Firmware Update" on page 5-73.

TIPS:

Prerequisites

Active Upgrade technology is supported **only on NEC Express5800/ft series system** that:

- Are running in duplex mode prior to starting the upgrade process.

  The CPU/IO modules must be duplexed, and all critical resources in the enclosures must be duplexed.

  A critical resource is a device (like a CPU, hard disk, or host bus adapter) that is necessary to maintain fault tolerance. Non-fault-tolerant resources (like tape drives) connected to the system will not affect the Active Upgrade process.

- Contain duplexed Ethernet PCI adapters.

  All **embedded** Ethernet PCI adapters must be teamed with the Intel PROSet utility, and each Ethernet team must contain at least one Ethernet PCI adapter from each CPU/IO module . Furthermore, at least one team of embedded Ethernet PCI adapters must have an active network link in each CPU/IO module.

  All ports on any dual-port adapter must be either teamed or not teamed. You cannot have only one port on an adapter teamed.

  You do not need to team non-embedded Ethernet PCI adapters, but it is recommended. The readiness check in Active Upgrade Console will display a warning for each unteamed Ethernet PCI adapter, but the warnings will not prevent you from proceeding with the Active Upgrade process.

  ### IMPORTANT:

  If you need to modify Ethernet teams that are actively providing network connectivity, this could impact network connectivity and should be scheduled to minimize impact to your critical applications.

  See "DUAL LAN CONFIGURATION" in Chapter 3, "Windows Setup and Operation" for more information about configuring Ethernet PCI adapters and Ethernet teams.

- Has one new IP address for Active Upgrade ready.

  You need to prepare one IP address to communicate between the Production Side/the Upgrade Side using PCI adapter during the Split. The IP address is allocated to the Upgrade Side system with the Split status.

- Do not use the devices connected with USB except the keyboard and mouse.

  In Active Upgrade, if you are using the devices connected with USB other than the keyboard and mouse, be sure to remove them physically before performing Active Upgrade.

- Contain the ft remote management card.

  The ft remote management card provides the connection between the Production Side and Upgrade Side during the Active Upgrade process. Both ft remote management cards must be configured properly and connected to the same subnetwork, preferably on a dedicated

maintenance network.

- Can tolerate running in simplex mode for a brief period during the upgrade.

  Because each side of the system runs in simplex mode during the upgrade, an interruption on the side that is actively running your critical applications can result in downtime.

  IMPORTANT:

  You cannot restart the operating system on the Production Side during an upgrade (though you can restart the Upgrade Side as many times as necessary.) Also, it is unsafe to pull an enclosure from a split-mode, simplexed system because doing so terminates all processes running on that enclosure.

- Can tolerate a potential decrease in performance during the upgrade.

  For example, if your system contains teamed network adapters that are configured for load balancing or link aggregation, there might be a decrease in network performance when the system is split because the network adapters on the Upgrade Side lose access to the network.

- Have been updated with the latest firmware to support Active Upgrades, including required BMC updates.

Furthermore, the Active Upgrade process has the following storage requirements:

- All internal hard disks must be configured with Rapid Disk Resync (RDR) and must be duplexed (synchronized) before the Active Upgrade process starts.

- The operating system boot volume and all active Windows operating system components must be located on internal RDR disks. This includes any volumes that contain paging (virtual memory) files for the operating system.

- Any disk that contains software you want to upgrade **cannot** contain persistent data files for your business-critical applications (those applications that will continue to run during the Active Upgrade process). You must store your data files on separate data disks, either internal or external. (Data volumes that reside on the same physical disk as a system or paging volume are also not supported.)

- External storage devices are always considered data disks. You cannot upgrade software on external storage devices, as these devices not available to the Upgrade Side of the system while the system is in split mode.

- When [Restrict each user to a single session] is cancelled with the case of Windows2008.
  In Windows2008, connection is restricted as one session per user by default. Connection may be disabled by this restriction if access is conducted from the Production Side to the Upgrade Side under the split mode.
  Go to [Administrative Tools]-[Terminal Services]-[Terminal Services Configuration] and uncheck [Restrict each user to a single session] from the [Restrict each user to a single session] property and cancel the restriction.

Recommendations

When preparing your system for the Active Upgrade process, also consider the following recommendations:

- Use static IP addresses for embedded Ethernet teams.

- If your system is protected by Windows Firewall, enable the exception for Active Upgrade Console as shown in "Configuring Windows Firewall for the Active Upgrade Process" on page 5-108.

  If Windows Firewall is running, and the exception for Active Upgrade Console is not enabled, communication between the Production Side and Upgrade Side might fail during the Active Upgrade process.

- Use caution when applying hotfixes from any source. Applying updates indiscriminately may introduce serious problems to your NEC Express5800/ft series system.

Managing Critical Applications during the Upgrade Process

The Active Upgrade Console enables to specify how business-critical applications are started and stopped during the Active Upgrade process.

If your NEC Express5800/ft series system runs business-critical applications, such as Microsoft Exchange Server or SQL Server, these applications can run on only one side of the system—the Production Side—when you split the system. They must be stopped on the other side—the Upgrade Side—to prevent resource conflicts and to allow you to proceed with upgrade tasks. Furthermore, when you merge the system, the same applications must be stopped on the Production Side and restarted on the Upgrade Side, so you can test the applications with the newly-upgraded system disk, and possibly commit the upgrade.

In general, critical applications are launched and exited automatically by the operating system. For example, your application might be configured to launch as a service in the Services Control Manager, or as a startup item in the system registry. But these resources control your applications only when the operating system itself is launched or exited. In most cases, to minimize downtime, the Active Upgrade Console executes upgrade operations, like split and merge, **without** restarting the operating system. Therefore, if you want to launch and exit your applications at the appropriate times during the upgrade process, you must configure the Active Upgrade Console itself to control the applications

Active Upgrade Console provides two methods for controlling your critical applications during the upgrade process. The method you use for each application depends on the type of application you want to control:

- Application services

  If your application runs as a standard service that already accounts for interdependencies (with other services) and requires no special handling, you can specify it on the **Application Services** page of the Active Upgrade Console during the configuration process. On the **Application Services** page, you can select each service you want to manage from the list of services on your system, and, when you start the upgrade process, the Active Upgrade Console will automatically start and stop these services at the appropriate times. See "Selecting Application Services to Control" on page 5-129 for more information.

- Custom actions

  If you have a custom application or integrated applications from several different software vendors, and you have special executables that start and stop these applications, you can specify the executables on the **Custom Actions** page of the Active Upgrade Console during the configuration process. Using the controls on the **Custom Actions** page, you can specify when your executables will run during the upgrade process, and, if you have several executables, you can specify the order in which they will run. See "Configuring Custom Actions" on page 5-133 for more information.

TIPS:

Pre-Upgrade Tasks

To prepare for upgrading the system, do the following:

1. Ensure that your NEC Express5800/ft series system meets the requirements and recommendations discussed in "Software Upgrade Support" on page 5-100, "Prerequisites" on page 5-102, and "Recommendations" on page 5-104.

2. If necessary, plan for the brief downtime associated with restarting your critical applications while merging the system.

3. Run backups of the system.

4. Verify the integrity of all RDR disks, as follows:

    a. In RDR Utility, click **Logical Disk Information**.
    b. Right-click an RDR virtual disk.
    c. Select **Verify RDR Virtual Disk**.
    d. Repeat for each RDR disk.

5. Upgrade the BMC firmware, if necessary, to support Active Upgrade technology.

6. Configure Remote Desktop Connection if necessary as described in "Configuring Remote Desktop Connection" on page 5-.98.

7. Verify the prerequisites to use Remote KVM Console and configure if required.

8. Prepare the IP address to allocate to the Upgrade Side's system.

9. Install the Active Upgrade Console as described in "Installing the Active Upgrade Software" on page 5-108.

10. If applicable, enable the exception for Active Upgrade Console in Windows Firewall properties, as shown in "Configuring Windows Firewall for the Active Upgrade Process" on page 5-108.

11. Gather information about your system using the worksheet in "Gathering Information" on page 5-110.

12. If necessary, copy any required software installation packages to the system, as described in "Copying Software Installation Packages to the System" on page 5-.

When you are finished preparing for the upgrade, start the Active Upgrade Console. Follow the on-screen instructions (and this document) to configure the process, and, when applicable, run the Readiness Check to verify if your system is ready to upgrade.

TIPS:

Installing the Active Upgrade Software, page 5-108
Software Upgrade Support, page 5-100
Prerequisites, page 5-102
Recommendations, page 5-104

Configuring Remote Desktop Connection

In the setup window of Remote Desktop Connection, enable the remote connection. For more information, see the Windows online Help.

If the remote connection is not enabled, the Production Side with Remote Desktop Connection cannot access the Upgrade Side in split mode.

Configuring Remote KVM Console

Configure Remote KVM Console function.
Refer to "Remote Management Function" in "Chapter 4. System Configuration."

IMPORTANT:

On Active Upgrade, Remote KVM Console function is used in order to display the console of the Upgrade side on the Production Side during Split status.
You need to execute [Server Initial Configuration] and [Managing PC Configuration] in "Chapter 4. System Configuration" and see "Remote Management Function" for this server.

Preparing an IP address to assign to the Upgrade Side

Prepare one IP address that meets the conditions below for Active Upgrade. You need this IP address to connect to the Upgrade side with Ethernet PCI Adapter while split.

–   A network address that is the same as the one assigned to the Ethernet team
–   An unassigned, unused IP address

For how to configure IP address, see "Setting the IP address for the Upgrade Side System."

Installing the Active Upgrade Software

Please install Active Upgrade when you use Windows Firewall with the following services starts. The exception setting of Windows Firewall is not appropriately added when installing it with this service doesn't start.

- For Windows 2003: Windows Firewall/Internet Connection Sharing(ICS)
- For Windows 2008: Windows Firewall

IMPORTANT:

Your login account must be in the Administrator group to install the Active Upgrade Console.

To install the Active Upgrade Console, do the following:

1. Insert the ftServer Active Upgrade Software CD-ROM into one of the CD/DVD drives. If the installation process does not start automatically, do the following:

   a. Open My Computer.
   b. Right-click on the appropriate CD/DVD icon, and click Explore in the shortcut menu.
   c. In the CD/DVD file listing, double-click **install.exe** to start the installation utility.

   The Active Upgrade Software Setup Wizard is displayed.

2. Click **Next** to view the end-user license agreement.

3. If you agree to the terms of the license, click the radio button for **I accept the terms in License Agreement** and click **Next**.

4. Click **Install** to install the files.

5. Click **Finish** to close the wizard.

The setup process installs the Active Upgrade Console and associated files in C:\Program Files\ftsys\ActiveUpgrade. It also creates Start menu items under **ftsys** and a shortcut on your desktop for the Active Upgrade Console.

TIPS:

Pre-Upgrade Tasks, page 5-106
Configuring the Active Upgrade Process, page 5-120

Configuring Windows Firewall for the Active Upgrade Process

The Active Upgrade Console requires network access to:

- Communicate with system components and underlying services in the ft control Software.

- Allow communication between the Production Side and the Upgrade Side while the system is split, so you can perform upgrade tasks.

If you have enabled Windows Firewall to protect your system, it might prevent you from using some of the features of Active Upgrade Console; therefore, you should enable the exception for the Active Upgrade Console in your Windows Firewall settings.

IMPORTANT:

Install the Active Upgrade software **before** configuring Windows Firewall. The installation process adds an entry for the Active Upgrade Console to the list of Windows Firewall exceptions. This entry might be disabled by default.

To configure Windows Firewall

1. Open the **Windows Firewall** control panel. For Windows 2008, select [Allow a program through Windows Firewall].

2. Click the **Exceptions** tab to display the list of exceptions (see below figure, "Windows Firewall Exceptions").

3. Click the check box next to **Active Upgrade Software** to activate it.

4. Click **OK** to enable this exception and close the control panel.

Windows Firewall Exceptions

Windows 2003   **Windows 2008**

TIPS:

Gathering Information

Before you start configuring the Active Upgrade process on your system, considering the following questions:

■   Did you decide the IP address for the Active Upgrade?
    This IP address should be the same network address that is allocated to Ethernet team and should be a new one.

■   After you complete this upgrade, will you ever want to run the same type of upgrade again? If so, plan to create a configuration file with the details of your upgrade, so you can use it again at a later date.

■   Did your support provider give you a configuration file that you could use as a template for your specific system and the type of upgrade you are performing? Or, do you have settings from other existing configuration files that you want to incorporate into your current configuration? (If applicable, you might be able to use more than one configuration file at a time by nesting them).

■   Which disks in your system contain the software you want to upgrade? Which disks cannot or should not be upgraded given the prerequisites of the Active Upgrade process? You will need to select these disks before splitting the system.

■   Which software installation utilities are you going to run during the Active Upgrade process? (If you are copying these to the system from a network resource, you need to do so before initiating split mode.) Do any of these installer programs require access to the network or data disks during the upgrade? (If so, you cannot use them with Active Upgrade technology.)

■   How do you start and stop critical applications on the system you want to upgrade? Are the applications configured as services in the Services snap-in to Microsoft Management Console? Or do you need to run custom actions (executables such as .bat, .vbs, .exe) to start your applications, possibly in a particular order? You need to identify these services and custom actions during configuration to allow the Active Upgrade Console to start and stop your applications at the appropriate times during the upgrade process. See "Managing Critical Applications During the Upgrade Process" on page 5-105 for more information.

■   Do you want to preserve Event Viewer log entries that are generated on the Production Side while the system is running in split mode? These log entries are typically lost during the commit process, when the system resynchronizes your RDR disks. If you want to save the files, you can configure the Active Upgrade Console to copy them to a backup directory before it commits the upgrade. You can save the standard log files as well as any custom log files you have opened in the Event Viewer.

When you finish answering these questions, you can use the worksheet on the next page to record your configuration information.

Active Upgrade Process Worksheet

Item	Value
IP address for Active Upgrade	_____ _____ _____
Configuration files to use	_____ _____ _____
Disks to upgrade	_____ _____ _____
Disks that cannot be upgraded	_____ _____ _____
Software installation utilities to run	_____ _____ _____
Application services to start/stop	_____ _____ _____
Custom actions to run	_____ _____ _____
Log files to back up	_____ _____ _____

TIPS:

Copying Software Installation Packages to the System

When the system runs in split mode, the Upgrade Side has no access to the network, external storage, or application data disks; therefore, if you need to download or copy any High Priority updates (hotfixes), installation packages, or disk images (for example, .msi files) to the system, put them on one of the disks you want to upgrade **before** you split the system. You might want to do so even before you run the Active Upgrade Console.

Make note of the location of the installation packages so you can find them later.

IMPORTANT:

If your installation packages are on CD-ROM, no action is necessary. You can access the DVD-ROM drive on the upgrade side while the system is in split mode.

TIPS:

Pre-Upgrade Tasks, page 5-106
Configuring the Active Upgrade Process, page 5-120

Starting and Exiting the Active Upgrade Console

IMPORTANT:

1. Your login account must be in the local Administrators group to run the Active Upgrade Console.

2. The Active Upgrade Console is not supported over remote connections.
    To start the Active Upgrade Console, disable remote connections, and then perform.

To start the Active Upgrade Console, do one of the following:

*   Double-click the **Active Upgrade Console** icon on your system's desktop.

*   On the **Start** menu, click **All Programs**, select the **ftSys** folder, and click **Active Upgrade**.

If you need to exit the Active Upgrade Console, click the close button ( ) in the upper right-hand corner of the window.

IMPORTANT:

1. If you are currently editing a configuration file, save the file before exiting the Active Upgrade Console.

2. If you exit the Active Upgrade Console by mistake during an upgrade task, the program maintains its state. For example, if you exit the Active Upgrade Console while you are in the process of splitting the system, the split process continues to run in the background. You can safely restart the Active Upgrade Console to continue where you left off.

TIPS:

Understanding the Active Upgrade Console Interface, page 5-114
Pre-Upgrade Tasks, page 5-106
Configuring the Active Upgrade Process, page 5-120

Understanding the Active Upgrade Console Interface

The Active Upgrade Console window (see the figure below) is divided into four major parts: a title bar, a navigation bar, a main window, and a status bar.

Active Upgrade Console

1. Title bar

2. Navigation bar

3. Main window

4. Status bar

TIPS:

Title Bar

The title bar displays the name of the current page of the Active Upgrade Console.

TIPS:

Navigation Bar

The navigation bar displays your current location in the Active Upgrade Console.

If you are creating or editing a configuration file, the navigation bar also allows you to skip between configuration pages by clicking any item under the **Configuration** heading (see the figure below), or by clicking **Active Upgrade** to start a readiness check.

Navigation Bar: Opening a Configuration Page

After you initiate an upgrade (by clicking **Split** on the **Active Upgrade** page), the navigation bar reverts to a static mode, in which it only indicates where you are in the upgrade process and does not allow you to skip between pages. You must follow the upgrade steps (split, merge, commit, and finish) in order to complete the upgrade process, or you can abort the process altogether.

The navigation bar contains the following entries:

- **Configuration** — Allows you to create or select a configuration file to modify, or to start the upgrade process with no configuration file.

- **Network Settings**— Allows you to verify the system network configuration and to configure IP address of the Upgrade Side. When you execute Active Upgrade for the first time, be sure to configure IP address of the Upgrade Side.

- **Disk Selection** — Allows you to select the disks that contain the software you want to upgrade.

- **Other Configurations** — Allows you to select other configuration files that will be incorporated into the current configuration.

- **Application Services** — Allows you to select the application services that need to be stopped and restarted during the upgrade process.

- **Log File Backup** — Allows you to select the Event Log (.evt) files from the Production Side that the Active Upgrade Console will preserve upon merging the system. (Otherwise, any event messages generated on the Production Side while the system is in split mode are lost when you commit the upgrade).

- **Custom Actions** — Allows you to specify executables that the Active Upgrade Console can use to stop and start your applications (or to perform special tasks) during the upgrade process.

- **Description** — Allows you to specify a title and comments for the current configuration file.

- **Upgrade Summary** — Displays a summary of the current upgrade configuration, and allows you to save the current configuration file.

