NEC

2.5-inch Disk Model: N8100- 1654F/1655F/1656F/1657F/1658F/1659F/
1717F/1718F/1719F/1720F/1721F/1722F/
1723F
3.5-inch Disk Model: N8100- 1660F/1661F/1662F/1663F/
1724F/1725F/1726F

NEC Express5800/R120b-1
User's Guide

PROPRIETARY NOTICE AND LIABILITY DISCLAIMER

Keep this manual at hand for quick reference at anytime necessary.

SAFETY INDICATIONS

Follow the instructions in this manual for your safety to use the NEC Express server.
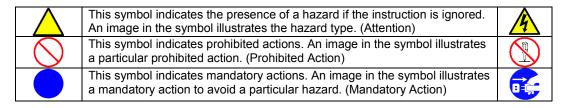
Your server contains components with possible danger, hazards that may cause by ignoring warnings, and preventive actions against such hazards.

Server components with possible danger are indicated with a warning label placed on or around them as well as described in this manual.

In this manual or warning labels, "WARNING" or "CAUTION" is used to indicate a degree of danger. These terms are defined as follows:

⚠ WARNING	Indicates the presence of a hazard that may result in death or serious personal injury if the instruction is ignored.
⚠ CAUTION	Indicates the presence of a hazard that may cause minor personal injury, including burns, or property damage if the instruction is ignored.

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

⚠	This symbol indicates the presence of a hazard if the instruction is ignored. An image in the symbol illustrates the hazard type. (Attention)	⚡
🚫	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action. (Prohibited Action)	🚫
⬤	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard. (Mandatory Action)	🔌

(Example)

Symbol to draw attention

Term indicating a degree of danger

⚠ CAUTION
Plug in to a proper power source. Use a proper wall outlet of the specified voltage. Use of an improper power source may cause a fire or a power leak.

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

Description of a danger

SYMBOLS USED IN THIS MANUAL AND WARNING LABELS

Attentions

⚠	Indicates that improper use may cause an electric shock.
⚠	Indicates that improper use may cause fingers to be caught.
⚠	Indicates that improper use may cause personal injury.
⚠	Indicates that improper use may cause personal injury.
⚠	Indicates that improper use may cause fumes or fire.
⚠	Indicates that improper use may cause loss of eyesight due to laser beam.
⚠	Indicates that improper use may cause explosion.
⚠	Indicates a general notice or warning that cannot be specifically identified.

Prohibited Actions

🚫	Do not disassemble, repair, or modify the server. Otherwise, an electric shock or fire may be caused.
🚫	Do not place the server near the fire. Otherwise, a fire may be caused.
🚫	Do not touch the component specified by this symbol. Otherwise, an electric shock or burn may be caused.
🚫	Do not use the server in the place where water or liquid may pour. Otherwise, an electric shock or fire may be caused.
🚫	Do not touch the server with wet hand. Otherwise, an electric shock may be caused.
🚫	Indicates a general prohibited action that cannot be specifically identified.

Mandatory Action

🔌	Unplug the power cord of the server. Otherwise, an electric shock or fire may be caused.
⏚	Be sure to provide earthing. Otherwise, an electric shock or fire may be caused.
❗	Indicates a mandatory action that cannot be specifically identified. Make sure to follow the instruction.

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.

CE Statement

Warning: This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate preventive measures (EN55022).

BSMI Statement

警告使用者：

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

Notes:
(1) No part of this manual may be reproduced in any form without the prior written permission of NEC Corporation.
(2) The contents of this User's Guide may be revised without prior notice.
(3) The contents of this User's Guide shall not be copied or altered without the prior written permission of NEC Corporation.
(4) All efforts have been made to ensure the accuracy of all information in this User's Guide. If you notice any part unclear, incorrect, or omitted in this User's Guide, contact the sales agent where you purchased this product.
(5) NEC assumes no liability arising from the use of this product, nor any liability for incidental or consequential damages arising from the use of this User's Guide regardless of Item (4).
(6) If you find any missing pages or pages out of order in this manual, please contact your dealer for a replacement.
(7) The ITE is not intended to be installed and used in a home, school or public area accessible to the general population, and the thumbscrews should be tightened with a tool after both initial installation and subsequent access to the panel.
(8) This equipment intended for installation in restricted access location.
- access can only be gained by SERVICE PERSONS or by USERS who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken; and
- access is through the use of a TOOL or lock and key, or other means of security, and is controlled by the authority responsible for the location.

Warning: Remove all power supply cords before service.

Trademarks

Momentary voltage drop prevention:

This product may be affected by a momentary voltage drop caused by lightning. To prevent a momentary voltage drop, an AC uninterruptible power supply (UPS) unit should be used.

PREFACE

Congratulations on your purchase of NEC Express server.

Purchase of this server is your assurance of receiving state-of-the-art, high quality hardware to meet your needs, both now and in the future.

Read this User's Guide thoroughly to fully understand handling of the NEC Express server and appreciate its functions to the maximum extent.

ABOUT THIS USER'S GUIDE

This manual is a guide for proper setup and use of your server.
This manual also covers useful procedures for dealing with difficulties and problems that may arise during setup or operation of your server.
Keep this manual for future use.
The following describes how to proceed with this manual.

How to Use This Manual

To aid you in finding information quickly, this manual contains the following information:

Chapter 1   Notes on Using Your Server
includes information that needs attention to use the server. Make sure to read this chapter before setting up and using the server. It also includes requirements and advisory information for transfer and disposal of the server.

Chapter 2   General Description
includes information necessary to use the server, such as names and functions of its components, handling of the optical disk drive.

Chapter 3   Setting Up Your Server
tells you how to select a site, unpack the system, make cable connections, and power on your system.