- **Active Upgrade** — Allows you to perform a readiness test and, if applicable, to split the system for an upgrade.

- **Split System** — Indicates that the system is entering split mode, and allows you to merge system resources (or abort the upgrade) after you finish running installation packages.

- **Merge System** — Indicates that the system is entering merge mode, and allows you to commit (or abort) the upgrade after you have tested your changes.

- **Commit Upgrade** — Indicates that the system is committing the upgrade, and allows you to finish the process by cleaning up ft series system resources.

- **Abort Upgrade** — Indicates that the upgrade process has been aborted, and allows you to finish the process by cleaning up ft series system resources. (You can abort the upgrade process at the split mode or the merge mode prior to committing the upgrade.)

- **Finish** — Indicates that the upgrade process is complete and allows you to save a copy of the activity log to a file, start another upgrade, or exit the Active Upgrade Console.

- **Link:**

  – **Remote Desktop**

    Allows you to establish a Remote Desktop Connection session to the Upgrade Side while the system is split to perform upgrade tasks.

TIPS:

Starting and Exiting the Active Upgrade Console, page 5-113
Understanding the Active Upgrade Console Interface, page 5-114
Pre-Upgrade Tasks, page 5-106
Configuring the Active Upgrade Process, page 5-120

Main Window

The main window contains controls associated with the configuration and execution of the Active Upgrade process.

During the configuration phase, main window allows you to specify settings for your system (see the figure below), which you can save to a configuration file.

Main Window: Configuring the Active Upgrade Process

When you perform a readiness test and begin the upgrade process, the configuration settings in the main window are replaced with an activity log (see the figure below) that allows you to track the progress and success of the Active Upgrade process.

Main Window: Activity Log

For more information on viewing and interpreting items in the activity log, see "Viewing Active Upgrade Process Status" on page 5-168.

TIPS:

Starting and Exiting the Active Upgrade Console, page 5-113
Understanding the Active Upgrade Console Interface, page 5-114
Pre-Upgrade Tasks, page 5-106
Configuring the Active Upgrade Process, page 5-120

Status Bar

The status bar (shown below), which is located at the bottom of the Active Upgrade Console window, reports a quick summary of the status of the upgrade.

Status Bar

Hotfix Config		Production Side	Split		✅ Ready	✅ Partner: OS Up
1		2	3		4	5

1	Configuration file name	4	Operational State
2	Hardware State	5	Partner State
3	Upgrade State		

For more information about interpreting items in the status bar, see "Viewing Active Upgrade Process Status" on page 5-168.

TIPS:

Starting and Exiting the Active Upgrade Console, page 5-113
Understanding the Active Upgrade Console Interface, page 5-114
Pre-Upgrade Tasks, page 5-106
Configuring the Active Upgrade Process, page 5-120

Configuring the Active Upgrade Process

Configuring the Active Upgrade process involves the following tasks:

- Creating and managing configuration files

- Configuring the IP address for the Upgrade Side

- Selecting disks to upgrade

- Selecting other configuration files to include

- Selecting application services to control

- Selecting Event Viewer log files to back up

- Configuring custom actions

- Providing a description for a configuration file

- Displaying the upgrade summary

Creating and Managing Configuration Files

Configuration files allow you to save upgrade configurations that you can use immediately or in the future.

If you frequently perform upgrades your system, you can create a configuration file to preserve your settings so you can perform similar upgrades as often as necessary. If applicable, you can create multiple configuration files, each with different system settings to prepare the system for a particular type of system or application software upgrade.

In addition, you can *call* one or more existing configuration files from the configuration file you are currently editing, so that the settings from the called files will also apply to the file you are editing. This is called *nesting*

The default location for Active Upgrade configuration files is \Program Files\ftsys\ActiveUpgrade\User Configurations, but you can save a configuration file in any directory. If you specify a different directory when saving or opening files, the Active Upgrade Console uses the same user-specified directory (on a per-user basis) the next time you open the file browser.

IMPORTANT:

You can save a configuration file to any disk – system or data, internal or external. The Active Upgrade Console automatically copies configuration files to a staging area before beginning the upgrade to ensure that they are available throughout the upgrade process.

See TIPS for more information about working with configuration files.

TIPS:

Creating a Configuration File

Creating a configuration file allows you to generate a configuration file that you can save and use immediately or at a later time.

To create a configuration file

1. On the **Configuration** page, click **Create Configuration File**.

2. In the **Create Configuration File** dialog box, specify a file name for the new file. (When you save the file, a **.config** extension is automatically appended to the file name.)

3. Next to **Save in**, select the directory in which to save the configuration file.

    You can specify any directory on the system. The default location is \Program Files\ftsys\ActiveUpgrade\User Configurations; however, if you choose a new configuration directory, the Active Upgrade Console will use the new directory the next time you create or open a file.

4. Click **Save** to start editing the configuration.

After you create a configuration file, the configuration process opens on the **Disk Selection** page.

TIPS:

Loading a Configuration File

Loading a configuration file allows you to open an existing configuration file for use. After you load a configuration file, you can view the **Upgrade Summary**, and, if applicable, proceed with the upgrade as configured, but you cannot modify the configuration.

IMPORTANT:

To modify a configuration file, use the **Edit Configuration File** option.

IMPORTANT:

The disk number might be changed in the FT server at the switch of the CPU/IO module etc. The disk for the upgrade might be recognized by mistake when making the configuration file and the disk number are different. In this case, do not use "Load Configuration File".

To load a configuration file

1.   On the **Configuration** page, click **Load Configuration File**.

2.   Do one of the following to select the configuration file:

   •   In the **Locate Configuration File** dialog box, type the full path name and file name for the configuration file next to **Configuration File**. (You must include the **.Config** file extension.)

   •   Click **Browse** to locate the file using a file browser. (The browser displays only files with the **.Config** extension.) Click the file in the file browser, then click **Open** to select the file.

3.   In the **Locate Configuration File** dialog box, click **Load** to open the configuration file.

(You can also drag a configuration file onto the **Configuration** page of the Active Upgrade Console window to load it.)

When you load a configuration file, the file opens on the **Upgrade Summary** page.

TIPS:

Creating and Managing Configuration Files, page 5-120
Displaying the Upgrade Summary, page 5-141
Performing the Upgrade, page 5-142

Editing an Existing Configuration File

Editing a configuration file allows you to open and edit a configuration file that you have previously saved. After you edit the configuration file, you can view the **Upgrade Summary**, and, if applicable, proceed with the upgrade as configured.

IMPORTANT:

The disk number might be changed in the FT server at the switch of the CPU/IO module etc. The disk for the upgrade might be recognized by mistake when making the configuration file and the disk number are different, and do Active Upgrade, please after appropriately setting the disk for the upgrade on the [Disk Selection] screen.

To edit a configuration file

1. On the **Configuration** page, click **Edit Configuration File**.

2. Do one of the following to open the file:

    - In the **Locate Configuration File** dialog box, type the full path name and file name for the configuration file next to **Configuration File**.

    - Click **Browse** to locate the file using a file browser. (The browser displays only files with the **.Config** extension.) Click the file in the file browser, then click **Open** to select the file.

3. In the **Locate Configuration File** dialog box, click **Load** to open the configuration file.

When you edit a configuration file, the file opens on the **Disk Selection** page.

TIPS:

Creating and Managing Configuration Files, page 5-120
Saving a Configuration File, page 5-125
Selecting the Disk to Upgrade, page 5-118
Displaying the Upgrade Summary, page 5-141

Performing an Upgrade with No Configuration File

If the upgrade you want to perform does not require any special settings, you can proceed without a configuration file.

IMPORTANT:

When you execute the Active Upgrade for the first time, you need to use the configuration file to update. You can upgrade without the configuration file only when you have executed the Active Upgrade with the configuration file before.

For example, if you have only one system disk, and you just want to split the system briefly to test how a hotfix would affect the operating system without committing the changes, you might not need a configuration file.

To proceed without a configuration file, click **No Configuration File** on the **Configuration** page. The Active Upgrade Console immediately displays the **Active Upgrade** page and runs a readiness check. If your system meets the prerequisites for the Active Upgrade process, you can split the system at this time.

TIPS:

Creating and Managing Configuration Files, page 5-120
Performing the Upgrade, page 5-142

Saving a Configuration File

The Active Upgrade Console automatically prompts you to save your configuration file if you leave the Configuration section of the application, or exit the application. (To save the configuration file, click **Yes**, otherwise click **No** or **Cancel**.)

You can also optionally click **Save** or **Save As** on the **Upgrade Summary** page, as described in the following procedure.

To save the current configuration file

1. Click **Upgrade Summary** in the navigation bar.

2. On the **Upgrade Summary** page, do one of the following:

   - Click **Save** to save the configuration file with the name and path name you previously specified. Your file is saved.

   - Click **Save As** to save the configuration file with a new file name or path name. Continue to step 3.

3. In the Save Configuration File dialog box, specify a name for the new file. (When you save the file, a .Config extension is automatically appended to the file name.)

4. Next to Save in, select the directory in which to save the configuration file.

5. Click Save to save the file. Your file is saved.

TIPS:

Creating and Managing Configuration Files, page 5-120
Displaying the Upgrade Summary, page 5-141

System IP Configuration on the Upgrade Side

Use [Network Settings] screen to allocate the IP address for the Upgrade Side's system with Split status. Verify the configuration by checking the Ethernet team configuration, status and the allocated IP address that appear on [Network Settings] screen. In [Upgrade-side IP address] field, allocate the IP address to the Upgrade Side.

IMPORTANT:

- Team adapter name or network adapter name may not be displayed appropriately in [Name] row or [Network Settings] screen. This has no effect on the Active Upgrade's operation.

- Available IP address for the Upgrade side system is as follows:

  – IP address that belongs to the same network address as the one allocated to the Ethernet team.
  – An unused IP address.

Selecting Disks to Upgrade

Use the **Disk Selection** page to select the disks that contain the software you want to upgrade with the Active Upgrade process. By marking these disks in your upgrade configuration, you ensure that they will be available to the Upgrade Side of the system when the system is in split mode.

When you open the **Disk Selection** page, the Active Upgrade Console scans for and displays the disks in your system. **Only internal disks mirrored with RDR are displayed, as these are the only disks that can be configured**.

You can mark each disk as a *system disk* or a *data disk*:

System Disk

A disk that contains the system or application software you want to upgrade. Only disks marked as **System** will be available to the Upgrade Side while the system is split.

The Active Upgrade Console automatically marks some disks as system disks. These *mandatory system disks* contain either boot files or paging files (virtual memory files) that are currently in use by the running operating system. You cannot change a mandatory system disk to a data disk.

IMPORTANT:

You cannot use a system disk for storing persistent data (for example, database files) related to your critical applications. Any new data written to the original system disk by the Production Side while the system is in split mode is overwritten when you commit the upgrade. (See the "Overview" for information about the steps of the Active Upgrade process.)

Data Disk

A disk that contains persistent data for your critical applications. Any disk marked as **Data** will be available **only** to the Production Side while the system is split. You **cannot** upgrade software on a data disk.

IMPORTANT:

All external storage devices are automatically considered data disks.

(See the prerequisites for the Active Upgrade process for additional restrictions.)

Volumes on the **Disk Selection** page are color-coded as described in the below table.

Hard Disk Color Coding

Color	Description
Black	Unassigned disk space
Blue	Data disk
Light Green	System disk
Dark Green	Mandatory system disk
Red	Disk is currently simplexed because it is being resynchronized with RDR

For more information about any volume, move your cursor over the volume to display ToolTip help.

To select system and data disks

- For any disk you want to mark as a system disk, click the **System** radio button.
  (This automatically marks any volume that the disk contains as a system volume.)

- For any disk you want to mark as a data disk, click the **Data** radio button.

IMPORTANT:

Volumes can span multiple physical disks, and physical disks can contain multiple volumes. If a volume spans two or more disks, and you mark one of the disks that contains that volume as a system disk, any disk that contains a part of that volume automatically becomes a system disk.

When you are finished selecting disks, you can click **Next** to proceed with the next configuration step.

TIPS:

Prerequisites, page 5-102

Selecting Other Configurations to Include

Use the **Other Configurations** page to optionally call one or more existing configuration files into the configuration file you are currently editing, so that the settings from the called files will also apply to the file you are editing. This is known as nesting files, or creating nest files.

The configuration files that you call into the current configuration file are *child configurations*, and the file from which you call the child configurations is the *parent configuration*.

Potential uses for the nest files include:

- Your support provider creates a configuration file that you can call into an existing configuration file for your system.

- You create separate configuration files, each for upgrading a different application, which you can enable or disable as necessary in your parent configuration.

- You create a configuration file for an application that runs on several of your systems and call that file into a parent configuration file that is specific to each system.

The following restrictions apply to the nest files:

- Child configuration files must be located in the same directory as the call target files. When you select configuration files in the Active Upgrade Console, only the files in the current working directory are displayed.

- If a call-target configuration files have more than one child configuration files, they also become a part of your configuration.

- If a setting in a child configuration conflicts with a setting in the parent configuration, the Active Upgrade Console uses the setting in the parent configuration; the parent configuration always ignores disk selections from child configurations.

- If you call a configuration created on a different system, configuration items (such as application services and custom actions) must be present and applicable on the current system; otherwise, the parent configuration will fail the readiness check.

To call a child configuration file into the current file

1. On the **Other Configurations** page, select the check box next to the configuration file(s) you want to call into the current file.

2. In the file window, verify that you have selected the correct configuration files. Also, if any of the files contain additional child configurations, ensure that you are including only the configurations that apply to the current parent file.

3. When you are finished editing the current configuration, save the configuration file.

To remove a child configuration file from the current configuration, clear the check box next to that configuration file. (If you need to remove a child configuration from another configuration file, you must edit that configuration file separately.)

When you have finished specifying child configuration files, you can click **Next** to proceed with the next configuration step.

TIPS:

Creating and Managing Configuration Files, page 5-120
Saving a Configuration File, page 5-125
Displaying the Upgrade Summary, page 5-141

Selecting Application Services to Control

Use the **Application Services** page to select the critical application services you want the Active Upgrade Console to automatically stop and restart during the upgrade process.

If you select a service on the **Application Services** page, the Active Upgrade Console controls the service as follows:

- When the system is split, the console stops the service on the Upgrade Side, saves its current **StartupType**, and changes the **Startup Type** to **Disabled**. This helps to prevent application errors associated with the Upgrade Side losing access to data disks and the network while the system is split.

- When the system is merged, the console stops the service on the Production Side, restores the previous Startup Type for the service on the Upgrade Side, and starts the service on the Upgrade Side. This ensures continuous availability of the service, enables comprehensive testing on the Upgrade Side, and prevents any conflicts associated with two instances of a service running at the same time.

When an upgrade is aborted, and if the system is in merge mode, the console shuts down the Upgrade Side to stop the service automatically. The console automatically restarts the Production Side based on its default **Startup Type**. This restores the system to its previous, fault-tolerant state.

IMPORTANT:

1. Standard operating system services do not require control during the Active Upgrade process. Select only services that are related to your critical applications (such as Exchange, SQL and IIS).

2. The Active Upgrade Consol never changes the default Startup Type for a service on the Production Side. Maintaining the default Startup Type on the Production Side ensures that a service will always be able to restart on the Production Side if the upgrade process is aborted or failed.

Selection of Application Services

Check Box State	Description
Cleared	Not selected.
Checked	Selected in the current configuration file.
Checked (Gray)	Selected in a child configuration file. If applicable, you can click the check box to explicitly select the service in the current configuration file, but you cannot deselect it without editing the child configuration.

To select a service for the Active Upgrade Console to control

1. On the **Application Services** page, find a service you want to stop and start.

2. Click the check box to the left of the service name.

3. Repeat these steps for each service you want to stop and restart.

To deselect a service, clear the check box to the left of the service name.

(By default, the services on the **Application Services** page are listed alphabetically. If you prefer to sort them by other criteria, click on one of the column headings. For example, if you want to group services by those you have selected and not selected, click the heading above the check boxes.)

When you have finished selecting services to control, or if you have no services to control, you can click **Next** to proceed with the next configuration step.

TIPS:

Configuring Custom Actions, page 5-133
Managing Critical Applications During the Upgrade Process, page 5-105
Displaying the Upgrade Summary, page 5-141

Selecting Event Viewer Log Files to Back Up

Use the **Log File Backup** page to optionally preserve Windows Event Viewer log files from the Production Side of your system during the Active Upgrade process.

When you commit an upgrade, the system reestablishes the RDR mirrors of any system disks by overwriting the Production Side disks (which contain the old version of your software) with the newer Upgrade Side disks (which contain your newly-upgraded software). Because the event log files on the Production Side are lost during this process, you might want to preserve them for future reference. These log files will contain the only record of log messages your live applications generated while the system was split.

The **Log File Backup** page allows you to select from all event logs available in the Windows Event Viewer, including user-created logs.

IMPORTANT:

For information about creating a Custom Action that preserves other files from the Production Side system disk, see "Configuring Custom Actions" on page 5-133.

Saving Event Viewer log files

1. Specify a directory in which to save the files by doing one of the following:

    *   In the Staging Directory dialog box, type the full path name of the directory.
    *   Click Browse to locate a folder using the Browse for Folder dialog box.
        Click a folder and click OK to select it.

IMPORTANT:

1. You must save the files to a disk that is available to the Production Side while the system is split — either a data disk or an external disk. Do **not** save the files to a system disk or network disk.

2. There is no default directory. You must specify a directory, otherwise, the Active Upgrade Console displays a warning message.

2. For each log you want to save, click the log name to highlight it, then click the check box to the left of the log name to preserve the file.

When you have finished selecting Event Viewer log files to preserve, you can click **Next** to proceed with the next configuration step.

TIPS:

Configuring Custom Actions, page 5-133
Displaying the Upgrade Summary, page 5-141

Configuring Custom Actions

Use the **Custom Actions** page to customize the way that the Active Upgrade process will run in your environment. You can create custom actions to perform the following types of tasks:

- **Specify how a critical application is stopped and started during the Active Upgrade process.**

  For example if you use special executables to start and stop your applications, you can use the controls on Custom Actions page to specify when these executables will run during the upgrade process; if you have several executables, you can specify the order to run.

- **Check if a certain condition exists before starting the upgrade process.**

  For example, you can write a program to verify that a critical backup has completed on the following; if the critical backup has completed; if the system load on the system is acceptable, or if it is a certain time of a day before starting the upgrade process.

- **Backup files during the upgrade process.**

  Any files that are modified on the Production Side system disks while the system is in split mode are lost during the commit process, when the RDR mirrors are resynchronized. If applicable, you can write a program to save copies of important files before you commit an upgrade. For example, you can save a copy of an application-specific log file that does not appear in the system Event Viewer. (For information about saving Event Viewer logs, see "Selecting Event Viewer Log Files to Back Up" on page 5-131.)

By default, the **Custom Actions** page supports executables that are batch files (.bat) or application files (.exe). If you want to use a Visual Basic script (.vbs), see "Programming Notes for Custom Actions" on page 5-136 for special instructions.

IMPORTANT:

1. Custom actions run consecutively when called. If one action fails to terminate, it might prevent the next action from executing, and, ultimately, prevent the upgrade process from continuing. When you specify an executable for a custom action, verify that it runs successfully outside of the Active Upgrade process, and ensure that it completes in a timely manner.

2. Executables for custom actions must be located on a system disk. If an executable is located on an external or network disk, the Upgrade Side will lose access to the executable while the system is in split mode.

3. For information about writing your own programs for custom actions, see "Programming Notes for Custom Actions" on page 5-136.

To configure a custom action

1. On the Custom Actions page, do one of the following:

    *   Next to **File**, type the full path name and file name of the executable you want to run. The file must already exist on the system.

        Example: C:\bin\mybatchfile.bat

    *   Click **Browse** to locate the executable using a file browser. Click the file name in the file browser, and click Open to select the file.

2. Next to **Arguments**, type any arguments that you need to run with your executable.

    No arguments are required; however, see "Programming Notes for Custom Actions" on page 5-136 for information about passing optional Active Upgrade environment variables to your executable.

3. In the drop-down list for **Control type**, select the option that best describes when the Active Upgrade Console will execute your custom action, as discussed in the below table.

Control Types for Custom Actions

Control Type	Purpose
Start Application	Executes the custom action whenever the Active Upgrade Console needs to start applications. For example, the console needs to restart applications on the Upgrade Side when you merge the system.
Stop Application	Executes the custom action whenever the Active Upgrade Console needs to stop applications. For example, the console needs to stop applications on the Upgrade Side when you split the system. It also stops applications on the Production Side when you merge the system.
Readiness Check	Executes the custom action once during the readiness check, before you initiate the Active Upgrade process. This control type allows you to build your own verifications into the readiness check.

Advanced	Executes the custom action during every step of the Active Upgrade process, including interim steps such as PrepareSplit and PrepareMerge, which occur prior to the Split and Merge operations. This control type allows you to have more precise control over a custom action. Your executable will run each time the Active Upgrade process switches states, but you can write a program with conditional statements based on Active Upgrade environment variables to specify exactly when and where particular tasks should be executed. For example, you can write a conditional statement that will trigger only on the Upgrade Side if the system is in merge mode. If you have more than one custom action, the Advanced control type also allows you to control the order in which the custom actions are executed (step 4).
Backup	Executes the custom action when the system is merged, allowing you to back up files that were modified on the Production Side system disk while the system was in split mode (before these files are lost during the commit process).

4.   If you selected the **Advanced** control type, optionally select an item from the **Timing** drop-down list which best describes the order in which you want this custom action to run with your other custom actions. The below table, "Timing for the Advanced Control Type", describes the timing options. If the timing does not matter, keep the **Default** setting.

IMPORTANT:

The **Timing** will not affect the order in which custom actions run with other Active Upgrade tasks. Use this option only if you want to ensure that one custom action runs before or after another custom action.

Timing for the Advanced Control Type

Timing	Purpose
Default	Executes the custom action in the default, consecutive order.
Before	Executes the custom action early in the list of custom actions, before items marked as Default or After.
After	Executes the custom action late in the list of custom actions, after items marked as Before or Default.

Your custom actions will run consecutively according to their timing options. Subsequent custom actions will not start until the current custom action terminates.

5.   Click **Add** to accept the custom action. (If the **Add** button is inactive, ensure that you typed the **File** path name and executable name correctly. The executable file must exist to be added.)

You can view the custom actions you have created at the bottom of the **Custom Actions** page. If you want to remove a custom action from the list, select it and click **Remove**.

When you have finished specifying custom actions to run, or if you have no custom actions to specify, you can click **Next** to proceed with the next configuration step.

TIPS:

Programming Notes for Custom Actions, page 5-136
Selecting Application Services to Control, page 5-129
Managing Critical Applications During the Upgrade Process, page 5-105
Displaying the Upgrade Summary, page 5-141

Programming Notes for Custom Actions

The following topics describe some of the features available for programming and monitoring custom actions:

- "Starting and stopping applications" on this page

- "Using Active Upgrade Environment Variables" on page 5-137 "Generating Exit Values" on page 5-138

- "Viewing Standard Output and Error Stream" on page 5-138

- "Executing Visual Basic Scripts" on page 5-139

Starting and stopping applications

If you write a program to control a critical application during the upgrade process, ensure that your program not only stops and starts the application at the appropriate times, but also **disables** and **enables** the default startup mechanism for the application (for example, the default **Startup Type** setting in the Services Control Manager or a startup item in the system registry). If you do not disable the default startup type for an application, it might interfere with or override your custom action.

See "Selecting Application Services to Control" on page 5-129 for information about how the Active Upgrade Console changes the **Startup Type** for application services.

TIPS:

Programming Notes for Custom Actions, page 5-136
Configuring Custom Actions, page 5-133

Using Active Upgrade Environment Variables

You can optionally use the environment variables specified in the below table in any executable that you write for a custom action. These environment variables are useful if you want to write a conditional statement in your executable that, for example, runs only on a particular side of the system or only during a particular stage of the Active Upgrade process.

Environment Variables for Custom Actions

Environment Variable	Description
ACTIVE_UPGRADE_SIDE	Describes the side of the system on which the program is running.
	Values: Production, Upgrade
ACTIVE_UPGRADE_STATE	Describes the current upgrade state.
	Values: Idle, PrepareSplit, Split, PrepareMerge, Merge, Commit, Abort
ACTIVE_UPGRADE_REQUEST	Describes the next upgrade task that the Active Upgrade Console will execute.
	Values: Idle, CheckReadiness, PrepareSplit, ExecuteSplit, PrepareMerge, ExecuteMerge, Commit, Abort, Start, Stop, Backup
ACTIVE_UPGRADE_HW_SPLIT	Describes whether or not the ft series system is running in split mode.
	Values: Yes, No

If you want these environment variables to be available to your executables, you must pass the variables to each executable in which you will use them.

For example, to pass only the ACTIVE_UPGRADE_SIDE variable to an executable, append the following string to the **Arguments** for the custom action on the **Custom Actions** page:

```
%ACTIVE_UPGRADE_SIDE%
```

To pass multiple variables, add a space between each variable, as follows:

```
%ACTIVE_UPGRADE_SIDE% %ACTIVE_UPGRADE_REQUEST%
```

TIPS:

Active Upgrade State Model, page 5-98
Programming Notes for Custom Actions, page 5-136
Configuring Custom Actions, page 5-133

Generating Exit Values

An exit value of 0 indicates that the executable exited normally.

Any other exit value indicates that there was an error, which will prevent the Active Upgrade process from continuing with the current upgrade request. If this happens, you must correct the problem and click **Retry** in the Active Upgrade Console to retry the current upgrade request (which also runs the custom action again). The Active Upgrade process will not continue until the executable for your custom action runs successfully.

TIPS:

Programming Notes for Custom Actions, page 5-136
Configuring Custom Actions, page 5-133

Viewing Standard Output and Error Stream

After your program executes, you can view standard output and error output from the program in the Active Upgrade Console, as follows:

1. In the activity log, expand an **Execute custom actions** node.

    (There can be more than one **Execute custom actions** node, depending on the types of custom actions you have created. Find the node for the upgrade stage in which your custom action was set to run.)

2. Double-click a specific custom action to display more information about it.

3. In the detail window, view the output for your program under Status. If necessary, scroll down in the **Status** box to see the full output. Or move your cursor over the **Status** box to view the output as ToolTip help.

If you save the activity log to a file, you can also view the output in that file. See "Saving the Activity Log to a File" on page 5-174 for more information.

TIPS:

Programming Notes for Custom Actions, page 5-136
Configuring Custom Actions, page 5-133

Executing Visual Basic Scripts

By default, the **File** field on the **Custom Actions** page accepts only batch files (.bat) and application files (.exe). If you want to use a Visual Basic script (.vbs) on the **Custom Actions** page, you need to specify the command-line based script host (cscript.exe) in which the executable will run.

When performing the procedure in "Configuring Custom Actions" on page 5-133, do the following:

Next to **File**, type:
%SystemRoot%\system32\cscript.exe

(%SystemRoot% is an environment variable that automatically inserts your system root directory, typically C:\WINDOWS.)

Next to **Arguments**, type the full path name and file name of the executable. For instance:

C:\bin\myvbscript.vbs

If applicable, you can type additional arguments that are specific to your script file or options that are specific to the cscript session.

For example, you might want to specify the //T option for the cscript session to control the maximum amount of time your executable is allowed to run:

C:\bin\myvbscript.vbs //T:30

The preceding example would terminate the executable and cscript session after 30 seconds. Setting this type of time limit is a useful way of ensuring that your executable will not delay the upgrade process.

For more information about the cscript command, open a **Command Prompt** session and enter **cscript /?**

TIPS:

Providing a Description for a Configuration File

Use the **Description** page to specify a title and comments for your configuration file.

These items appear on the **Other Configurations** page, the **Upgrade Summary** page, and in the **Locate Configuration File** dialog box when you are selecting a configuration file to load or edit.

Type a brief summary next to **Title**, and type additional details next to **Comments**.

For **Comments**, you might want to include information such as:

- Purpose of the configuration file (type of upgrade)

- System(s) to which the file applies

- Special setting required before using the file for an upgrade

- Your name and contact information (or the contact information on your support provider)

- Date you created or updated the file

When you have finished providing a description for the configuration file, you can click **Next** to proceed with the next configuration step.

TIPS:

Displaying the Upgrade Summary

When you finish creating a new configuration file, or when you load or edit an existing configuration file, you can display a summary of the upgrade configuration that the file contains.

To display the upgrade summary, click **Upgrade Summary** in the navigation bar of the Active Upgrade Console. The summary window displays information including:

- Configuration file name, title and description

- The IP address to add to the upgrading system

- Disks you selected for the upgrade

- Other configuration files called by the current file

- Application services to launch and exit

- Custom actions to run

- Event Viewer log files to back up

If applicable, you can also save the current configuration file from the **Upgrade Summary** page.

When you are finished viewing the Upgrade Summary, and, if necessary, saving the configuration file, you can click **Next** to proceed with the Active Upgrade process.

If you have changed your configuration file since you last saved it, the Active Upgrade Console displays a message indicating that you should save the file. To save the file, click **Yes**, otherwise click **No** or **Cancel**.

In the next step, the Active Upgrade Console runs a readiness check to verify that your system meets the prerequisites for an online upgrade. If necessary, you can abort the process before you split the system (or at the split mode or the merge mode until you commit the upgrade).

TIPS:

Saving a Configuration File, page 5-125
Performing a Readiness Check, page 5-142
Aborting the Upgrade, page 5-166

Performing the Upgrade

Performing the Active Upgrade process can involve the following tasks:

- Performing a readiness check

- Splitting the system

- Merging the system

- Committing the upgrade

- Aborting the upgrade (if necessary)

- Finishing the upgrade

- Viewing the Active Upgrade process status

Performing a Readiness Check

Before you can initiate split mode on a system, the system must pass a readiness check. The readiness check verifies that your system meets the prerequisites for the Active Upgrade process. For example, the readiness check ensures that:

- The system is currently running in the duplex mode.

- The disks you selected as the system disks are present and are mirrored with RDR.

- The embedded Ethernet PCI adapters in your system are configured to Ethernet teams, and each team contains at least one adapter from each physical enclosure.

- The IP address configured to the system of the Upgrade Side must be an unused one, and this IP address is the same network address as the one Ethernet team.

- The application services you specified for control are currently running, and can be exited when necessary.

- The executables for any custom action are present on the system and are ready to run.

To perform a readiness test, choose to do **one** of the following:

- Click Next on the Upgrade Summary page (if you are using a configuration file).

- Click Active Upgrade on the navigation bar (the readiness test starts automatically if you have recently opened or changed your configuration).

- Click Retry on the Active Upgrade page.

- Click No Configuration File on the Configuration page.

The activity log reports the overall results of the readiness check as well as the results for each individual test. The below list describes the general meaning of the activity log entries.

Activity Log Entries

Icon	Text Color	Severity	Description
✅	Green	Success	Task completed without error
⌛	Black	Pending	Task is in progress
ℹ	Black	Information	Task information, no action necessary
⚠	Black	Warning	A problem that should be addressed, but will not block an upgrade
❌	Red	Error	A problem that must be corrected before continuing with upgrade

The status bar at the bottom of the window will indicate one of the following states for the current operation:

- ⌛ Busy

A readiness check is in progress. Allow time for the task to complete.

- ✅ Ready

The system meets the prerequisites for the Active Upgrade process. You can proceed with the upgrade process by splitting the system.

- ❌ Broken

One or more components in the system does not meet the prerequisites for the Active Upgrade process. You must resolve the problem before you can continue with the upgrade.

(For more information about interpreting Active Upgrade status, see "Viewing Active Upgrade Process Status" on page 5-168.)

If the check is successful, you can click **Split** to proceed with splitting the system. See "Splitting the System."

If one of the readiness tests fails, you must resolve the problem, then click **Retry** to run the readiness test again. When the problem is resolved, you can click **Split** to proceed with splitting the system.

TIPS:

Prerequisites, page 5-102
Splitting the System, page 5-136
Viewing Active Upgrade Process Status, page 5-168
Saving the Activity Log to a File, page 5-174
Aborting the Upgrade, page 5-166
Troubleshooting, page 5-174

Splitting the System

Splitting an NEC Express5800/ft series system divides it into two independently-functioning systems: the Production Side, which continues to run your applications, and the Upgrade Side, which you can safely upgrade.

Splitting the system:

- Disables RDR mirroring between the internal disks in each CPU/IO module enclosure

- Detach the Upgrade Side from system resources such as the network, any user-specific application data disks, and any external PCI resources (such as an external storage).

- Disables any user-specified applications and services on the Upgrade Side so they cannot restart if you restart the operating system on the Upgrade Side.

- Queues any ActiveService Network alerts generated on the Upgrade Side until the system is merged.

You can split a system only if it meets the prerequisites for the Active Upgrade process and has passed the readiness check.

IMPORTANT:

1. When in split mode, the Upgrade Side has no access to the network; the Upgrade Side can only access to the Production Side. If you need a network resource to obtain any software installation packages you intend to run, transfer the software to the system **before** you initiate split mode. Furthermore, put the software on one of the system disks, as these are the only disks you can access on the Upgrade Side while the system is in split mode.

2. Split the system only when you are sitting at the console for your NEC Express5800/ft series system. The Active Upgrade Console is not supported over remote connections. To start the Active Upgrade Console, disable remote connections, and then perform.

3. Never perform hardware maintenance, such as removing and replacing system components, while the Active Upgrade process is running, for example, left-clicking [Split].

4. Splitting the System fails if DHCP Client service stops. Do not stop DHCP Client service.

CAUTION:

Do not perform any hardware maintenance, including the removal of either CPU/IO module, after you have initiated the Active Upgrade process (by clicking Split).

To split the system

1.   Ensure that you have addressed any critical errors or warnings that were indicated by the readiness check.

2.   Exit any non-essential applications.

3.   Click **Split** on the **Active Upgrade** page.

When the system successfully enters split mode:

•   Active Upgrade Console continues to run on the Production Side of the system.

•   The Active Upgrade Console switches to the Split System page.

•   The upgrade state, reported in the status bar, is **Production Side\Split\Ready**, indicating that the system is currently split and ready to be merged after your software installation.

IMPORTANT:

Do not select [Abort] to interrupt the Active Upgrade process. The interruption could fail and the duplex may not complete. If the interruption failed, restart the OS to finish the interruption normally according to the following procedures; it enables to duplex the system.

(1)   Select the Upgrade Side's PCI module on the ft Server Utility.
(2)   Verify if [Status] of the Upgrade Side's PCI module is [Terminate].
(3)   Select [Boot] to start the Upgrade Side's PCI module.
(4)   Select [Retry] on the Active Upgrade console to finish the interruption process.

Splitting the system should take only a few minutes. The process will time out if it takes longer than 5 minutes.

IMPORTANT:

1.   Throughout the upgrade process, icons will appear and disappear in the system tray as PCI devices, such as Ethernet PCI adapters, are reconfigured or disabled for the current upgrade operation. This is normal. Do not attempt to enable or reconfigure any of these PCI devices while the upgrade session is in progress.

2.   If your system is running EMC® PowerPath® software for an external storage system, you might experience a brief delay (10-15 seconds) when the system splits, as PowerPath reroutes storage operations through the Production Side.

3.   If the Firewall setting is not appropriate, the split process could fail. If this occurs, select [Abort] to terminate Active Update. After the Active Upgrade is finished, automatic duplex processing is executed. When this duplex processing is completed, execute the Active Upgrade again.

If the split process fails the first time, you can click **Retry** to try again. If the problem persists, you can click **Abort** to abort the upgrade process, or see "Troubleshooting" for information about resolving the problem.

When the system is split, you can:

- Manage upgrade tasks on the Upgrade Side.

- Manage your applications on the Production Side.

- Verify the Upgrade Side before merging the system.

To perform upgrade tasks, you must establish a remote connection to the Upgrade Side, as explained in "Managing Upgrade Tasks on the Upgrade Side" on page 5-147.