Chapter 4   Configuring Your Server
tells you how to configure the system and provides instructions for running the BIOS SETUP Utility and the RAID configuration utility, which is used to configure RAID drives in your system.
This chapter also provides information on mother board jumper settings.

Chapter 5   Installing the Operating System with Express Setup
describes how to install the operating system.

Chapter 6   Installing and Using Utilities
describes how to install the utilities for the server. It also includes a description on using the attached "NEC EXPRESSBUILDER" DVD-ROM.

Chapter 7   Maintenance
provides you with all the information necessary to maintain successful operation of the server. This chapter also includes a description on relocating and storing the server.

Chapter 8   Troubleshooting
contains helpful information for solving problems that might occur with your system.

Chapter 9   Upgrading Your Server
provides you with instructions for upgrading your system with an additional processor, optional memory, optional add-in cards, hard disk drives, peripheral devices, and power supply.

Chapter 10   Internal Cabling Diagram
includes cabling information for the SAS/SATA2 controller, 5.25-inch device, and the power supply.

Appendix A   Specifications
provides specifications for your server.

Appendix B   Other Precautions
provides supplementary notes on using the server.

Appendix C   IRQ
provides a list of factory-set IRQs and I/O port addresses assigned.

Appendix D   Installing Windows Server 2008 R2
describes how to install Microsoft Windows Server 2008 R2 without using Express Setup. Using the Express Setup tool is recommended for installing Windows Server 2008 R2. See Chapter 5 for details.

Appendix E   Installing Windows Server 2008
describes how to install Microsoft Windows Server 2008 without using Express Setup. Using the Express Setup tool is recommended for installing Windows Server 2003 x64 Editions. See Chapter 5 for details.

Appendix F   Installing Windows Server 2003 x64 Editions
describes how to install Microsoft Windows Server 2003 x64 Editions without using Express Setup. Using the Express Setup tool is recommended for installing Windows Server 2003 x64 Editions. See Chapter 5 for details.

Appendix G   Installing Windows Server 2003
describes how to install Microsoft Windows Server 2003 without using Express Setup. Using the Express Setup tool is recommended for installing Windows Server 2003. See Chapter 5 for details.

Appendix H   Using a Client Computer Which Has a CD Drive
describes how to install the management software of EXPRESSBUILDER to the client computer without the DVD drive.

Appendix I   Accessing Power and Performance Data
describes how to collect the power and performance data, including power consumption, inlet air temperature, and processor utilization of NEC Express server.

Appendix J   Product Configuration Record Table
provides a table to be filled with your server configuration.

Text Conventions

The following conventions are used throughout this manual. For safety symbols, see "SAFETY INDICATIONS" provided earlier.

IMPORTANT: Items that are mandatory or require attention when using the server

NOTE: Helpful and convenient piece of information

IN THE PACKAGE

The carton contains various accessories, as well as the server itself. See the packing list to make sure that you have everything and that individual components are not damaged. If you find any component missing or damaged, contact your service representative.

- Store the provided accessories in a designated place for your convenience. You will need them to install an optional device or troubleshoot your server, as well as to set it up.

- Make a backup copy of each provided floppy disk, if any. Store the original disk as the master disk in a designated place, and use its copy.

- Improper use of any provided DVD/CD-ROM may alter your system environment. If you find anything unclear, immediately ask your service representative for help.

CONTENTS

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Chapter 1

Notes on Using Your Server
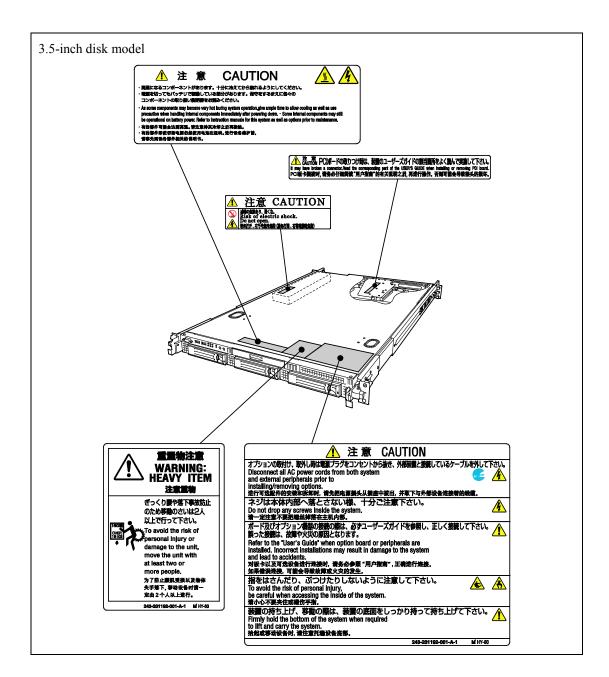
This chapter includes information necessary for proper and safe operation of your server.

WARNING LABELS

The warning label is attached to components with possible danger or their vicinity in your server to inform the user that a hazardous situation may arise when operating the server. (Do not intentionally remove or damage any of the labels.)

If you find any labels totally/partially removed or illegible due to damage, contact your sales representative.

2.5-inch disk model

3.5-inch disk model

SAFETY NOTES

This section provides notes on using the server safely. Read this section carefully to ensure proper and safe use of the server. For symbols, see "SAFETY INDICATIONS" provided earlier.

For part names described in the safety instruction chapter in this guide, see Chapter 2.