TIPS:

After you establish a connection to the Upgrade Side, you can optionally check the status of your application services on the Upgrade Side, to verify that they have been stopped by the Active Upgrade Console. Refer to "Verifying the Status of Application Services" on page 5-175.

TIPS:

Managing Upgrade Tasks on the Upgrade Side, page 5-147
Managing Your Applications on the Productions Side, this page
Verifying the Upgrade Side Before Merging the System, page 5-158
Merging the System, page 5-160
Viewing Active Upgrade Process Status, page 5-168
Aborting the Upgrade, page 5-166
Troubleshooting, page 5-174

Managing Upgrade Tasks on the Upgrade Side

While the system is in split mode, you can perform any of the following upgrade tasks **on the Upgrade Side**:

- Run software installers and updaters (see "Running Software Installers" on page 5-152, and "Software Upgrade Support" on page 5-100 for restrictions).

- Restart the operating system, if necessary (see "Restarting the Upgrade Side" on page 5-155).

- Perform limited testing of the installed updates (see "Verifying the Upgrade Side Before Merging the System" on page 5-158

If necessary, you can also completely abort the upgrade process from the Active Upgrade Console on the Production Side.

Because the Active Upgrade Console itself runs on the Production Side of the system, you need to establish a remote connection to the desktop on the Upgrade Side before you can complete any of these upgrade tasks, as explained in "Connecting to the Desktop on the Upgrade Side" on page 5-148.

TIPS:

Connecting to the Desktop on the Upgrade Side, page 5-148
Running Software Installers, page 5-152
Restarting the Upgrade Side, page 5-155
Viewing Active Upgrade Process Status, page 5-168
Merging the System, page 5-160
Aborting the Upgrade, page 5-166
Troubleshooting, page 5-174

Connecting to the Desktop on the Upgrade Side

While the system is in split mode, the Active Upgrade Console runs on the Production Side of the system. To perform upgrade tasks, you must establish a remote connection to the Upgrade Side.

You can access the Upgrade Side using one of two methods:

■   Remote KVM

Allows you to transfer the Upgrade Side's console to the Production Side's browser with BMC remote KVM console. Allows you the complete access from the Production Side to the Upgrade Side using the video, keyboard and mouse.

■   Remote Desktop

Allows you to control the keyboard, video and mouse of the Upgrade Side through the Windows Remote Desktop component. You might prefer this option if you are more familiar with it, or if it runs faster in your environment.

To use either connection method, click on the associated link in TIPS below.

TIPS:

Connecting to the Upgrade Side with Remote KVM on page 5-149
Connecting to the Upgrade Side with Remote Desktop on page 5-151

IMPORTANT:

- Before connecting to the Upgrade Side from the Production Side by using Remote Desktop or Remote KVM, you need to complete the Split operation appropriately and check no error is output on the activity log. If Remote Desktop or Remote KVM is used during the Split operation, the connection may fail. If this occurs, retry the connection after the Split.

- Active Upgrade Console that appears on the Upgrade Side is just for monitoring the status such as [Remote Activity Log] under [Active Upgrade Operation Check] – [Activity Log] in many cases. However, the Active Upgrade Console looks like the console of the Production Side in some cases. In such a case, you need to care following issues.

- Never select any buttons (such as [Abort] or [Merge]) or any links (such as [Remote Desktop]) on the Active Upgrade Console of the Upgrade Side when in split mode. If you inappropriately select any of them, you may face an error or will not be able to refer to the data drive after the merge is completed. When this kind of trouble occurs, you need to take following procedures.

- When operation is unavailable because of the error, execute the same operation again from the Active Upgrade Console of the Production Side.

- When the data drive cannot be referred to the merge status, select [Retry] button and execute merge operation again. If you can't refer data drive after retrying the merge, select [Abort] button to exit the Active Upgrade, then again execute the Active Upgrade.

Connecting to the Upgrade Side with Remote KVM allows you to control the keyboard, video, and mouse of the Upgrade Side using the BMC remote console feature.

To initiate a Remote KVM session with the Upgrade Side

IMPORTANT:

When you use Remote KVM session, you need to prepare the setting of the Remote KVM before starting the Active Upgrade. Refer to [Chapter 4 System Configuration] – [Remote Management Function] for the Remote KVM settings.

1.   Access the following URL with the web browser on the Production Side:

http://BMC_HostPort/index.htm

TIPS:

"BMC_Host Port" consists of the IP address allocated to the LAN port of the Upgrade Side module that include ":" (colon) and the http port number on the back of the IP. When the http number is 80 (default), you can omit the port number.

2. If the browser displays a warning indicating that the Web site is being blocked, click **Add** to display the Trusted Sites dialog box. Click **Add** to add the site to your Trusted Sites zone, then click **Close** to dismiss the dialog box.

3. If the browser displays additional warning messages about running Web-based content, click **Close** or **OK** to dismiss these messages.

4. After login, go to [Control Panel] - [Remove KVM Console] and click [🖳] to start the Remote KVM console.

5. The Upgrade Side's login screen is displayed on the mainframe. Click "CtrlAlt" button [CtrlAlt] on the Remote KVM Console window and press "Del" on the virtual keyboard. This will send "Ctrl + Alt + Del" signal and allows to login.

For more details about the Remote KVM Console window and the virtual keyboard, go to chapter 4 "System Configuration" and see "Remote KVM Console" under "Using Remote Management".

After you initiate the remote session, see TIPS for more information about what you can do on the Upgrade Side and how you can merge the system after you have finished performing upgrade tasks.

To terminate a Remote KVM session with the Upgrade Side

1. Verify that the install processing is completed as well as the install program is all finished.

2. Select [X]on the upper right-hand side of the Remote KVM consol to close the window.

3. Select File menu on the upper left-hand side, choose **Finish** to log out from the main window.

4. Close the browser window with login page.

TIPS:

Terminating the Remote KVM is not mandatory. You can merge the system while maintaining the Remote KVM connection.

TIPS:

Connecting to the Upgrade Side with Remote Desktop, page 5-151
Running Software Installers, page 5-152
Restarting the Upgrade Side, page 5-155
Viewing Active Upgrade Process Status, page 5-168
Merging the System, page 5-160
Aborting the Upgrade, page 5-166
Troubleshooting, page 5-174

Connecting to the Upgrade Side with Remote Desktop

Remote Desktop allows you to control the keyboard, video and mouse of the Upgrade Side through the Windows Remote Desktop component.

To establish a Remote Desktop Connection to the Upgrade Side

1. Click **Remote Desktop** in the navigation bar of the Active Upgrade Console on the Production Side. The system opens a Remote Desktop Connection window.

2. When the window displays the login screen for the remote system, enter your administrative username and password and click **OK**. The Upgrade Side desktop is displayed.

For more information on what you can do, such as on the Upgrade Side after establishing the remote connection, and how to merge the system after completing the upgrade process, each connection, see TIPS below

If you maximize the Remote Desktop connection window, its title bar (which displays the IP address of the Upgrade Side as well as minimize, maximize and exit buttons), might disappear from view (autohide). Only the Upgrade Side desktop will be displayed, as if it is your local desktop. If you want to redisplay the title bar to access its controls, push the mouse pointer to the top of the screen.

TIPS:

The Remote Desktop title bar is a helpful reminder that you are using the Upgrade Side desktop. If you have maximized the window for Remote Desktop and you want the title bar to be displayed for the duration of your connection, click the pin button (pushpin) on the left side of the title bar. (The pin button is displayed only when the window is maximized.)

For more information about managing a Remote Desktop session, see the Windows online Help.

To terminate a Remote Desktop Connection to the Upgrade Side

1. Verify that any installer processes are complete, and that you have exited any installer programs.

2. Click [Shut Down] in the Start menu of your remote session.

3. In the Shut Down Windows dialog box, click [Disconnect].

> **TIPS:**
>
> If you are about to merge the system, you can remain logged on to maintain the current desktop session. After the merge, you will be using the Upgrade Side desktop.

Running Software Installers

The following topics describe how to run software installers on the Upgrade Side while the system is split:

- "Windows Automatic Updates" on page 5-146

- "Other Installation Packages" on page 5-154

(To review the types of upgrades that Active Upgrade technology supports, see "Software Upgrade Support" on page 5-100.)

> **TIPS:**
>
> Software Upgrade Support, page 5-100
> Managing Upgrade Tasks on the Upgrade Side, page 5-147
> Viewing Active Upgrade Process Status, page 5-168
> Merging the System, page 5-160
> Aborting the Upgrade, page 5-166
> Troubleshooting, page 5-174

Windows Automatic Updates

If you are using Windows Automatic Updates, and you previously downloaded all of the required software updates, the Automatic Updates icon should be present in the system tray, and it should report that updates are ready for your computer (see the figure below). If so, you are ready to apply the updates.

Automatic Updates Icon in System Tray

IMPORTANT:

Before installing any software, **ensure that you are working on the Upgrade Side desktop** (through a remote connection). Do not install software on the Production Side.

To apply the downloaded updates

1. Click on the Automatic Updates icon in the Upgrade Side system tray to display the **Automatic Updates** dialog box.

2. Select the radio button for **Custom Install** and click **Next**.

    The next page displays a list of the updates you downloaded and allows you to select which ones will be installed at this time.

3. Select only the updates that you previously checked for compatibility with your NEC Express5800/ft series system, then click Install.

During the installation process, the Automatic Updates dialog box minimizes to the system tray. When the installation is complete, you can display the dialog box again. It should report that all updates were successfully installed.

Some updates might require you to restart the operating system on the Upgrade Side. You can click **Restart Now** to allow Automatic Updates to restart the Upgrade Side automatically, or you can manually restart later. You can restart the Upgrade Side as many times as necessary to complete the installation.

See "Restarting the Upgrade Side" on page 5-155 for information about reconnecting to the Upgrade Side after you restart it.

TIPS:

Software Upgrade Support, page 5-100
Managing Upgrade Tasks on the Upgrade Side, page 5-147
Viewing Active Upgrade Process Status, page 5-168
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Other Installation Packages

If you previously downloaded individual software installers to a system disk, open the Upgrade Side folder that contains those installer files. Run each installer one at a time.

TIPS:

Before installing any software, **ensure that you are working on the Upgrade Side desktop** (through a remote connection). Do not install software on the Production Side.

Some installers might require you to restart the operating system on the Upgrade Side. You can allow these installers to restart the Upgrade Side automatically, or you can manually restart later. You can restart the Upgrade Side as many times as necessary to complete the installation; however, you might want to avoid restarting until you have run additional installers to reduce the total number of times you need to restart.

See "Restarting the Upgrade Side" on page 5-155 for information about reconnecting to the Upgrade Side after you restart it.

TIPS:

Software Upgrade Support, page 5-100
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Restarting the Upgrade Side

When the system is running in split mode, if necessary, you can restart the operating system on the Upgrade Side at any time. You can either allow a software installer to restart the system automatically or you can perform the following procedure to restart the system manually.

IMPORTANT:

Before you restart the system, ensure that you are working on the Upgrade Side desktop (through a remote connection). Do not restart the Production Side.

To manually restart the Upgrade Side

1. On the Upgrade Side, click **Shut Down** in the Start menu.

2. In the **Shut Down Windows** dialog box, select **Restart** from the drop-down menu and click **OK**.

If you are using **Remote KVM**, the AVR session will remain connected while the Upgrade Side is restarting; however, you must log on again when the Upgrade Side is finished restarting. (To send the Ctrl-Alt-Del key sequence necessary for login, use a virtual keyboard.)

If you are using **Remote Desktop Connection**, the connection to the Upgrade Side is terminated, and the Production Side desktop is displayed. While the Upgrade Side is restarting, you can view its status in the activity log and the status bar of the Active Upgrade Console. When the console displays the message **Partner: OS Up**, you can click **Remote Desktop** to log on to the Upgrade Side again.

IMPORTANT:

When you restart the Upgrade Side, the following activity log may be displayed on the Active Upgrade Console:

❌ Partner (Upgrade) state is now Hung:
❌ Unexpected state transition in Split state.

There may be an output of these activity logs even when the Upgrade Side's restart completed normally. If the following activity logs are displayed after about five minutes, select [Retry] to retry the split process so that you can continue the Active Upgrade.

ⓘ Partner (Upgrade) state is now Running OS.
ⓘ Reestablished network connection with Upgrade side.

If there is no output of those activity logs, select [Abort] to interrupt the Active Upgrade.

TIPS:

Though the Active Upgrade Console reports that the Upgrade Side operating system is up, it might take another minute or two for all services to finish loading and for login to be possible.

TIPS:

Running Software Installers, page 5-152
Viewing Active Upgrade Process Status, page 5-168
Merging the System, page 5-160
Aborting the Upgrade, page 5-166
Troubleshooting, page 5-174

Resetting the Upgrade Side Hardware

If the Upgrade Side system hangs up while the system is operating with the Split mode, you can reset the Upgrade Side hardware by clicking [Reset] button.

By resetting the Upgrade Side hardware, the system recovers.

IMPORTANT:

1   Do not reset the Upgrade Side hardware on the following cases:

- When the Upgrade Side does not reboot properly.
- When the remote connection from Production Side to the Upgrade Side does not set up properly.
  - When the Upgrade Side hangs up.

2.   If you reset the hardware while the Upgrade Side is working properly, the Upgrade side may not launch properly. If this occurs after resetting the hardware, press [Abort] button to interrupt the Active Upgrade, then retry the Active Activate from the start.

3.   Do not reset the hardware while split. If the hardware is reset while split, the spilt may fail. If this occurs, select [Abort] button to interrupt the Active Upgrade, then retry the Active Upgrade.

Managing Your Applications on the Production Side

While the system is split, you can continue to access and use your applications on the Production Side; however, **you must avoid doing any of the following on the Production Side** desktop:

- Installing or upgrading software.

- Creating or modifying any files on the system disk, including the system registry.

- Restarting the operating system.

IMPORTANT:

- Any changes you make to files on the Production Side system disks will be lost during the commit process, because the system overwrites these system disks (which contain the old version of your software) with the newer Upgrade Side disks to complete the upgrade. If you need to preserve files from the original system disks, you can save them to a data disk.

- Be careful when switching between the Production Side desktop and the remote connection to the Upgrade Side desktop. When you resume software installation or restart the system, always ensure that you are on the Upgrade Side.

TIPS:

Verifying the Upgrade Side Before Merging the System

After you have upgraded or installed software on the Upgrade Side, you can perform limited testing on the Upgrade Side system disks, as long as your activities do not require access to the following resources, which are currently unavailable:

- Network

- External storage

- Application data disks

For example, you might want to perform the following tasks before you merge the system:

Verify the presence and version number of each software package (see "Verifying the Status of Installed Software" on page 5-176).

If possible, verify that you can start the applications you installed or upgraded.

If possible, configure the settings for any applications you installed or upgraded.

If you are satisfied that everything is working correctly, you can merge the system to stop your applications on the Production Side and restart them on the Upgrade Side for final verification.

If there are any problems, you can abort the upgrade to return the system to its original state. Aborting the upgrade while the system is in split mode will not incur downtime, because your critical applications are still running on the Production Side.

TIPS:

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Merging the System

After finishing to perform the upgrade tasks on the Upgrade Side of the system, you can merge the system to verify your changes before you permanently commit them.

Merging the system:

- Stops your applications and services on the Production Side.

- Merges system resources so that the network, external storage, and application data disks become available to the Upgrade Side.

- Restarts your applications (including the Active Upgrade Console) from the Upgrade Side.

IMPORTANT:

If you execute the Active Upgrade under Backup Exec environment, merge after the split process is completed, and restart the OS on the Upgrade Side.

If you do not restart the OS on the Upgrade Side, merge process may fail. If it failed, press [Abort] to finish the Active Upgrade. After the Active Upgrade, the duplex process will be done automatically; after the duplex process is done, retry the Active Upgrade.

To merge the system

1. Verify that all upgrade processes are complete, and that you have exited any installer programs.

2. Optionally, terminate any Remote KVM or Remote Desktop sessions.

> **IMPORTANT:**
>
> If you terminate the Remote Desktop, "Disconnect" instead of "Logoff." You can remain logged on to the Upgrade Side if you want to maintain the current desktop session. After the merge, you will be using the Upgrade Side desktop.

3. Verify that the upgrade state, as reported in the status bar, is **Production Side\Split\Ready**.

   If the status is **Busy**, you must wait for the current task to complete. If it is **Broken**, you might need to abort the upgrade.

4. Click **Merge**.

> **IMPORTANT:**
>
> – Your screen might flicker and you might briefly lose control of your keyboard and mouse as the system is merged.
>
> – Do not select [Abort] button to interrupt the Active Upgrade during the merge. The disk may not be recognized from the OS. When the disk isn't recognized from the OS, go to [Disc Management] then execute [Disk Rescan].
>
> If the disk status becomes [missing] or [offline], right click the disk and select [Disk Reactivation] to verify the disk status becomes [online].
>
> – If you exit the remote desktop connection to the Upgrade Side, or if you exit the remote KVM connection to the Upgrade Side, the following error message might appear on the Active Upgrade Console of the Production Side while operating the merge.
>
> – A user must be logged into the upgrade-side console for this operation to complete
>
> – When this error message appears, complete the merge by following the below procedure:
>
> 1. Click the Remote Desktop link and login to the Upgrade Side.
>
> 2. Select [Retry] button on the Active Upgrade Console of the Production Side and retry the merge operation.

Depending on the complexity of your applications and the upgrade you performed, your applications should be backed up and running in under a minute.

After the merge process completes, the upgrade state is **Fault Tolerant\Merge\Ready**, indicating that the system is currently merged and the upgrade is ready to be committed. You can test your applications to verify that the upgrade was successful.

If the merge process fails the first time, you can click **Retry** to try again. If the problem persists, you can click **Abort** to abort the upgrade process, or see "Troubleshooting" for information about resolving the problem.

IMPORTANT:

If you selected [Abort] to interrupt the Active Upgrade after the merge process is done, OS will be restarted.

After the OS restart is completed, the interruption will be executed. The interruption may fail, however. If it failed, retry the merge process by selecting [Retry].