General

	⚠ WARNING
🚫	Do not use the server for services where critical high availability may directly affect human lives.
	Your server is not intended to be used with or control facilities or devices concerning human lives, including medical devices, nuclear facilities and devices, aeronautics and space devices, transportation facilities and devices; and facilities and devices requiring high reliability. NEC assumes no liability for any accident resulting in personal injury, death, or property damage if the server has been used in the above conditions.
⚠🔌	Do not use the server if any smoke, odor, or noise is present.
	If smoke, odor, or noise is present, immediately turn off the server and disconnect the power plug from the outlet, then contact your service representative. Using the server in such conditions may cause a fire.
⚡	Keep needles or metal objects away from the server.
	Do not insert needles or metal objects into ventilation holes in the server or openings in the optical disk drive. Doing so may cause an electric shock.
🚫	Do not use the server in any unapproved place.
	Install the server on a standard EIA 19-inch rack assembly. Do not install the rack containing the server in a place inappropriate to the rack installation environment. Failure to follow these instructions may cause some bad influences to be imposed on the server and other systems installed on the rack and also a fire or personal injury due to falling of the rack may occur. For the detailed explanation on the place where the server should be installed and the earthquake-resistant construction for the rack, refer to the manual attached to the rack or contact you service representative.
⚠🚫	Always install the server on a rack conforming to the relevant standard.
	Install the server on a rack confirming to the EIA standard for the Server to be used. Do not use the server with installed on any other rack than standard EIA 19-inch rack or without the installation on a proper rack. Failure to follow these instructions may cause the server to operate incorrectly and/or personal injury or damages of surrounding devices to occur. Contact your service representative for the racks available for the server.

⚠ CAUTION

Keep water or foreign matter away from the server.

Do not let any form of liquid (water etc.) or foreign matter (e.g., pins or paper clips) enter the server. Failure to follow this warning may cause an electric shock, a fire, or a failure of the server. When such things accidentally enter the server, immediately turn off the power and disconnect the power plug from the outlet. Do not disassemble the server. Contact your service representative.

Rack

⚠ CAUTION

Do not carry or install the server only by a single person.

More than one person is required to carry or install the rack. Failure to follow this instruction may cause the rack to fall to result in personal injury and/or breakages of surrounding devices. In particular, a high rack (such as 44U rack) is unstable if it is not fixed by stabilizers. More than one person must always carry or install the rack while they support it.

Do not install the server so that the load may be concentrated on a specific point.

Install stabilizers on the rack so that the total load of the rack and devices mounted on the rack is not concentrated on a singe point or join more than one rack with each other to distribute the load. Failure to follow this instruction may cause the rack to fall to result in personal injury.

Do not install components on the server only by a single person.

More than one person is required to install parts including the doors and trays for the rack. Failure to follow this instruction may cause some parts to fall to be broken and/or to result in personal injury.

Insert hinges completely.

When installing the rack door, make sure that hinge pins at top and bottom of the door are completely inserted into the rack. Failure to follow this instruction may cause the door to fall to be broken and/or to result in personal injury.

Anchor the equipment rack.

The equipment rack must be anchored to an unmovable support to prevent it from falling over when one or more servers are extended in front of it on slide assemblies. The anchors must be able to withstand a force of up to 113 kg (250 lbs.) You must also consider the weight of any other device installed in the rack.

Do not leave more than one device being pulled out from the rack.

Pulling out more than one device from the rack may cause the rack to be fallen. Only pull out a single device from the rack at a time.

Do not provide the wiring for the server to exceed the rating of the power supply.

To prevent burns, fires, and device damages, the power supplied to the power supply in the rack shall not exceed the rating load of the power branch circuit. Contact your electric constructor or the local power company for the requirements on the wiring and installation of electric facilities.

Power Supply and Power Cord Use

⚠ WARNING

Do not hold the power plug with a wet hand.

Do not disconnect/connect the plug while your hands are wet. Failure to follow this warning may cause an electric shock.

Do not connect the ground wire to a gas pipe.

Never connect the ground wire to a gas pipe. Failure to follow this warning may cause a gas explosion.

⚠ CAUTION

Plug in to a proper power source.

Use a proper wall outlet. Use of an improper power source may cause a fire or a power leak.
Do not install the server where you need an extension cord. Use of a cord that does not meet the power specifications of the server may heat up the cord and cause a fire.

Do not connect the power cord to an outlet that has an illegal number of connections.

The electric current exceeding the rated flow overheats the outlet, which may cause a fire.

Insert the power plug into the outlet as far as it goes.

Heat generation resulting from a halfway inserted power plug (imperfect contact) may cause a fire. Heat will also be generated if condensation is formed on dusty blades of the halfway inserted plug, increasing the possibility of fire.

Use the authorized power cord only.

Use only the power cord that comes with your server. Use of an unauthorized power cord may cause a fire when the electric current exceeds the rated flow.
Also, observe the following to prevent an electric shock or fire caused by a damaged cord.

- Do not stretch the cord harness.
- Do not pinch the power cord.
- Do not bend the power cord.
- Keep chemicals away from the power cord.
- Do not twist the power cord.
- Do not place any object on the power cord.
- Do not bundle power cords.
- Do not alter, modify, or repair the power cord.
- Do not secure the power cord with staples or equivalents.
- Do not use any damaged power cord. (Replace a damaged power cord with a new one of the same specifications. Ask your service representative for replacement.)

⚠ CAUTION

Do not use the attached power cord for any other devices or usage.

The power cord that comes with your server is designed aiming to connect with this server and to use with the server, and its safety has been tested. Do not use the attached power cord for any other purpose. Doing so may cause a fire or an electric shock.

Installation, Relocation, Storage, and Connection

⚠ WARNING

Disconnect the power cord(s) before installing or removing the server.

Make sure to power off the server and disconnect the power cord(s) from a power outlet before installing/removing the server. All voltage is removed only when the power cords are unplugged.