TIPS:

Verifying the Upgrade Side Before Committing the Upgrade

After you have merged the system, your critical applications (including the Active Upgrade Console) are running from the software on the Upgrade Side system disks. At this point, you can test the software you installed and verify the general health of the system with full access to the system's resources, including:

- Network resources

- External storage

- Application data disks

For example, you might want to perform the following tasks before you commit the upgrade:

- Verify that all of your critical applications have restarted on the Production Side (see "Verifying the Status of Application Services" on page 5-175).

- Verify that you have access to your network, external storage, and application data disks.

- Verify that client systems can reach all of the services that you NEC Express5800/ft series system provides.

- Verify that the presence and the version number of each software package (see "Verifying the Status of Installed Software" on page 5-176).

- Verify that you can launch and run any applications that you have installed or upgraded.

- Verify the configurations for your applications and the operating system, which could have been altered by software installation.

If you are satisfied that everything is working correctly, you can commit the upgrade to make the changes permanent.

If there are any problems, you can abort the upgrade to return the system to its original state. However, **aborting the upgrade while the system is in merge mode will incur downtime**, because the Active Upgrade Console must stop your critical applications on the Upgrade Side before it can restart them on the Production Side.

TIPS:

Committing the Upgrade, page 5-164
Viewing Active Upgrade Process Status, page 5-168
Aborting the Upgrade, page 5-166
Troubleshooting, page 5-174

Committing the Upgrade

When you are finished testing your applications on the merged system, and you are satisfied that everything is working correctly, you can commit the upgrade to make it permanent.

Committing the upgrade

- Rebuild the mirror of any internal RDR system disk by overwriting the original partner disk with its newer, upgraded partner disk.

- Rebuild the mirror of any internal RDR data disk by overwriting the stale partner disk with its newer, activated disk. The stale disk refer to the one that your applications have been writing data throughout the upgrade process.

- Does not restart your applications, as they are already running on the upgraded system. There is no additional downtime.

CAUTION:

You cannot abort the upgrade process after you commit an upgrade because the original state of the system is lost (overwritten) as a result of completing the upgrade process. Ensure that your system is working as expected before clicking **Commit**.

How to commit the upgrade

1. Close all non-essential applications.

2. Verify that the upgrade state, as reported in the status bar, is **Fault Tolerant\Merge\Ready**.

3. Click **Commit**.

IMPORTANT:

Your screen might flicker and you might briefly lose control of your keyboard and mouse as the system commits the upgrade.

The commit process should take only a few minutes. After it completes, the upgrade state is **Fault Tolerant\Commit\Ready**. You can click **Finish** to clean up ft series resources, as described in "Finishing the Upgrade" on page 5-167.

If the commit process fails the first time, you can click **Retry** to try again. If the problem persists, see "Troubleshooting" for information about resolving the problem.

TIPS:

Aborting the Upgrade

If necessary, you can abort the Active Upgrade process and restore the system to its original state at the split mode or the merge mode of the upgrade process **prior to committing the upgrade**.

CAUTION:

You cannot abort the upgrade process after you commit an upgrade because the original state of the system is lost (overwritten) as a result of completing the upgrade process.

When you abort an upgrade, the Active Upgrade Console:

- Cancels the current Active Upgrade operation.

- If applicable (and if your system is in the merge state), initiates a system restart.   It shuts down the Upgrade Side and restarts the system from the Production Side, which automatically restarts your applications from your original Production side system disks.

- If applicable, reestablishes the mirror of any internal RDR system disk by overwriting the upgraded partner disk with the original partner disk.

- If applicable, reestablishes the mirror of any internal RDR data disk by overwriting the stale partner disk with its newer, live partner disk (the disk to which your applications have been writing data throughout the upgrade process).

- If applicable, bring the Upgrade Side online to enable fault-tolerant, duplex mode.

To abort an upgrade, click the **Abort** button on the **Active Upgrade** page, the **Split System** page, or the **Merge System** page.

IMPORTANT:

Your screen might flicker and you might briefly lose control of your keyboard and mouse as the system recovers its original state.

The abort process should take only a few minutes. When the process completes, the upgrade state is **Fault Tolerant\Abort\Ready**. You can click **Finish** to clean up ftServer resources, as described in "Finishing the Upgrade" on page 5-167.

If the abort process fails the first time, you can click **Retry** to try again. If the problem persists, see "Troubleshooting" for information about resolving the problem.

TIPS:

Finishing the Upgrade, page 5-167
Viewing Active Upgrade Process Status, page 5-168
Verifying If RDR Disks Are Resynchronizing, page 5-178
Troubleshooting, page 5-174

Finishing the Upgrade

To complete the Active Upgrade process and clean up ftServer system resources after committing or aborting an upgrade, click **Finish** on the **Commit Upgrade** page or **Abort Upgrade** page.

The finish process should take only a few minutes. When the process completes, the upgrade state is **Fault Tolerant\Idle\Ready**.

If the finish process fails the first time, you can click **Retry** to try again. If the problem persists, see "Troubleshooting" for information about resolving the problem.

On the **Finish** page, upon successful completion of the Active Upgrade process, you can:

- Click **Exit** to close the Active Upgrade Console.

- Click **Save Log** to sage the activity log to a file.

- Click **Active Upgrade** in the navigation bar to initiate another readiness test and upgrade with the same configuration.

- Click **Configuration** in the navigation bar to create, edit, or load another configuration file.

IMPORTANT:

Though the Active Upgrade process is complete, your RDR disks continue to resynchronize in the background. If you intend to initiate another upgrade process, you must wait for the resynchronization to complete before you do so. See "Verifying If RDR Disks Are Resynchronizing" on page 5-178 for more information.

TIPS:

Viewing Active Upgrade Process Status, page 5-168
Verifying If RDR Disks Are Resynchronizing, page 5-178
Troubleshooting, page 5-174

Viewing Active Upgrade Process Status

You can view the status of the Active Upgrade process at any point during the upgrade. The Active Upgrade Console indicates status in two ways:

-

-

Activity Log

The activity log shown below, which reports details about each upgrade operation, is displayed in the main window of the Active Upgrade Console after you have initiated a readiness test or upgrade session.

Activity Log (in Active Upgrade Console)

If you want to check the status of the upgrade process when you are logged on to the Upgrade Side of the system (while in split mode), you can also double-click the Active Upgrade icon ( ) in the system tray to open the remote activity log shown below.

Remote Activity Log

IMPORTANT:

You can only view status in this window. To control the remaining steps of the Active Upgrade process, you must minimize or close the connection to the Upgrade Side and use the Active Upgrade Console on the Production Side.

Table below describes the general meaning of activity log entries that appear in the local and remote activity logs.

Activity Log Entries

Icon	Text Color	Severity	Description
	Green	Success	Task completed without error
	Black	Pending	Task is in progress
	Black	Information	Task information, no action necessary
	Black	Warning	A problem that should be addressed, but will not block an upgrade
	Red	Error	A problem that must be corrected before continuing with upgrade

Some upgrade items are collapsed into a single line. To display all of the associated items, click on the expand (+) button to the left of the item. To collapse them again, click on the collapse (-) button to the left of the item.

Double-click on any item in the activity log to open a detail window with more information about that item.

Activity Log Detail

In the detail window, you can click the **Previous** and **Next** buttons to review other items of the same severity. For example, if you are viewing an error, you can click **Next** to see the next error item. To change the severity level of the items you want to review, select an option from the **Show severity** pulldown menu. (A severity type will be unavailable if there are currently no items of that severity in the activity log).

If necessary, you save the items from the activity log in the Active Upgrade Console to a file. See "Saving the Activity Log to a File" on page 5-174 for more information.

TIPS:

Status Bar

The status bar (below figure), which is located at the bottom of the Active Upgrade Console window, reports a quick summary of the status of the upgrade.

Status Bar

1   Configuration file name

2   Hardware State (Table 1)

3   Upgrade State (Table 2)

4   Operational State (Table 3)

5   Partner State (Table 4)

The Hardware State reports whether or not your critical applications are running in lockstep. The below table describes the possible hardware states.

Status: Hardware State

Hardware State	Description
Fault-tolerant	The system is duplexed.
Production Side	The system is currently running in split mode, and your applications are running from the Production Side (the original copy of your software). The Upgrade Side is available for installation tasks.

The Upgrade State reports the stage of the upgrade your system is entering or has entered. The below table describes the possible upgrade states.

Status: Upgrade State

Upgrade State	Description
Idle	The current upgrade session is idle. The Active Upgrade process has just finished, or it has not been initiated yet.
Prepare Split	The Active Upgrade Console is preparing to split the system by running a final readiness check and additional background tasks.
Split	If the operational state is **Ready**, the system is running in split mode.

Upgrade State	Description
	Otherwise, the Active Upgrade Console is in the process of initiating split mode.
Prepare Merge	The Active Upgrade Console is preparing to merge the system by running additional readiness tests and background tasks.
Merge	If the operational state is **Ready**, the system is merged. Otherwise, the Active Upgrade Console is in the process of merging the system.
Commit	The Active Upgrade Console is in the process of committing your changes (making them permanent).
Abort	The upgrade process has been aborted, and the Active Upgrade Console is in the process of restoring the system to its previous state.

The Operational State reports the status of the last operation that was requested. Table   describes the possible operational states.

Table 3   Status: Operational State

Operational State	Description
Ready	The previous operation has been completed successfully. The Active Upgrade process is ready to enter the next upgrade state.
Busy	The current operation is still in progress. Allow time for the operation to complete.
Broken	The Active Upgrade Console could not complete the current operation. Check the activity log for errors. You must correct the errors and click **Retry** to complete the operation, or click **Abort** to abort the current upgrade session.

The Partner State reports the status of the partner system. For example, while the system is in split mode, the Active Upgrade Console is running on the Production Side, and this field reports the health of the Upgrade Side of the system. Table 4 describes the possible partner states.

Table 4   Status: Partner State

Partner State	Description
DC On	The partner system operating system is shut down, but the system still has standby (housekeeping) power.

Partner State	Description
DC Off	The partner system operating system is shut down and standby power is off.
BIOS POST	The partner system is performing a BIOS Power On Self Test (POST).
Hung: BIOS POST	The partner system hung in the BIOS POST.
OS Booting	The partner operating system is booting.
Hung: OS Booting	The partner system hung in the boot process.
OS Up	The partner operating system is up. (However, the system might not be available for use until other system resources finish loading.)
Hung: OS Up	The partner operating system is hung.
OS Rebooting	The partner operating system is rebooting.
Hung: OS Rebooting	The partner system hung while rebooting.
OS Shutting Down	The partner operating system is shutting down.
Hung: OS	The partner system hung while it was shutting down.
OS Crashed	The partner operating system crashed.
OS Shut Down	The partner operating system finished shutting down, but the system is still powered on.

TIPS:

Troubleshooting

If necessary, you can collect information about the Active Upgrade process and resolve problems by:

- Saving the activity log to a file.

- Viewing the status of your application services

- Viewing the status of your installed software.

- Verifying if RDR disks are resynching.

- Learning about general problems and solutions.

- Getting help and support.

Saving the Activity Log to a File

If necessary, you can save the contents of the activity log to a file for later viewing.

To save the activity log to a file

1. Right-click on the activity log, and select **Save to File** in the shortcut menu.

2. Next to **Save in**, select a folder in which to save the file.

3. Next to **File name**, type a name for the file. (Activity log files are saved in XML format, which you can view in Internet Explorer. The .xml extension is added automatically.)

4. Click **Save**.

   NOTE:

   If you have just completed an upgrade session, you can also save the activity log by clicking **Save Log** on the **Finish** page.

TIPS:

Viewing Active Upgrade Process Status, page 5-168
Troubleshooting, page 5-174

Verifying the Status of Application Services

At various stages of the Active Upgrade process, you can optionally verify the status of services you specified for control on the **Application Services** page of the Active Upgrade Console.

To verify the status of a service

1. Right-click **My Computer** on your desktop (or in the **Start** menu).

2. Select **Manage** from the shortcut menu. **Computer Management** is displayed.

3. If necessary, click **Services and Applications** to expand it.

4. Click **Services** to display the below-shown Service Control Manager in the right pane of the window.

5. Search for a service in the list and view its current **Status** and **Startup Type** in the fields next to the service name.

For example, while the system is in split mode, any service you selected for control by the Active Upgrade Console should be stopped (blank **Status** field) and its Startup Type should be **Disabled** on the Upgrade Side of the system, as shown with the MSSQLSERVER service in.

Service Control Manager

TIPS:

Managing Critical Applications During the Upgrade Process, page 5-105
Selecting Application Services to Control, page 5-129
Viewing Active Upgrade Process Status, page 5-168
Troubleshooting, page 5-174

Verifying the Status of Installed Software

While you are running in split or merge mode, or after you have finished the Active Upgrade process, you might want to verify the status of the software packages that you installed.

If necessary, you can view a list of most of the programs present on your system in the **Add or Remove Programs** control panel shown below.

Add or Remove Programs Control Panel

If you installed any Windows updates, select the **Show updates** check box in the control panel to display the updates in the list of programs.

NOTE:

If your system is in split or merge mode, remember to view the **Add or Remove Programs** control panel **on the Upgrade Side**. The same control panel on the Production Side will not list the new software you installed on the Upgrade Side.

TIPS:

Running Software Installers, page 5-152
Viewing Active Upgrade Process Status, page 5-168
Troubleshooting, page 5-174

Verifying If RDR Disks Are Resynchronizing

When you complete or abort the Active Upgrade process, the system reestablishes the mirrors between the RDR partner disks in each CPU- I∕O enclosure. If you intend to initiate another upgrade process, you must wait for the resynchronization to complete before you do so.

You can tell if a disk is resynching by viewing the LEDs on the front panel of the disk. For information about interpreting the LEDs, see "Disk Operations Using the RDR (Rapid Disk Resync) Function" in Chapter 3, "Windows Setup and Operation."

You can also view the status of your disks using one of the following methods:

- Run a readiness check. On the Active Upgrade page, click Retry. If the disks are still resynching, the upgrade state will be reported as **Fault Tolerant\Idle\Broken** and the activity log will display errors indicating that the disks are not ready.

- Verify the disks on the Disk Selection page. Any volume that is in red is simplexed (and thus, probably still resynching). When a disk volume is only green, it is duplxed and you can start another upgrade.
  For more about the disk status on the **Disk Selection page**, see "Selecting Disks to Upgrade" on 5-126.

To view the status of an RDR virtual disk in RDR Utility

1.   On RDR Utility, click **Logical Disk Information**.

2.   Click one of the **RDR Virtual Disk** items (RDR Virtual Disk x).

3.   Check the value of the **Status** property, which displays **Resync *nn*%** (where *nn* is the percentage completed) while the disk is resynchronizing. When the resync process is finished, the value is **None**.

Ensure that the value of the **Status** property for all RDR Virtual Disks is **None** before you retry the Active Upgrade process.

TIPS:

Selecting Disks to Upgrade, page 5-126
Performing a Readiness Check, page 5-142
Viewing Active Upgrade Process Status, page 5-168
Troubleshooting, page 5-174

General Problems and Solutions

The table below describes some common problems that could prevent your system from passing the readiness check.

IMPORTANT:

Never perform hardware maintenance, such as removing and replacing system components, while the Active Upgrade process is running. If you experience a problem that prevents the Active Upgrade process from completing successfully, you should always be able to abort the upgrade session to restore your system to its original state.

Troubleshooting: Readiness Check

Error	Action
IO board *nn* is unsafe to pull	Verify that all critical system resources (including disks, Ethernet PCI adapters, and VTMs) are configured correctly and duplexed. See "Prerequisites" on page 5-102 for more information.
RDR disk is not duplexed	If you recently ran an upgrade session, wait for the RDR resynchronization process to complete before running another upgrade session. See "Verifying If RDR Disks Are Resynchronizing" on page 5-178 for more information.
Embedded NIC not teamed	Use the PROset utility to configure your Ethernet PCI adapters into teams. All embedded Ethernet PCI adapters must be teamed. See "Prerequisites" on page 5-102 and "Recommendations" on page 5-104 for more information about configuring Ethernet PCI adapters.
No IP address on Upgrade ready team	Use the Network Connections control panel to assign an IP address (preferably a static IP address) to the Ethernet team. See "Prerequisites" on page 5-102 and "Recommendations" on page 5-104 for more information about configuring Ethernet PCI adapters.
Team does not have link on both sides	Ensure that an embedded Ethernet team has at least one adapter in each CPU- I/O enclosure with an active network link. Verify that the network cables are plugged in on both sides, and that the Ethernet team has a valid IP address. See "Prerequisites" on page 5-102 and "Recommendations" on page 5-104 for more information about configuring Ethernet PCI adapters
Active Upgrade may fail. Check DHCP server.	The Active Upgrade Console cannot obtain IP addresses from your DHCP server. If possible, assign static IP addresses to your Ethernet teams and VTMs to avoid problems during the Active Upgrade process.

The following tables describes some common problems with custom actions.

Troubleshooting: Custom Actions

Error	Action
The executable *filename* does not exist.	Ensure that the executable file associated with your custom action is located in the directory you specified during the configuration process. Also, ensure that the custom action is located on a system disk, otherwise the Upgrade Side will lose access to the executable while the system is in split mode.
Custom action failed with exit value *n*	Check the output for the custom action for errors. See "Viewing Standard Output and Error Stream" on page 5-138 for more information. You must correct the problem and click **Retry** in the Active Upgrade Console to retry the current upgrade request (which also runs the custom action again). The Active Upgrade process will not continue until the executable for your custom action runs successfully. If possible, test and debug the executable outside of the Active Upgrade process. Ensure that it terminates with exit value 0 and that it completes in a timely manner.

Troubleshooting: Miscellaneous Problems

Problem	Action
Active Upgrade Console fails to start	Wait a minute, and try to start Active Upgrade Console again. If the problem persists, it might mean that the Active Upgrade Console cannot communicate with related services on your local system. If your system is running a network firewall solution, check the firewall logs for blocked communications and explicitly add these items to your trusted zone. For information about configuring Windows Firewall, see "Configuring Windows Firewall for the Active Upgrade Process" on page 5-108.
Remote KVM browser window appears, but does not open connection	Ensure that Java™ 2 Runtime Environment (JRE) is installed and running. Also ensure that you have added the VTM console Web address to your Trusted Sites list, and that you have allowed blocked Web-based content. See **"Connecting to the Upgrade Side with Remote KVM"** on page 5-149 for more information.

Problem	Action
Failed to disable PCI device: QLogic Fibre Channel Adapter	If you have installed QLogic SANsurfer Fibre Channel HBA Software to upgrade the BIOS in your host bus adapter, you should uninstall this utility when you are done upgrading the BIOS. If the utility remains on your system, it may retain access to storage system resources and prevent certain storage operations. In this case, the Active Upgrade Console cannot split system resources because it cannot disable the HBA on the Upgrade Side. To resolve the problem, you must abort the upgrade, uninstall SANsurfer, restart the system (or stop the SANsurfer service), and restart the upgrade process.
The underlying connection was closed: Unable to connect to the remote server	If your system is running a network firewall solution, check the firewall logs for blocked communications and explicitly add these items to your trusted zone. For information about configuring Windows Firewall, see **"Configuring Windows Firewall for the Active Upgrade Process"** on page 5-108.
A connection attempt failed because the connected party did not properly respond.	
Unable to see the disc that should exist in [Disk Managing] in [Computer Management].	Go to [Disk Management] and execute [Disk Rescan]. When the disk status appears [Missing] or [Offline], right click the disk and select [Disk Reactivation] to verify the disk status becomes [Online].

TIPS:

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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 3.5-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.

Making Backup Copies

NEC recommends you make backup copies of your valuable data stored in hard disks of the server on a regular basis. For backup storage devices suitable for the server and backup tools, consult with your sales agent.

When you have changed the hardware configuration or BIOS configuration, select "System Information Management" and then "Save" of the Off-line Maintenance Utility to make a backup copy of the system information.

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.

Cleaning Tape Drive

Dirt on the tape head may be a cause of unsuccessful backup and damage to tape cartridge. Clean the tape head regularly using a cleaning tape. For procedure and interval of cleaning as well as lifetime of a tape cartridge to use, see instructions included with the tape drive.

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

```
TeDoLi (TEst & Diagnosis On Linux) Ver001.00 (Build020901.1.1m)          Test window title
┌──────────────────── Test End ────────────────────┐
│ Start 10:06:58   End 10:09:58   Pass 000:03:00   TestTime 000:03:00     Test result
│ Test End:  NormalEnd      03  AbnormalEnd   00   ForceEnd    00
│
│ ┌──────────────────────────────────────────────┐
│ │ <System>
│ │ MEM      Memory                16 count    NormalEnd
│ │ CACHE    Cache                 49 count    NormalEnd
│ │ <SCSI>
│ │ HDD_02:000  DK32DJ-36W         89 count    NormalEnd            Test summary
│ │                                                                 window
│ │
│ │
│ │
│ └──────────────────────────────────────────────┘
│
│ [Enter] Detail Information    [ESC] Return to Enduser Menu
└───────────────────────────────────────────────────┘
```

Guideline

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. It can be saved on a floppy disk. To save it on a floppy disk, insert a formatted floppy disk to the floppy disk drive, 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

```
                              Language selection
     ┌─ Language selection ─┐
     │ Japanese *** default ***
     │ English
     │ Return to previous menu
     └──────────────────────┘



                        Automatic select at  5 seconds



Select language which you want to use by the cursor key.
```

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.

```
                    TOOL MENU
     ┌────────────────────────────────┐
     │ Maintenance Utility
     │ BIOS/FW Updating
     │ ROM-DOS Startup FD
     │ Test and diagnostics
     │ System Management
     │ Return to previous menu
     └────────────────────────────────┘

                 Press [Tab] to edit options
These utilities are for maintenance and configuration.
─System information is displayed, managed, and set in "Maintenance Utility".
─BIOS and various firmwares are renewed in the "BIOS/FW Updating".
─ROM-DOS system can boot from a floppy disk made at "ROM-DOS Startup FD".
─This computer and connected devices can be examined at "Test and diagnostics".
─BMC information is displayed and set in "System Management".
  (Only when BMC is supported.)
```

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.

TO THE ACCIDENT OF PCI MODULE

You may encounter the following error during the mirroring procedure in a case such as after module is added; however, hard error does not occur.

Check whether the following error log is added.

If the error log is added, perform the following procedure.
If it is not hard error, you can recover. If this procedure is failed, contact your Administrator or a member of the Administrators group.

Procedure to Confirm

Check the following message from the event log.

Note: Sample of PCI module 1 (ID: 10).

Source ： srabid
Event ID ： 16395

Procedure to Recover

If access of system is high, cancel the procedure or reduce the access.
(1) Clear MTBF by PCI module and stop/start of PCI module by ft server utility.

   Procedure
      1.   Cancel the procedure or wait for finish of the procedure.
      2.   Clear of MTBF by PCI module 1 (ID:10).
      3.   Stop the PCI module 1.
      4.   Start the PCI module 1.

(2) Clear MTBF by the PCI module 1.

(3) Stop of PCI module 1.

(4) Start of PCI module 1.

Procedure to Check

Check whether the following error is added on system event log.
If following events are added, the procedure is performed correctly.

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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]

ESMPRO/ServerManager

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 2–17 "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.

Windows Server 2003, Enterprise Edition Error Messages

If a fatal error (e.g., a STOP or system error) occurs after Windows Server 2003, Enterprise Edition starts, the screen of the display unit turns blue and displays detailed error messages.

The screen background is "blue".

> **STOP: C000021A (FATAL SYSTEM ERROR)**
>
> **The Windows logon process.. System process terminated.**
>
> **Unexpectedly with a status of 0x00000001 (0x00000000 0x00000000).**
>
> **The system has been shutdown.**
>
> **crashdump : initializing miniport driver**
>
> **crashdump : dumping physical memory to disk**

Take notes of the messages displayed on the screen, and call your sales agent.

If a fatal error occurs, the server automatically executes memory dump processing and saves the memory dump data in an arbitrary directory (see the end of this chapter). The maintenance personnel of your sales agent may ask you to provide this data. Thus, copy the file into a medium (e.g., DAT) to be ready to pass it to the maintenance personnel.

IMPORTANT:

A message may appear indicating that virtual memory is insufficient when you restart the system after a STOP or system error has occurred. Ignore the message and start the system. If an error such as a stop error of the OS occurs, the normal dump function may run instead of the quick dump function depending on the system status. However, the memory dump file can be used for failure analysis equivalent to that of the quick dump function.

TIPS:
Before copying the file into a medium, start the Event Viewer to confirm that the Save Dump event log is included in the system event logs and the memory dump has been saved.

The following message may be displayed during usage.

"Your system is low on virtual memory. To ensure that Windows runs properly, increase the size of your virtual memory paging file. For more information, see Help."

When this message is displayed, extend a physical memory following the procedure below.

1. Add a physical memory

2. Change the configuration of the paging file (Change more than < physical memory capacity $\times$ 1.5 >)

The system also displays a warning message if an internal device or peripheral equipment (e.g., disk, network, or printer) encounters an error. Take notes of the message, and call your sales agent.

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.

TROUBLESHOOTING

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 on 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.

The screen turns blue during OS boot:

→ Wait for the period of time you set at BIOS [Boot Monitoring]; after the boot module is automatically swapped, the server will be rebooted and the OS will start up.

POST fails to complete:

☐   Is the DIMM installed?

→ At least one DIMM is required for operation.

☐   Is the memory size large?

→ The memory check may take a time if the 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.

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, 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.

☐   Is SCSI controller (including options) configuration correct?

→ If the sever has an optional SCSI controller board and SCSI devices are hooked up to the server, make correct settings by the SCSI controller board's SCSI BIOS utility. For details, see manuals included with the SCSI controller board.

CPUs not in Duplex mode:

> → Check if the memory configuration is correct.

> → Check if third-party CPUs or memory (DIMM) are used.

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.

> □   Does the server have drivers installed?

> > → Refer to the manual that comes with your OS to check that the keyboard and mouse drivers are installed. (These drivers are installed along with the OS.) Some OS allow you to change the keyboard and mouse settings. Refer to manual that comes with your OS to check that the keyboard and mouse settings are correct.

Screen freezes, keyboard and mouse don't work:

→ If the amount of memory is large, it takes time to copy the memory in dual mode and the system stops working temporarily during the copying, but it is not system trouble.

Message "New Hardware Found" appears:

→ Such a message may appear at the system startup or when a CPU/IO module is replaced and incorporated into the system. This is due to the server's operating specifications and does not pose any problem.

Fail to access (read or write) to the floppy disk:

□   Does the floppy disk drive contain a floppy disk?

→ Insert a floppy disk into the floppy disk drive until it 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 CD/DVD-ROM:

□   Is the CD/DVD-ROM properly set in the CD/DVD-ROM drive tray?

→ The tray is provided with a holder to secure the CD/DVD-ROM. Make sure that the CD/DVD-ROM is placed properly in the holder.

□   Is the CD/DVD-ROM applicable to the server?

→ The CD/DVD-ROM for Macintosh is not available for use.

Fail to access the hard disk:

□   Is the hard disk applicable to the server?

→ Operation of any device that is not authorized by NEC is not guaranteed.

□   Is the hard disk properly installed?

→ Make sure to lock the hard disk with the lever on its handle. The hard disk is not connected to the internal connector when it is not completely installed (see Chapter 8). When the hard disk is properly installed, the drive power LED for the hard disk is lit while the server is powered.

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 (or the other bootable DVD/CD-ROM) in the optical disk drive?

→ Take out the DVD (or the other bootable DVD/CD-ROM) and restart the server.

☐   Is the OS damaged?

→ Use the recovery process of the OS to attempt to recover the damaged OS.

OS behavior is unstable:

☐   Have you updated your system?

→ For update procedure, see the separate volume "User's Guide (Setup)."

The system does not operate according to the configured settings of "Automatic Restart" at the occurrence of error.

→ The system may or may not restart automatically even if the "Automatic Restart" settings are made at occurrence of an error is set. If the system does not restart automatically, restart it in manual mode.

The power cannot be turned off while the blue screen of Windows Server 2003, Enterprise Edition is displayed.

→ The forced power-off (forced shutdown) procedure is necessary to turn off the power with the blue screen displayed. Keep pressing the POWER switch for about 4 seconds. Pressing the POWER switch quickly does not turn off the power in this case.

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 service already configured?

→ 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.

Fix the transfer speed by using Device Manager. Select and right-click the network adapter to change the transfer speed from the tree on Device Manager, and select [Properties] from the displayed menu. When the properties window appears, select the [Link] tab, and select the item that matches to the connected HUB from the list box of [Speed and Duplex]. If you click [OK], configuration selected in [Speed and Duplex] will be effective.

Icon of drive A is changed to that of removal disk:

→ Does not cause any problem.

Machine repeats rebooting at startup:

☐   Is CHKDSK executed at machine startup?

→   Open the utility of the BIOS setup at rebooting and change the following settings:

(Change BIOS settings)
Change [Server] - [Monitoring Configuration] - [OS Boot Monitoring] to [Disable].
(For details, see page 4-24 "Monitoring Configuration.")

* After completion of CHKDSK, restart the machine and change the above setting back to [Enable] and continue the operation.

CHKDSK is executed in the following conditions:
(1)   CHKDSK is scheduled to be executed at next system startup
(2)   Corruption of file system is detected since the previous startup until shutdown
(3)   Inconsistency (corruption) of file system is detected while mouting at system startup

☐   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 4-24 "Monitoring Configuration.")

Disk access LEDs on the disks are off:

→ The LEDs may seem to be off when an excessive amount of access causes the frequent blinking. Check if the LEDs are blinking green when the access is reduced.

Unavailable disks are displayed on Disk Management:
Follow the instruction below:

Disk Status	Description	Action
Disk 3 Dynamic Foreign	A message [Foreign] is displayed when the dynamic disk used on another system is mounted.	[To use data of the disk] Import the disk referring to Chapter 3 "Windows Setup and Operation." [To make the disk usable] Initialization is required to use this disk. Initialize this disk to convert it to a usable disk. **<Note>** The data on disks are lost when initialized. Make sure to back up the data before initializing disks.
Missing Dynamic 6.01 GB Offline	A message [Missing] is displayed when the dynamic disk is broken or removed.	Delete the mirror on the disk when mirror volume is on missing disk. After deleting the mirror, right-click [Missing] disk and execute [Remove disk].
Disk 2 Unknown 33.87 GB Not Initialized	A message [Not Initialized] is displayed when there is no signature on the disk.	Right-click on the disk and execute [Initialize Disk] to convert it to a usable disk.

CPU load ratio of SNMP Service (snmp.exe) increases:

→ While monitoring the server from NEC ESMPRO Manager, the CPU load ratio of SNMP 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 SNMP 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 SNMP 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.

SNMP Service caused hang:

→ SNMP Service has a module called "SNMP Extended Agent." This module may be registered when you install some software that uses SNMP Service. If you start SNMP Service, SNMP Extended Agent is also loaded at the initialization. However, if the initialization is not completed within a specified period, SNMP 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 SNMP Service.

Pop-up message of esmcmn.exe is displayed when starting the system:

→   The following pop-up message may be displayed when you restart the system which
    NEC ESMPRO Agent is installed to and removal drives such as MO and
    DVD-RAM are mounted on, without closing Windows Explorer, after displaying the
    contents of media and removing the media by the software eject (by right-clicking
    the DVD drive on Windows Explorer and selecting [Eject]) The message (the drive
    name) displayed varies depeneding on the systems.
    If the pop-up messages below are displayed, click [Cancel] or [Continue] to close
    the dialog box. If you do not close the dialog box, you cannot start the Workstation
    service and related services, causing unstable operation of the system. Also, if you
    restart the system, execute it after terminating the program such as Windows
    Explorer which displays a media.

    \<Example\>

Memory dump (debug information) cannot be collected when a failure occurs:

☐   Is there any available storage space on a storage location?

→   Specify the drive in which there is an available storage space of more than a
    memory size on the server plus 12 MB (more than 2048 plus 12MB if a memory
    size is more than 2GB).
    For details, see "Set Memory Dump (Debug Information)" of "Step 14: Make
    Settings for Failure Management" in Chapter 4 "Windows Setup" in the separate
    User's Guide for setup.

☐   Is [Initial size] of the paging file of the OS partition smaller than [Recommended]?

→   If a value smaller than the [Recommended] value is set for [Initial Size] of the
    paging file, accurate memory dump (debug information) may not be collected. Be
    sure to create the file in the above size in the OS partition.
    For details, see "Set Memory Dump (Debug Information)" of "Step 14: Make
    Settings for Failure Management" in Chapter 4 "Windows Setup" in the separate
    User's Guide for setup.

Command prompt cannot be displayed in full screen:

In NEC Express5800/ft series, you cannot switch command prompt to full screen mode. Also, you cannot execute applications that use command prompt full screen mode. When you attempt to switch to full screen mode, the message below may appear. Click [OK] and close the window.

<Example message>

The video device failed to initialize for fullscreen mode.

Exclamation mark "!" appears on some devices in the Device Manager:

There may be some device drivers with the following exclamation mark "!" on the Device Manager after setting up. However there is no effect on the operation as it is due to the specification of the server.

-System devices   − Stratus Disk Device
-Storage Controllers − Stratus Virtual Host Bus Adapter Device

Warning message appears in POST after implementing ft Remote Management Card:

☐   Did you set "Initialize Remote Management Card"?

H/W Configuration of BMC is corrupted.
!! Update BMC H/W Configuration by configuration tool!!
!! Refer to BMC Configuration manual !!

If the message above appears, press **F1** key or wait for a while. Then POST proceeds. Insert NEC EXPRESSBUILDER DVD attached to the server to the DVD-ROM drive to start NEC EXPRESSBUILDER. Select [Tools] - [Initialize Remote Management Card] from its main menu to write the sensor information specific to the server to the card.

A CPU/IO module cannot be integrated:

When a componet fails and is reintegrated, the following message may be recorded to the system event log and the process is stopped. Such event indicates that the component's MTBF is below the threshold and it is judged that repair is necessary. Thus the reintegration process cannot be completed. Generally replacement of the component will be required, so contact your sales representative. If reintegraating the component without repair is required for some reason, consult your sales agent. It is possible to perform reintegration forcefully.

Source: srabid
ID: 16395
Description: x is now STATE BROKEN / REASON_BELLOW_MTBF ("x" is a
               device number.)

When you integrate a PCI module when exchanging, starting and diagnosing the PCI module, follwing events may be recorded on [System] in [Event Viewer], and the duplex process may fail:

Source: srabid
ID: 16474
Description: Diagnostics failure of XX: 'IO GbEnet OUI Verification 1, D821'
                (Ftn=xxxx Info=xxxx,xxxx).
Source: srabid
ID: 16395
Description: XX is now STATE BROKEN/REASON_DIAGNOSTICS_FAILED

"XX" refers to the PCI module ID. If it is PCI module 1, it is shown as "10"; if it is PCI module 2, it is shown as "11." As to "xxxx," the value differs depending on circumstances when errors occur.

If the above events are recorded, follow the below prcedure to integrade the PCI module.

(1)   Select the PCI module that failed to integrate on the ft Server Utility.
(2)   Select [Clear] under [MTBF clear].
(3)   Select [Start] to start the PCI module.

Screen under changing (distorted display) can be seen when screen resolution is changed:

If screen resolution is changed while the entire system is under high load, screen under changing (distorted display) may be seen.
This is because screen update is taking time to complete due to high load in the system. This is not because an error is occuring.
The screen will return to normal if you wait awhile.

Unable to recognize the server from a managing PC:

☐   Did you configure [Initialize Remote Management Card]?

→Start the server-accessory 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.

☐   Did you set NEC ESMPRO Agent to monitor the server?

→Change the ESMPRO setting. Start NEC ESMPRO Agent in the Windows
control panel, then go to [Express5800 Server] - [Monitor] from [System] tab,
then click the check box. ([Unmonitored] is selected by default) After
changing the setting, the server monitoring starts automatically. You do not
have to reboot the server, but you need to restructure the tree if you still
cannot monitor the server.