⚠ CAUTION

Never attempt to lift the server only by yourself.

The server weighs max. 21 kg (depending on its hardware configuration). Carrying the server only by yourself may strain your back. Hold the server firmly by its bottom with another person to carry it. Do not hold the front door to lift the server. The front door may be disengaged from the server, causing personal injury.

Do not install the server in any place other than specified.

Do not install the server in the following places or any place other than specified in this User's Guide. Failure to follow this instruction may cause a fire.
- a dusty place
- a humid place such as near a boiler
- a place exposed to direct sunlight
- an unstable place

Do not install the server in a place subject to corrosive gases.

Do not install the server in a place subject to corrosive gases (such as sodium chloride, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, or ozone) or a place where the air might contain elements that lead to corrosion (such as sulfur) or electrically conductive metals as this might cause the wiring on the printed wiring board to short-circuit, leading to fire.

Do not install the server on a rack with leaving covers removed.

Do not install the server on a rack with the cover being removed. Failure to follow this instruction may reduce the cooling effect in the server to result in some malfunction and/or dusts to enter the server to result in a fire or electric shock.

Do not pinch your finger with rails or other components.

Note sufficiently that your fingers may not be caught between a rail and another mechanical part or cut by a rail at installation or removal of the server from the rack.

Do not apply any load on the server pulled out from the rack.

Do not apply any load on the server pulled out from the rack. Doing so bends the frame of the server. Consequently, the server cannot be pushed back into the rack. Placing an object on the server may also cause personal injury if the server drops.

⚠ CAUTION

Do not connect any interface cable with the power cord of the server plugged to a power source.

Make sure to power off the server and unplug the power cord from a power outlet before installing/removing any optional internal device or connecting/disconnecting any interface cable to/from the server. If the server is off-powered but its power cord is plugged to a power source, touching an internal device, cable, or connector may cause an electric shock or a fire resulted from a short circuit.

Do not use any unauthorized interface cable.

Use only interface cables provided by NEC and locate a proper device and connector before connecting a cable. Using an authorized cable or connecting a cable to an improper destination may cause a short circuit, resulting in a fire.
Also, observe the following notes on using and connecting an interface cable.
- 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 server with loose cable connections.

Cleaning and Working with Internal Devices

⚠ WARNING

Do not disassemble, repair, or alter the server.

Never attempt to disassemble, repair, or alter the server on any occasion other than described in this User's Guide. Failure to follow this instruction may cause an electric shock or fire as well as malfunctions of the server.

Do not remove the lithium battery.

The server contains the lithium battery. Do not remove the battery. Placing the lithium close to a fire or in the water may cause an explosion.

When the server does not operate appropriately due to the dead lithium battery, contact your service representative. Do not disassemble the server to replace or recharge the battery by yourself.

Disconnect the power plug before cleaning the server.

Make sure to power off the server and disconnect the power plug from a power outlet before cleaning or installing/removing internal optional devices. Touching any internal device of the server with its power cord connected to a power source may cause an electric shock even of 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

Avoid installation in extreme temperature conditions.

Immediately after the server is powered off, its internal components such as hard disk drives are very hot. Leave the server until its internal components fully cool down before installing/removing any component.

Make sure to complete board installation.

Always install a board firmly. An incompletely installed board may cause a contact failure, resulting in smoking or fire.

Do not touch any electrical components inside the server during the hot-swap replacement.

All power flows inside the server while the hot-swap replaceable components (hard disk and power supply). Do not touch the electrical components inside the server to avoid an electric shock.

During Operation

⚠ CAUTION
Do not pull out or remove the server from the rack unnecessarily. Do not pull out or remove the server from the rack unnecessarily. Pulling out or removing the server from the rack may cause not only the server to operate incorrectly but also the server to fall on people to make them injured.
Stay away from the fan. Keep your hand or hair away from the cooling fan on the rear of the server. Failure to follow this warning may get your hand or hair caught in the fan, resulting in injury.
Avoid contact with the server during thunderstorms. Disconnect the power plug from the outlet when a thunderstorm is approaching. If it starts thundering before you disconnect the power plug, do not touch any part of the server including the cables. Failure to follow this warning may cause a fire or an electric shock.
Keep animals away from the server. Failure to follow this warning may cause a fire or an electric shock.
Do not place any object on top of the server. The server may fall and cause property damage to the surroundings.
Do not leave the server with its optical disk drive tray ejected. Dust may enter the server through openings and cause malfunctions of the server. Any person may also bump it and get injured.

FOR PROPER OPERATION

Observe the following notes for successful operation of the server. Use of the server ignoring the notes will cause malfunctions or failures of the server.

- Install the rack assembly in a place that meets requirements for successful operation. For details, see Chapter 3, "Setting Up Your Server."

- The server is intended for installation in a Restricted Access Location, mounted above a non-combustible material.

- Make sure to power off the server before connecting or disconnecting cables between the server and peripheral devices.

- Verify that the access LED on the server is unlit before turning off the server or ejecting the floppy disk.

- The server management logic on your system board monitors and logs system voltage changes. When plugging the power cord to the system, you may experience a delay of 30 seconds or more from the time you press the POWER switch on the front panel. This is normal system operation and is required by the server management logic.

- Do not power off or reset the server, or unplug the power cord from the server until the POST (Power On Self-Test) completes. See Chapter 2 for details of POST.

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

- When unplug the power cord(s) from the server, wait at least 30 seconds before re-plugging the power cord(s) to the server.

- Turn off the power and unplug the power cord from the outlet before relocating the server.

- Clean the server on a regular basis. (See Chapter 7 for cleaning.) Regular cleaning proactively prevents various failures of the server.

- Lightning may cause a momentary voltage drop. To prevent this problem, it is recommended to use of an uninterruptible power supply unit.

- Check and adjust the system clock before the operation if any of the following conditions is applicable.

  - After carriage of device

  - After storage of device

  - After the device is entered into the pause state under the environmental condition enduring device operation (temperature: 10°C - 35°C, humidity: 20% - 80%)

- Check the system clock at the rough rate of once per month. When the system clock is installed in a system requiring high time precision, it is recommended to use a time server (NTP server).
  If the system clock is remarkably delayed or advanced as the passage of time in spite of adjustment, contact your service representative to ask maintenance.

TRANSFER TO THIRD PARTY

The following must be observed when you transfer (or sell) the server or software provided with the server to a third party:

Make sure to provide this manual along with the server to a third party.

> **IMPORTANT:** About data on the hard disk drive
>
> Be sure to take appropriate measures not to leak important data (e.g., customers' information or companies' management information) on the removed hard disk drive to any third parties.
>
> Data seems to be erased when you empty "Recycle Bin" of Windows or execute the "format" command of the operating system. However, the actual data remains written on the hard disk drive. Data not erased completely may be restored by special software and used for unexpected purposes.
>
> It is strongly recommended that the software or service (both available at stores) for data erasure should be used in order to avoid the trouble explained above. For details on data erasure, ask your sales representative.

Provided software

To transfer or sell any software application that comes with the server to a third party, the following requirements must be satisfied:

- All provided software applications must be transferred and no backup copies must be retained.

- Transfer requirements listed in "Software License Agreement" that comes with each software application must be satisfied.

- Software applications that are not approved for transfer must be uninstalled before transferring the server.

DISPOSAL AND CONSUMABLES

- Dispose of the server, internal devices, or DVD/CD-ROMs according to laws and regulations of the central and/or local government.

> **IMPORTANT:**
>
> - For disposal (or replacement) of the battery on the mother board of the server, consult with your service representative.
>
> - It is user's responsibility to completely erase or modify all the data stored in storage devices such as hard disk drives so that the data cannot be restored.

- Your server contains some components that work for a limited period of time and require replacement, such as fans, internal batteries, the internal optical disk drive, the floppy disk drive, and the mouse. For stable operation of the server, NEC recommends you replace these components on a regular basis. Consult with your service representative for replacement.

REGARDING THE TRANSPORTATION OF THIS SYSTEM

This system and/or associated options and accessories may be using lithium metal batteries or lithium ion batteries.

There may be restrictions regarding the air or sea transportation of such lithium batteries.

Please contact your reseller or service company prior to transporting this system and/or its options.

USER SUPPORT

Before Asking for Repair, do the following when the server appears to fail:

1. Check if the power cord and the cables to other devices are properly connected.

2. See Chapter 8 to find if your problem fits the description. If it does, take the recommended measure for it.

3. Check if the software required for operation of the server is properly installed.

If the server still appears to fail after you have taken the above actions, consult with your service representative immediately. Take notes on lamp indications of the server and alarm indications on the display unit before consultation, which may provide a significant help to your service representative.

Advice for Health

The longer you keep using the computer equipment, the more you become tired, which may cause disorders of your body. When you use a computer, observe the following to keep yourself from getting tired:

Good Working Posture
You have good posture if the following are satisfied when you use a computer:
- You sit on a chair with your back straight.
- Your hands are parallel with the floor when you put them on the keyboard.
- You look at the screen slightly lower than your eye height.
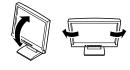
You have "good working posture" as described in the above when no part of your body is under excess strain, in other words when your muscles are most relaxed.

You have "bad posture" when you sit with your back hunched up or you operate a display unit with your face close to the screen. Bad working posture may cause eye strain or poor eyesight.
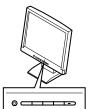
Adjustment of Display Unit Angles
Most display units are designed for adjustment of the horizontal and vertical angles. This adjustment is important to prevent the screen from reflecting bright lights and to make the display contents easy to see. You will not be able to keep "good working posture" and you will feel more tired than you should if you operate a display unit without adjusting horizontal and vertical angles.

Adjustment of Screen Brightness and Contrast
The display unit has brightness and contrast adjustment functions. The most suitable brightness and contrast depend on the individual and the working environment (well-lighted room or insufficient light). Adjust brightness and contrast so that the screen will be easy to see. An extremely bright or dark screen will give a bad effect to your eyes.

Adjustment of Keyboard Angle
The keyboard provided with the server is designed for adjustment of an angle. Adjust the keyboard angle at which the keyboard is easy to operate. The adjustment assists in reducing strain on your shoulders, arms, and fingers.

Cleaning of Equipment
Clean equipment regularly. It is difficult to see the display contents on a dusty screen. Keeping equipment clean is also important for your sight.

Fatigue and Rest
If you feel tired, you should stop working and do light exercises.

Chapter 2
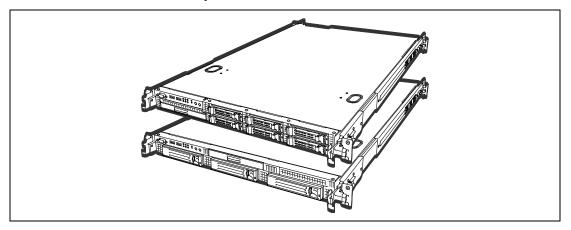
General Description

This chapter provides information that you should be familiar with before using the server. It includes names and functions of the components and features of the server.

OVERVIEW

Your server is a modular, multiprocessing server based on the Intel® Xeon® microprocessor. It is a solid performer and offers the latest technology. The combination of compute performance, memory capacity, and integrated I/O provides a high performance environment for many server market applications. These range from large corporations supporting remote offices to small companies looking to obtain basic connectivity capability such as file and print services, e-mail, web access, web site server, etc.