☐   Is network connection restricted by the firewall or thegateway?

→ 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 Chapter 4 [Remote Management Function] - [BMC
Configuration] - [Network Configuration], 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.

Forgot login name/password for the Remote Management Function on the web browser:

→ Refer to Chapter 4 on BMC configuration jumper. By changing the jumper position, the BMC configuration including the password returns to the factory default setting.

IMPORTANT:

After the operation, the BMC configuration for connecting to the DianaScope and to the server will be lost. If you are already using the DianaScope, save the configuration on FloppyDisk before this operation, then configure again. You can change/save the BMC configuration on the system management function of DianaScope or EXPRESSBUILDER.

On the Network Connections screen, the numbering of the Local Area Connection doesn't begin from "1":

→ If you use windows server 2003, on the Network Connections screen, the numbering of the Local Area Connection does not begin from "1". This is because of the product feature and there this affects nothing on the operation. If you need to change the Local Area Connection name, right click the icon on the Network Connections screen and select [Change name].

Wake On LAN does not function:

☐ Is the AC power supplied to both AC cables?

→If the AC power supplied to only one of the AC cabled, Wake On LAN may become unavailable. Supply the AC power supply to both of the AC cables, and press the power switch to start the system.

☐ Is the network adapter configured on OS?

→On the OS, go to [Start] - [Management Tool] - [Computer management] and select the Device Manager. Double click [Stratus emb-82576 2-Port Gigabit Adapter #n] under the network adapter, then select the following option from [Power Management] tab:

Wake on Magic Packet from power off state

TIPS:

Wake On Magic packet is unavailable even it it is checked.

☐ Is Hub/Client fixed as 1000M?

→Check the following configurations:

－Set the Hub as "Auto-Negotioation."
－Set the Client as "Auto-negotiate best speed."

IMPORTANT:

For both Hub/Client, you cannot function Wake On LAN from standby with the 1000M fixed configuration.

☐ Do you happen to be sending Magic Packet to only one of the duplexed LAN?

→If you use Wake On LAN under duplexed LAN, you need to send Magic Packet to all of the duplexed LAN pair(s).

Event Log

The following system event of ACPI is logged.

→ This event may be registered during the re-installation, it is not a problem in operating the system.

Type   :Error
Source   :ACPI
Event ID   :6

Description :ACPI BIOS does not contain an IRQ for the device in PCI slot 1, function 0.

Please contact your system vendor for technical assistance.

"The NMS Service terminated unexpectedly." is recorded in the system event log:

→ Although the following log may be recorded in the system event log when starting the system, or after exchanging PCI modules, there is no real problem on operation. Change of a setup with PROSet II will become invalid if NMS service stops, but you can change a setup normally because NMS service will be automatically started when PROSet II is started.

"Source: Service Control Manager
Event ID: 7031
Description: The NMS service terminated unexpectedly. This has occurred 1 time(s). The following corrective action will be taken in 0 milliseconds: No action."

iANSMiniport-related logs are recorded in the system event log:

→ The logs of the source "iANSMiniport" are the logs about the duplex of the network. The following logs may be recorded in the system event log after starting the system or after setting duplex, but there is no problem on operation.

Source: iANSMiniport
Type: Warning
Event ID: 35
Description: Initializing "Virtual Team Adaptor" that lack adapter "Number of missed adaptors." Check if all adapters exist and function properly.

Source: iANSMiniport
Type: Warning
Event ID: 13
Description: "Physical Adaptor" is invalid in the team.

Source: iANSMiniport
Type: Warning
Event ID: 11
Description: The following adapter link is not connected: "Physical Adaptor."

Source: iANSMiniport
Type: Error
Event ID: 16
Description: "Virtual Team Adaptor": the last adapter lost the link.

The team network lost the connection.

Source: iANSMiniport
Type: Warning
Event ID: 22
Description: The primary adapter did not detect the following probe: "Physical
               Adaptor." Reason: The team may be divided.

The log above gets output in the process of system start up or dual mode setting.
When the log is recorded, there is no problem to the system by the above warning
if the status of the adapter in the team is "Active" or "Standby." For the status of
the adapter, check in properties of the team adapter from the device manager.

ESMCommonService related log is recorded in the system event log:

→   Following event log is recorded while the system operation in some cases. The log
     indicates detection of an event that is not critical event for the server operation,
     and the event is amendable. This doesn't affect the system as long as the event
     never occurs repeatedly.

Source: ESMCommonService
Type: Warning
Event ID: 1309
Description: ECC 1 bit error occurred on the system bus.

EvntAgnt log is recorded in the application event log:

→   This event does not have any influence to the system not to SNMP services. Thus
     no measurement is required.

Source: EvntAgnt
Event ID: 1003
Description: TraceFileName parameter not located in registry; Default trace file
               used is .

Source: EvntAgnt
ID: 1015
Description: TraceLevel parameter not located in registry; Default trace level
               used is 32.

Event log which warn CPU load monitoring is registered:

→   If NEC ESMPRO Agent cannot get performance information from the OS due to a temporary resource shortage or high load ratio on the system, it will record the following event log. However, there is no real problem on operation. (In the description, Y and X represent alphanumeric characters.)

Source: ESMCpuPerf
Type: Information
Event ID: 9005
Description: Cannot get system performance information now (YYYY Code=xxxx).

If NEC ESMPRO Agent cannot get information, it will treat the load ratio as 0%. So, if NEC ESMPRO Agent cannot get information continuously, the CPU load ratio may appear lower than the actual value.

[Detected past event] is recorded

→   Following event is recorded when MSCS is used, then the warning is sent to NEC ESMPRO Manager

Source: AlertManagerMainService
Event ID: 802
Description: Cannot get system performance information now (YYYY Code=xxxx).

- System time is modified.
- System was not shut down properly.
- Event log file is broken.

MSCS has a function which enables to see every event on the computer's cluster configuration. In some cases, however, events are not stored by date, when such as shutting down only one side, or launching only one side.

As NEC ESMPRO Agent checks whether the events are stored by date, any events out of the date order is shown as "Past Event Detected."

Note that even when this event is recorded, the event log function continues to function properly for the events stored by date.

Fibre Channel (N8803-035) related log is recorded in the System Event log

→ The below events may be recorded when module switching, including module failure, occurs. This log indicates that the system has detected a non-fatal, correctable event for the server operation. This does not affect the system as long as this event is recorded consecutively.

Source: elxstor
Type: Error
Event ID: 11
Description: Driver detected control error on \Device\Raid\Port?.

Data: Word
0000: 0018000f 0068001 00000000 c00400b
0010: 0000002a 00000000 00000000 00000000
0020: 00000000 00000000 00000000 00000000
0030: 00000000 c004000b 00000000 00000000

Note 1: "?" indicates the board number.
Note 2: When value is 0x0000002a that is indicated in 0x0010 word.

Error logs are recorded while maintenance operation

→ While maintenance operation, such as detaching an I/O module, the following events may be recorded. These logs show that the I/O module was detached. This does not affect the system operation.

Source: PlugPlayManager
Type: Error
Event ID: 12
Description: The device 'XXX' disappeared from the system without first being prepared for removal.

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 do not set the NEC EXPRESSBUILDER DVD during POST and 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 first.
  <Menu to check: [Boot]>

- ☐ If [Os installation] is selected at Boot selection screen, following message is displayed.

After this message appears, check the error and take the appropriate corrective action according to the error codes listed in the table below.

Message	Cause and Remedy
This EXPRESSBUILDER version was not designed for this computer. Insert the correct version and click [OK]. (When you click [OK], the computer reboots)	This EXPRESSBUILDER version was not designed for this server. Execute the NEC EXPRESSBUILDER on the compliant server.
EXPRESSBUILDER could not get the hardware parameters written in this motherboard. This version is not designed for this computer or the motherboard may be broken. (When you click [OK], the computer reboots)	This message is shown when such as NEC EXPRESSBUILDER could not find system-specific information because of motherboard exchanged.
The hardware parameters written in this motherboard are incorrect. This version is not designed for this computer or the motherboard may be broken. (When this error occurs just after changing the motherboard, configure the hardware information properly on the [Maintenance Utility)	

Problems with Windows Autorun Menu

Cannot read online document:

☐   Do you have Adobe Reader installed correctly in your system?

→   Some online documents are supplied with PDF format. To read the document of PDF format, Adobe Reader is required in your system.

☐   Is the operating system Windows XP SP 2?

→   With Windows XP SP2, the following information may appear in browser.

"To help protect your security, Internet Explorer has restricted this file from showing active content that could access your computer. Click here for options..."

1. Click the Information Bar.
   The shortcut menu appears.

2. Click [Allow blocked content].
   The security alert dialog box appears.

3. Click [Yes] on dialog box.

The menu fails to appear:

☐   Is your system Windows XP or later, or Windows 2003 or later?

→   The Windows Autorun Menu is supported by Windows XP/Windows 2003 or later.

→   If your system runs on Windows Autorun Menu on Windows 2000 system, you need to setup IE6.0 before using Windows Autorun Menu.

→   The menu is not available for Windows 2008 server core environment.

☐   Is **Shift** key being pressed?

→   Setting the DVD/CD-ROM with Shift pressed down cancels the Autorun Menu.

☐   Is the system in the proper state?

→   The menu may not appear depending on the system registry setting or the timing to set the DVD/CD-ROM. In such a case, eject the disk from the disk drive once and insert it again.

Some menu items are grayed-out:

☐   Is your computer environment correct?

→   The menu items are grayed-out when the logon user does not have the authority of the Administrator or the system does not meet the requirements to install the application. Login with the user having the proper authority on the proper system, and try again.

Problems with Parameter File Creator

Failed to start Parameter File Creator:

→   Parameter File Creator must be executed with "Microsoft® HTML Application host." If this does not launch, follow the below procedure to associate Parameter File Creator with "Microsoft® HTML Application host."

1. Go to Windows Start menu and select "Run".
2. Type %windir%\system32\mshta.exe /register and click OK.

Problems with NEC ESMPRO

NEC ESMPRO Manager

→ See Chapter 5. See also online document in NEC EXPRESSBUILDER DVD for troubleshooting and other supplementary information.

NEC ESMPRO Agent

Change in monitoring interval of file system and threshold value of free space monitoring do not reflect:

→ Change in monitoring interval by the file system monitoring function of NEC ESMPRO Agent, threshold value of free space monitoring do not reflect immediately. The configuration change becomes effective in the next monitoring interval of monitoring service after changing the setting.

NEC ESMPRO Manager does not receive traps from NEC ESMPRO Agent properly:

→ When the trap community which receives traps in the setting of NEC ESMPRO Manager is changed from the default setting "public", SNMP service setting needs to be changed. See the separate user's guide (Setup), and set the same community name configured in NEC ESMPRO Manager. For NEC ESMPRO Manager to receive traps from NEC ESMPRO Agent properly, both community names must be matched.

Alert is redundantly reported to NEC ESMPRO Manager:

→ When NEC ESMPRO Manager's IP address (or host name) assigned to SNMP service to send traps is assigned in the message manager (TCP/IP), a warning message for redundancy is displayed. Alert is redundantly reported when the same NEC ESMPRO Manager is assigned.

Cannot monitor from NEC ESMPRO Manager:

→ When a community name besides "public" is entered in SNMP service trap properties sheet, see the separate user's guide (Setup) and add the value to "Accepted community names" in security properties sheet. When the choice of "Accepted community names" is set other than "READ CREATE" or "READ WRITE", monitoring from NEC ESMPRO Manager cannot be done.

NEC ESMPRO Agent cannot receive SNMP packet from NEC ESMPRO Manager:

→ When you changed the community name which receive SNMP packet of SNMP service from the default name "public" to the desired name, you must register new community name of NEC ESMPRO Agent from the [Control Panel]. Follow the steps below:

1. Double-click the [NEC ESMPRO Agent] icon in [Control Panel].

2. Select a desired community name from the [SNMP Community] list box
    in [SNMP Setting] of the [General] sheet.

    The community names to receive SNMP packets are listed in the [SNMP
    Community] list box.

3. Click the [OK] to terminate the operation.

    The community name to send SNMP packet from NEC ESMPRO Manager and the
    community name to receive SNMP service in NEC ESMPRO Agent must be the
    same to receive SNMP packet properly.

NEC ESMPRO Agent does not operate properly:

→   When SNMP service is added after applying service pack when OS is installed,
    apply service pack again. Otherwise, SNMP service does not run properly and
    NEC ESMPRO Agent may not run.

→   SNMP service is necessary for NEC ESMPRO Agent to run. If you deleted SNMP
    service after installing NEC ESMPRO Agent, reinstall NEC ESMPRO Agent after
    installing SNMP service.

→   SNMP service may be used among other software. If you install SNMP service
    and NEC ESMPRO Agent while such software is installed, NEC ESMPRO Agent
    service may not be able to start. In such case, delete SNMP service once and install it
    again. Then, reinstall NEC ESMPRO Agent and other software described above.

[Unknown] or illegal information is displayed in CPU information:

→   If you select [CPU Module]–[CPU] in the [ft] tree of the DataViewer, unknown or
    incorrect information appear in some information items.

→   The CPU information can be viewed by selecting [System]–[CPU] in the
    [ESMPRO] tree.

Status of logical PCI slot:

→   There is no effect to PCI module (IO module) since I/O hub and a display
    controller on PCI module (IO module) are logical PCI slot information. Hence, for
    [PCI slot (ID:0/10/102)] and [PCI slot (ID:0/10/103)] under [PCI module
    (ID:0/10)] of FT tree of the date viewer, "Status" becomes "Online" and the status
    color becomes green.

Message prompting to reconfigure a tree in the date viewer is displayed:

→   If you dynamically change the configuration of the CPU or PCI module (IO
    module) in the relevant system during review of the server information by using
    the DataViewer, the message prompting you to reconstruct the tree of the
    DataViewer will appear. If you click the [Yes] button, the tree is reconstructed in
    the DataViewer to reflect the change of the system configuration on the
    DataViewer. If you click [No] button, the tree will not be reconstructed in the
    DataViewer. If such case, the information in the DataViewer may be different
    from the current system information because the change of the system
    configuration is not reflected on the DataViewer.

Module status is shown "Fault":

→ PCI modules (IO modules), SCSI adapters, SCSI buses, and modules under the SCSI enclosure have impact on each other. For example, when the "Status" item of a module changes to "fault," it may be caused by other module error. Check the status of the other modules referring to alert message.

Status color changes to different colors after mounting a hard disk drive:

→ The status of hard disk drive and its upper component, SCSI enclosures change while generation of the mirror is completed after mounting a hard disk drive. In addition, it may take several minutes for OS to recognize the change of disk status and/or disk may need to be scanned again. A status color may turn to abnormal during the process, but it will return to normal color once a mirror is successfully generated.

Line fault and high line load are reported:

→ 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 of time. 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 immediately reported, temporal high line impedance may have occurred. Hence, there is no problem.

Threshold value of LAN monitoring does not reflect:

→ 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.

Remote shutdown function or change of threshold value function from NEC ESMPRO Manager cannot be used:

→ Depending on your OS type or its version, settings for community, SNMP service's security function, are not made, or default settings of authority are different. To enable the remote shutdown and threshold change functions via NEC ESMPRO Manager, make settings of community and set its authority to "READ CREATE" or "READ WRITE."

Machine in a sleep state cannot be monitored:

→ NEC ESMPRO Manager cannot monitor the NEC ESMPRO Agent machine in the sleep state (system standby or system halt state).

→ While NEC ESMPRO Manager monitors server shutdown, the relevant NEC ESMPRO Agent machine may be entered into the sleep state. If so, the report "server access disabled" is issued and the status color of the server icon becomes gray. This cannot indicate whether the NEC ESMPRO Agent machine is shut down or entered into the sleep state. Keep these in mind when operating the system where systems to be monitored may enter the sleep state.

Various logs cannot be referred in ESRAS Utility:

→   ESRAS Utility is not used with this server model.

Managing dual mode system:

→   When managing dual mode system, install Operation/Standby separately to local disk. Installation of NEC ESMPRO Agent is same as normal installation except installing to two servers.

The monitoring event is not alerted:

→   The alert function is based on the event information registered in the event log of the system. Thus, set the event log process on the event viewer to [Overwrite events as needed]. The monitoring event is not alerted in the setting other than that.

→   The event registered in the monitoring event tree on the setting tool of alert function (Alert Manager) is not alerted to the manager if Alert Manager Main Service does not operate. Even when the service is operating, if the enabled/disabled flag of each alerting ways is disabled, the event is not alerted. The alert enabled/disabled flag is set by selecting [Base Setting] – [Report] Properties from [Setting] of Alert Manager. Also the event occurred before Eventlog Service started at the time of system startup cannot be alerted.

→   You can set the time to the shutdown by selecting [Base Setting] – [Other] on the setting tool of the alert function (Alert Manager). The initial value is 20 seconds. When you set smaller value than this, the alert may not be performed at the time of shutdown.

→   When an alert failure occurs at the time of alerting of monitoring target event, an error message is logged in the event log. If you newly log the error message which occurs at the time of alerting as a monitoring target event, the error at the time of alerting will be alerted again. As the result, large number of alerts will be sent when recovering the failure. This leads to the increase of system load and the degradation of the performance. Do not register the events especially which are produced by the following alert function services as the monitoring target.

Alert Manager ALIVE(S) Service
Alert Manager Main Service
Alert Manager Socket(S) Service

Printer Information's Available Time:

When you add a new printer, install its driver and make its settings, if you do not make settings for the available time from the properties window of the printer, the printer's available time (From and To) in [Printers and Faxes] are [00:00], on the other hand, NEC ESMPRO Manager's time are [9:00]. To display them properly, make the settings of printer from its properties window. The procedures are as follows:

1. From [Control Panel], click [Printers and Faxes], and open the properties window of a printer for making settings.

2. Select the [Advanced] tab.

3. Enter values in the available time ("Available from" and "To"), and click [OK] on the properties window to exit.

Now, you can see the correct information from NEC ESMPRO Manager, too.