Your server is housed and available as a rack-mount system. Your server conveniently installs into a standard EIA 19-inch rack assembly.
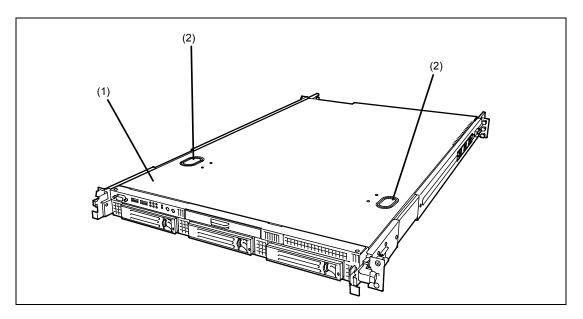
Your server includes a optical disc drive and three (SATA) or six (SATA or SSD or SAS) hard disk drive bays. The hot-swap hard disk drive bays support 1.0-inch hard disk drives that can be swapped in or out of the system without powering it down, if RAID functionality is configured in the system.
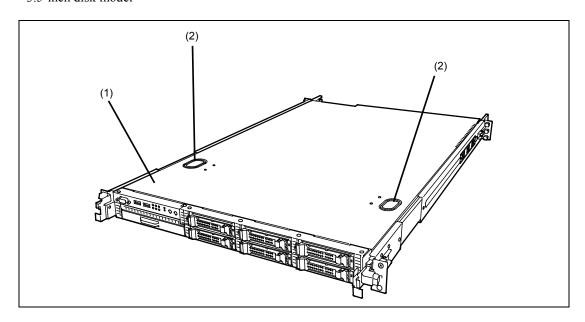
As application requirements increase, you can expand your server with an additional processor, additional memory, add-in boards and peripheral devices, and hard disk drives.

External View

2.5-inch disk model

3.5-inch disk model
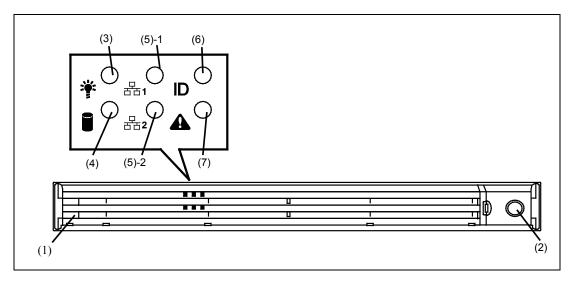
(1)   Top cover
Remove the top cover to install/remove DIMM, CPU, or PCI card.

(2)   Release buttons
Push these buttons to remove the top cover.

NAMES AND FUNCTIONS OF PARTS

The following figure shows the location of the front system features.

Front View with Front Bezel Closed
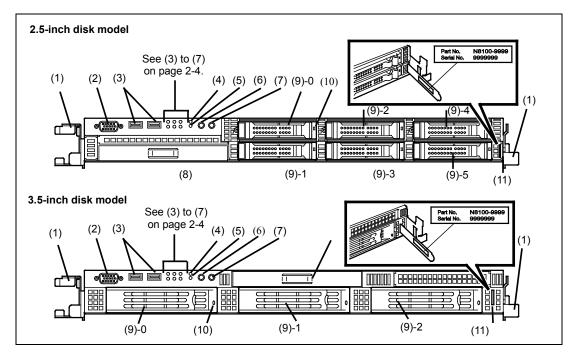
(1)   Front bezel
The front bezel is a cover protecting the front devices during daily operation. A security key is provided to lock the cover. (See page 2-17.)

(2)   Key slot
Insert the security key into this slot when unlocking the front bezel. (See page 2-17.)

(3)   POWER LED (green)
This LED turns green when the power is turned on. It flashes while the server is in standby status. (See page 8-3.)

(4)   DISK ACCESS LED (green/amber)
This LED is green during access to the internal hard disk drives. The LED turns amber when even one of the internal hard disk drives fails. (See page 8-5.)

(5)   ACT LED (green)
This LED is on while the system is connected to the network. The number "1" on the icon indicates LAN port 1, and the number "2" indicates LAN port 2. (See page 8-5.)

(6)   UID LED (blue)
This LED goes on when the UID switch is pressed. (The LED also goes on or flashes when software issues a command.) (See page 8-5.)

(7)   STATUS LED (green/amber) (on the front panel)
This LED indicates the server status. The LED is green during normal operation. The LED turns amber or flashes when the server enters the abnormal state. (See page 8-3.)

Front View with Front Bezel Removed

(1)   Handles (1 at the right and left each)
Hold the handles when dismounting/mounting the server from/in the rack.
(2)   Monitor connector
Connect the display unit to this connector. Exclusively used with the one on the rear panel.
(See page 3-18.)
(3)   USB connectors (2 ports)
Connect device compliant with the USB interface to the connectors. (See page 3-18.)
(4)   RESET switch
Press this switch to reset the server. (See page 8-59.)
(5)   DUMP (NMI) switch
Press this switch to dump system memory. (See page 3-22.)
(6)   POWER switch
Press this switch to turn on/off the power. (See page 2-19.)
Pressing the switch once turns on the power, and the POWER LED goes on. Pressing it
again turns off the power. Continuing to press the switch for 4 seconds or more forcibly
turns off the power. (See page 8-60.)
* This server does not support sleep functions.
(7)   UID (Unit ID) switch
Press this switch to turn on/off the UID LEDs on the front and rear panels of the server.
Pressing the switch once turns on the LEDs. Pressing it again turns them off. (See page
2-24.)
(The LED also goes on or flashes when software issues a command.)
(8)   Optical disk drive bay
Attach an optional optical disk drive. (See page 2-25.)
One of the following drives will be installed, according to the model or the purchase order.
DVD-ROM drive
DVD Super Multi drive

(9)   Hard disk drive bays

Mount hard disk drives in the bays. The last digit indicates the channel number. The hard disk drives must be purchased separately. (See page 9-7.)

3.5-inch disk model: up to 3 drives

2.5-inch disk model: up to 6 drives

(10)   DISK LED (green/amber)
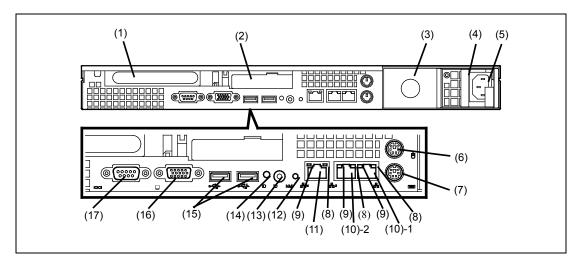
Hard disk drive LED. (See page 8-6.)

Each hard disk drive LED is green during access to the hard disk drive. The LED turns amber if the hard disk drive fails. The LED flashes switching back and forth between green and amber during build processing (only in RAID System).

(11)   Slide tag

A label indicating the N code and serial number of the server is attached.

Rear View

(1) Full-height PCI card slot (1B)
Mount a PCI card of the full-height type in the slot. (See page 9-48.)

(2) Low-profile PCI card slot (1C)
Mount PCI card of the low-profile type into this slot. (See page 9-48.)

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

(3) Blank panel (for additional power supply unit)
Install an optional power supply unit in this slot. (See page 9-20.)

(4) Power supply unit
Factory-installed power supply unit

(5) AC inlet
Connect the power cord to this socket. (See page 3-18.)

(6) Mouse connector
Connect the mouse to this connector. (See page 3-18.)

(7) Keyboard connector
Connect the keyboard to this connector. (See page 3-18.)

(8) Speed LED (green/amber)
This LED indicates the transmission speed of the LAN. (See page 8-8.)

(9) LINK/ACT LED (green)
This LED indicates the access status of the LAN. (See page 8-8.)

(10) LAN connectors
Connect network systems on the LAN to the connectors (1000BASE-T/100BASE-TX/10BASE-T). (See page 3-18.)
The number "1" following the parenthesized number indicates LAN port 1, and the number "2" indicates LAN port 2.
If [Shared BMC LAN] is set to [Enabled] on BIOS SETUP, the LAN port 1 can be used as management LAN not only used as data transmission port. However, it is not recommended in consideration of performance and security, because the LAN port 1 may receive both normal data and management data. (See page 4-28.)

(11)   Management LAN port

100BASE-TX/10BASE-T interface port used to manage the server via LAN. (See page 8-8.)
This port is used for connection with EXPRESSSCOPE Engine 2, and cannot be used as a
data transmission port.

(12)   DUMP (NMI) switch

Press this switch to dump system memory.

(13)   UID switch

Press this switch to turn on/off the UID LEDs on the front and rear panels of the server.
Pressing the switch once turns on the LEDs. Pressing it again turns them off. (See page
2-24.)

(14)   UID LED (blue)

This LED goes on when the UID switch is pressed. (The LED also goes on when software
issues a command.) (See page 8-5.)

(15)   USB connectors

Connect device compliant with the USB interface to this connector. (See page 3-18.)

(16)   Monitor connector

Connect the display unit to this connector. Exclusively used with the one on the front panel.
(See page 3-18.)

(17)   Serial port (COM) connector
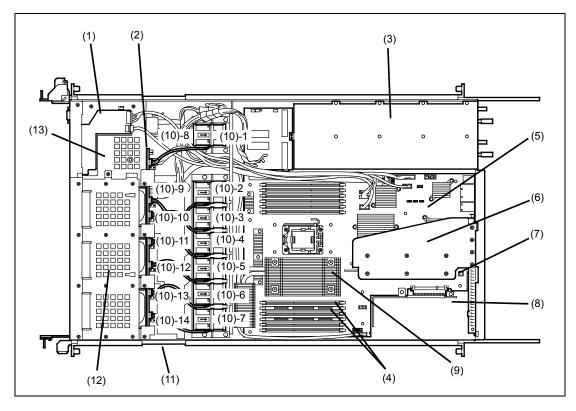
Connect device having a serial interface to this connector. (See page 3-18.)
A leased line cannot be connected directly to this connector.

INTERNAL VIEW

The internal view for each model is shown below. The processor air duct factory-installed in the system is omitted for clarity.

2.5-inch Disk Model
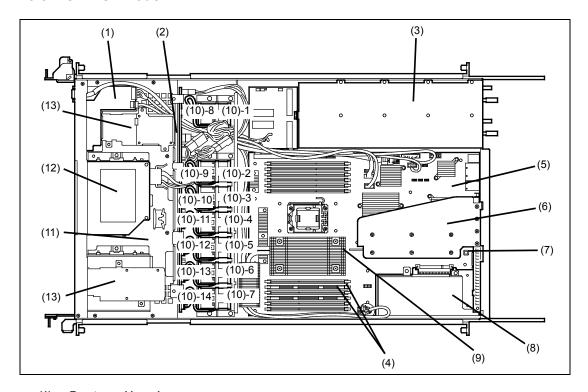
(1)   **Front panel board**
(2)   **Backplane**
(3)   **Power supply**
(4)   **DIMM**
(5)   **Motherboard**
(6)   **PCI riser card**
(7)   **Top cover open sensor**
(8)   **Dedicated RAID Controller slot**
(9)   **Processor** (mounted under the heat sink)
(10)   **Cooling fans**