The disk related works are desired while NEC ESMPRO Agent is running:

→ The following works to disks (hard disk drive or magneto optical) are not allowed while NEC ESMPRO Agent is running.

■ To format or delete a partition by Disk Administrator or by other means.

■ To request programmatically to remove media from removable disks such as MO, Zip and PD.

Please conduct these works by following the procedure written below.

1. Open [Control panel] – [Service].

2. Select a service named "ESM Common Service" and click [Stop].

3. Confirm that "ESM Common Service" is stopped, and close the [Service] in [Control Panel].

4. Do the disk–related works.

5. Open the [Service] in [Control Panel] again. Select "ESM Common Service" and click the [Start].

6. Confirm that "ESM Common Service" is started and close the [Service] and [Control Panel].

Changing the threshold of temperature/voltage/fan monitoring is desired:

→ Displaying/changing the threshold of the temperature/voltage /fan from NEC ESMPRO Agent is not allowed. However, you can display the threshold on the DataViewer of NEC ESMPRO Manager on some models. NEC ESMPRO Agent monitors using the appropriate threshold that is set for each model.

The detail information of alert is displayed as "Unknown":

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

Monitoring the failures of the tape device is desired:

→ NEC ESMPRO Agent does not monitor the failures of the tape device. If you want to conduct monitoring, use backup software or tape monitoring application. Using the event monitoring function of NEC ESMPRO Agent allows you to monitor the event log of backup software or applications.

File system monitoring cannot be inherited 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.

Temperature/voltage/fan sensors appear in an incorrect manner:

→ Some modes are equipped with temperature/voltage/fan sensors that do not have information on status, current values, rpm, threshold etc. Therefore, if you view such a sensor on NEC ESMPRO Manager, it may be displayed as follows:

■ The status becomes "Unknown" (grayed out) on the DataViewer.

■ The current value or rpm is displayed as "Unknown" on the DataViewer.

■ The status is grayed out on the Web component DataViewer.

■ The current value or rpm becomes blank on the Web component DataViewer.

Even if the sensor is stated like stated above, it is monitoring the server.

Temperature/voltage error occurs on the CPU/PCI modules:

→ At the time when a temperature or voltage error occurs on CPU/PCI module (CPU/IO module), necessary actions will differ depending on their status as shown below. You can check the status of each module from the DataViewer of NEC ESMPRO Manager or ftServer Utility.

Status	Operation
Duplex	Stop the failed CPU/PCI module (CPU/IO module).
Simplex	Shut down the system.

■ If the status is "Empty", the module is not mounted. Sensor monitoring is not conducted.

■ If disks are mounted on PCI modules (IO modules), the status of both modules is "Simplex" while the disks are mirrored. Temperature or voltage error occurring during disk mirroring will result in the system to shut down.

Network drive is not displayed in the DataViewer:

$\rightarrow$ On WindowsXP or the OS released after it, the drive connected to network is not displayed under the file system tree in the DataViewer of NEC ESMPRO Manager.

Shutdown monitoring:

$\rightarrow$ 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.

The external clock of CPU is listed as "Unknown":

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

[ft] tree appears on DataViewer in an incorrect manner:

$\rightarrow$ After the system starts up, the tree or the state of a DataViewer may not be displayed correctly due to high load of the system. In about 20 minutes after the system startup, when a pop-up message which prompts you to reconstruct a DataViewer appears, click [OK]. The DataViewer will be reconstructed and the tree and the status will be displayed correctly.

The information on the floppy disk appears in an incorrect manner:

$\rightarrow$ After switching on and off the power of the CPU/IO module, the floppy disk drive name of [I/O Device] on DataViewer may be different from the name that is recognized by the OS.

(Example: drive name on DataViewer: "A"

drive name recognized by the OS "B")

Check the floppy disk drive name on Explorer.

$\rightarrow$ If you add or delete floppy disk drive connected with USB while the system is running, the drive information under the [I/O Device] in the DataViewer will be updated at the next system startup.

The status of Ethernet board is displayed as an error:

→   If an Ethernet adapter is not used (not connected to cable), set it to "Disable" in [Network Connections] from Control Panel. If an Ethernet adapter are about to disable has dual LAN settings (AFT function), remove the dual LAN settings before disable it.

NEC ESMPRO Agent does not work properly in the environment where Oracle products and NEC ESMPRO Agent coexist:

→   The installation of the Oracle products may change Startup type of SNMP Service into "Manual." If so, change the setting back to "Automatic" and set up correctly according to the description of the Oracle product.

SCSI Status on a DataViewer:

→   "Unknown" is always displayed for the following items:

-   "Bus Mode" and "Backplane Config" in "General" of "SCSI Enclosure"

-   "Type," "Threshold," "Current," "Faults," "Time of last fault," "Time of last run," and "Result" in "Maintenance" of "SCSI Enclosure"

-   "Type," "Reassign Block Count," "Reassign Block threshold," and "Path Information" in "General" of "SCSI Slot"

-   "Type," "Threshold," "Current," "Faults," and "Time of last fault" in "Maintenance" of "SCSI Slot"

SCSI Status while IO Module is Starting or being Stopped:

→ While a PCI module is starting or being stopped, the status of SCSI adapters, SCSI bus, SCSI enclosure, SCSI slots, and mirror disks temporarily indicates an undefined status. Once the module is started or stopped, the status will return to normal.

Status of SCSI Slots and Mirrored Disks at High Load:

→ When the system load is high, the status of SCSI slots and mirror disks may not be obtained, and incorrect status may be displayed temporarily.

"Warning" is displayed for a "Normal" mirror volume on Disk Management:

→ If the combination of the disks that configure a mirror is different from the one described in "Disk Operations" in Chapter 3, "Warning" is displayed for a normal mirror volume.

DataViewer is not displayed normally when the PCI module (IO module) is running in the simplex mode.

→ When only the PCI modules (IO modules) is running in the simplex mode (non-duplexed mode), the DataViewer cannot display the status of the SCSI enclosure and mirror disk. To check if the duplex mode is changed to the simplex mode, check the event log or alert viewer log, or the status color of the PCI module by the DataViewer.

COLLECTING TROUBLE LOGS

In the event of trouble, you can get information in the procedures described below:

IMPORTANT:

- You can perform the procedures described below only when you are asked by your maintenance personnel to get trouble logs.

- When the system restarts after the trouble, it may show a message that there is a shortage of virtual memory. However, continue the system startup. If you reset and restart the system, you cannot get correct information.

Collection of Server Types

Collect the information of various failures on this server using NEC Product Info Collection Utility. Refer to "NEC Product Info Collection Utility" (page 5-88) for how to use.

Collection of Event Logs

Collect the logs of various events that have occurred in the NEC Express5800/ft series. It is recommended that you collect all the logs of [Application Log], [Security Log] and [System log] by the following procedure.

IMPORTANT: If a STOP error or system error has occurred or the system has stalled, restart the system, and then start collecting event logs.

1. Click [Start] - [Settings] - [Control Panel] - [Administrative Tools] - [Event Viewer].

2. Select the type of the log to be collected.

   [Application Log] contains events related to the applications that were active at occurrence of the events. [Security Log] contains security-related events. [System Log] contains events that occurred in system components of Windows Server 2003, Enterprise Edition.

3. Click [Save Log File As...] in the [Action] menu.

4. Enter the name of the target archive log file in the [File name] box.

5. Select the format of the target log file from the [Save as type] list box, and click [OK].

Collection of Configuration Information

Collect information such as the hardware configuration and internal setting information of the NEC Express5800/ft series.

> **IMPORTANT:** If a STOP error or system error occurs or the system stalls, restart the system, and then start the work.

1. Click [Start] - [All Programs] - [Accessories] - [System Tools] - [System Information].

2. Select the [Save…] from the File menu.

3. Enter the name of the target file in the [File name] box.

4. Click [Save].

Collection of Diagnostic Information by Dr. Watson

Collect diagnostic information related to application errors by using Dr. Watson.

You can designate any destination to save diagnostic information.

For details, see help information. Click [Start] - [Run...], execute "drwtsn32.exe," and click [Help] in the [Dr. Watson for Windows] dialog box.

COLLECTING THE MEMORY DUMP

If a failure occurs, the memory data should be dumped to acquire the required information. If you stored the dump data in a DAT, label it so as to indicate the software (e.g. NTBackup) you used for storing it. You may save the diagnosis data to a desired destination.

> **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 four to eight seconds. Use something sharp, such as curved clips to press the DUMP switch on CPU/IO module 1.

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 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 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 working ft server utility's, refer to the separate User's Guide (setup) "Confirming the ft Server Control Software Version" (page 5-13).

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 ftServer Utility of the NEC ESMPRO Agent or the NEC ESMPRO Manager from the management PC on the network. After a new module is installed to the server, enable the module using the ftServer Utility or the NEC ESMPRO Manager.

    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 (except SCSI board).

- 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 ftServer Utility or the NEC ESMPRO Manager.

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 "Step 8: Set Dual Disk Configuration" in Chapter 4 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 Failed Hard Disk Drives" on page 3-21 and "Removing 2.5-inch Hard Disk Drive" on page 8-9.

    Shutdown of Windows Server 2003 is unnecessary.

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).

System Upgrade   8-11

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 management software (e.g., ftServer Utility or NEC ESMPRO Manager) 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 this end, use the ftServer Utility of the NEC ESMPRO Agent installed to your server or the DataViewer of the NEC ESMPRO Manager.

For the detailed procedure, see "NEC ESMPRO Agent and Manager" – "Maintenance of NEC Express5800/ft series" in Chapter 5.

NEC ESMPRO Manager
Select [ft] - [CPU Module] - [CPU Module (to be removed)] - [Maintenance] - [Bring Up/Bring Down] - [Bring Down].

ftServer Utility
Select [FTServer] - [CPU Module] - [CPU Module (to be removed)] - [Bring Up/Bring Down] - [Down].

Repeat the operation mentioned above for the IO module (PCI module) and confirm that the status of the CPU/IO module and the IO module (PCI module) are "Removed."

TIPS:

When removing CPU/IO modules 0, select [Bring Down] for CPU module (ID:0) and PCI module (ID:10)

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 the cable.

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 ftServer Utility or NEC ESMPRO Manager DataViewer, 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 to96GB or 48 GB memory can be additionally installed.
  ・W2K8 OS : 8GB x 12
  ・W2K3 OS : 8GB x 6, 4GB x 12

- 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 #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

*72GB and 96GB DIMM configuration is applied only to W2K8 OS with additional CPU installed.

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.

Dummy memory module

> **IMPORTANT:**
>
> Keep and store the removed dummy memory module with care.

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.

15. After starting the OS, set the paging file size to at least the recommended value (1.5 times the installed memory size). (See "Size of the Partition to be Created" in Chapter 4 of the User's Guide (Setup).)

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 NEC ESMPRO Manager or ftServer Utility.

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.

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 cable connected to the air duct cover.

5. Verify the location of the CPU socket.

6. Remove four screws that secure the dummy heat sink.
    Remove the dummy heat sink.

Dummy heat sink

> **IMPORTANT:**
>
> Keep and store the removed dummy heat sink and
> four screws with care.

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

Heat sink of the additional CPU

Front of the Server

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	
		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
N8804-036	SCSI board		✓	✓	✓	✓	*2
N8803-037	SAS board		✓	✓	✓	✓	*2
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.
*2 Use N8803-036/037 by exclusion. These board can install to one piece by a total per the CPU/IO module and two pieces in a device.

■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	
		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
N8804-036	SCSI board		✓	✓	N/A	N/A	*2
N8803-037	SAS board		✓	✓	N/A	N/A	*2
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.
*2 Use N8803-036/037 by exclusion. These board can install to one piece by a total per the CPU/IO module and two pieces in a device.

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.

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 event 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 event 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 4-24 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 8-31.

- Driver installation procedure

TIPS:

To perform this procedure, you have to log on the system as an Administrator or a member of the Administrators group.

For NEC Express5800/ft series, use two option PCI boards in a pair to make dual configuration.

After installing OS, install drivers in the following procedure and make dual configuration of the PCI boards.

Follow the steps below to install the driver and establish a dual configuration:

1. Mount the PCI boards to the slots with the same number in CPU/IO modules 0 and 1, and then start the system.

2. When the system launches, [New Hardware Detected] window appear and the driver will be installed automatically.

3. Configure transmitting speed and Duplex mode for the driver.

TIPS:

If the check box in [Internet Protocol (TCP/IP)] is unchecked, first check an then configure the IP address.

(1) Launch Device Manager

(2) Expand network adapter and double click Added NIC.
      The name of NIC is as follow:

      Stratus 82576 2-Port Copper Gigabit Adapter

(3) Select the [Link speed] tab, and configure value of [Speed and Duplex] to match
      the hub.

(4) On network adapter property, click [OK] at dialog box.

(5) By the same procedure, configure another added NIC.

Add/delete protocol or services if needed. On [Network Connections], go to Local Area
connection property's dialog box.

TIPS:

[Network monitor] is recommended to add as one of the services.
[Network monitor] can monitor frames (or packets) sent and received a
computer that installs [Network monitor]. This is a useful tool to
analyze network failure. Refer to [Setup for failure managing] for the
installation procedure.

As to the setup of another network port, [Managing port], refer to the
online document [EDPRESSSCOPE Engine 2 User's guide] stored in
the NEC EXPRESSBUILDER DVD.

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4.   Set a dual LAN configuration.

Refer to "DUPLEX LAN CONFIGURATION" on page 3-25.

Now the 1000BASE-T 2ch board set is installed.

N8803-036 SCSI Board

■ The lists of slots to install optional PCI boards

Refer to the table "List of option PCI boards and installable slots" on page 8-31.

■ Driver installation procedure

TIPS:

To perform this procedure, you have to log on the system as an Administrator or a member of the Administrators group.

For Windows Server 2008

1. Mount N8803-036 SCSI board and start the system. When this launches, [New Hardware Detected] window appear and the driver will be installed automatically. However, the standard driver for the OS is not applicable on the ft server. Therefore, update the driver with the following procedure.

2. Insert the "NEC EXPRESSBUILDER" DVD into the DVD-ROM drive and run the following command after starting the Command Prompt: Run the command below.

For Windows Server 2008
Optical disc drive: ¥002¥win¥has¥w2k8amd64¥HASSETUP¥SCSI¥UPDATE.VBS

For Windows Server 2003

Optical disc drive: ¥002¥win¥has¥w2k3¥HASSETUP¥SCSI¥UPDATE.VBS

3.   Confirm the version of the driver.
     For Windows Server 2008
     From [Device Manager], select [Storage controllers]. Right-click [Adaptec SCSI Card
     29320LPE-Ultra320 SCSI] and display the property. Click [Driver] tag and confirm
     whether the driver version is 7.0.0.8. (see below).

For Windows Server 2003
From [Device Manager], select [SCSI and RAID Controller]. Right-click [Adaptec SCSI Card 29320LPE-Ultra320 SCSI] and display the property. Click [Driver] tag and confirm whether the driver version is 7.0.0.7. (see below).

N8803-037 SAS Board

Slots for Installation

Refer to "List of option PCI boards and installable slots" on page 8-32.

Installation Procedure

1. Mount N8803-037 SAS board and start the system. When this launches, [New Hardware Detected] window appear and the driver will be installed automatically.

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

TIPS: To perform this procedure, you have to log on the system as an Administrator or a member of the Administrators group.

For Windows Server 2008

1. Mount a N8803-035 Fibre Channel board set, and then start the system.

2. Start Device Manager from [Start] - [Program] - [Administrative Tool] - [Computer Management], and check if "Fibre Channel Controller" The board name of the Fibre Channel board is "Emulex LPX000 In case of Fibre Channel Storport Driver," advance towards 3. because it is necessary to update a driver.

In the board name of the Fibre Channel board, in case of "Emulex LightPulse LPe1150-F4-N, Storport Miniport Driver," a right driver is installed.

Note: After LPe1150 of the board name, it sometimes changes with the case.

3. Load NEC EXPRESSBUILDER DVD on the optical disc drive, then open command prompt and run following commands:

%ProgramFiles%¥ftsys¥install¥Emulex_STORPORT_INSTALL.cmd

If a command prompt is closed, the installation is completed. Restart the system.

4. After the system is rebooted, start Device Manager from [Start] - [Program] - [Administrative Tool] - [Computer Management], and check that "Emulex LightPulse LP1150-F4, PCI Slot n, Storport Miniport Driver" are displayed under the [Storage Controllers] as many as installed.

Note: After LPe1150 of the board name, it sometimes changes with the case.

For Windows Server 2003

1. Mount a N8803-035 Fibre Channel board set, and then start the system.

2. Start Device Manager from [Start] - [Program] - [Administrative Tool] - [Computer Management], and check if "Fibre Channel Controller" appears under the [Other devices] as many as mounted.

3. Load NEC EXPRESSBUILDER DVD on the optical disc drive, then open command prompt and run following commands:

%ProgramFiles%¥ftsys¥install¥Emulex_STORPORT_INSTALL.cmd

If a command prompt is closed, the installation is completed. Restart the system.

4. After the system is rebooted, start Device Manager from [Start] - [Program] - [Administrative Tool] - [Computer Management], and check that "Emulex LightPulse LP1150-F4, PCI Slot n, Storport Miniport Driver" are displayed under the [SCSI and RAID Controllers] as many as installed.

IMPORTANT:

- StoragePathSavior is necessary to connect NEC Storage using N8803-035 Fiber Channel boards.

- Mount N8803-035 Fibre Channel boards after completing the OS installation. They are used in a pair. Mount each controller on the slot of the same position of each PCI module.

Appendix A

Specifications

Item		NEC Express5800/R320a-E4 N8800-143F	NEC Express5800/R320a-M4 N8800-144F
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	
	Maximum	W2K8 OS :96GB W2K3 OS :48GB	
	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)	
	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)	
Bundled standard software		RDR	

Caution The sleep and hibernation function uncorresponds.

N8800-143F, EXP320L

NEC Express5800/R320a-E4

N8800-144F, EXP320M

NEC Express5800/R320a-M4
User's Guide