(10)-1 FAN1R	(10)-2 FAN2R	(10)-3 FAN3R	(10)-4 FAN4R
(10)-5 FAN5R	(10)-6 FAN6R	(10)-7 FAN7R	(10)-8 FAN1F
(10)-9 FAN 2F	(10)-10 FAN3F	(10)-11 FAN4F	(10)-12 FAN5F
(10)-13 FAN6F	(10)-14 FAN7F		

(11)   **RAID Controller battery bay**
(12)   **Hard disk drive bays**
(13)   **Optical disk drive bay**
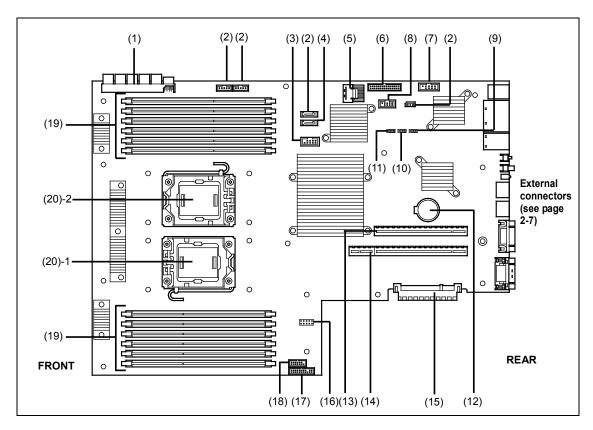
3.5-inch Disk Model

(1) Front panel board
(2) Backplane
(3) Power supply
(4) DIMM
(5) Motherboard
(6) PCI riser card
(7) Top cover open sensor
(8) Dedicated RAID Controller slot
(9) Processor (mounted under the heat sink)
(10) Cooling fans

(10)-1 FAN1R	(10)-2 FAN2R	(10)-3 FAN3R	(10)-4 FAN4R
(10)-5 FAN5R	(10)-6 FAN6R	(10)-7 FAN7R	(10)-8 FAN1F
(10)-9 FAN 2F	(10)-10 FAN3F	(10)-11 FAN4F	(10)-12 FAN5F
(10)-13 FAN6F	(10)-14 FAN7F		

(11) Hard disk drive bays
(12) Optical disk drive bay
(13) RAID Controller battery bay
Install an optional RAID Controller battery in this bay. (See page 9-62.)

Motherboard

(1) **Power connector**
(2) **Unused connector**
(3) **USB connector (front)**
(4) **SATA DVD connector**
(5) **SATA connector**
(6) **Fan connector**
(7) **Optional COM connector**
(8) **HDD BP connector**
(9) **CMOS clear jumper switch** (see page 4-61)
(10) **Password clear jumper switch** (see page 4-61)
(11) **RAID configuration jumper switch**
(12) **Lithium battery**
(13) **Connector for PCI riser card slot (for low-profile card)**   (See **PCI Card** on page 9-48.)
(14) **Connector for PCI riser card slot (for full-height card)**
(15) **Connector for RAID controller**
(16) **USB memory module connector**
(17) **Front panel connector**
(18) **Front video connector**
(19) **DIMM sockets** (see page 9-26)
(20) **Processor sockets**
     (20)-1 Processor #1 (CPU#1)   (20)-2 Processor #2 (CPU#2)

STANDARD FEATURES

The server you have purchased has the following features.

High performance
- Intel® Xeon® processor
  N8100-1660F: 2GHz, 2 cores
  N8100-1654F/1661F/1717F/1724F: 2.00GHz, 4 cores
  N8100-1655F/1662F/1718F/1725F: 2.40GHz, 4 cores
  N8100-1656F/1663F: 2.66GHz, 4 cores
  N8100-1719F: 2.40GHz, 6 cores
  N8100-1657F/1720F: 2.26GHz, 6 cores
  N8100-1658F: 2.93GHz, 6 cores
  N8100-1722F: 3.06GHz, 6 cores
  N8100-1659F: 3.33GHz, 6 cores
  N8100-1723F: 3.46GHz, 6 cores
- High-speed memory access (DDR3 1333 supported)
- High-speed disk access
  (SATA or SSD or SAS (Serial Attached SCSI)[*1]
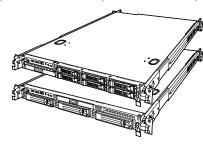
Expandability
- PCI Express 2.0 (16 lanes): 1 slot (full height)
  PCI Express 2.0 (4 lanes): 1 slot (low profile)
  PCI Express 2.0 (4 lanes): 1 slot (dedicated to RAID controller) [*2]
- Can be changed to PCI-X slot by using the optional riser card.
- Large memory of up to 192GB[*2]
- Up to two multi-processors are available for upgrade.
- Three network ports (one for management LAN)
- Hard disk drive bays
  3.5-inch disk model: up to 3 hard disk drives
  2.5-inch disk model: up to 6 hard disk drives
- USB2.0 interface

Management utilities
- NEC ESMPRO
- ExpressUpdate feature
- Remote monitoring feature (EXPRESSSCOPE Engine 2)
- RAID system management utility (Universal RAID Utility)
- Hard disk drive monitoring feature

Maintenance features
- Off-line maintenance utility
- Memory dump feature using the DUMP switch

Power saving and noiseless design
- Power monitoring feature
- Power control feature
- High-efficiency power supply supporting 80 PLUS®
- Fan control appropriate to environment, work load, and configuration
- Noiseless design

High reliability
- Memory monitoring feature (error correction/error detection)
- Memory degeneracy feature (logical isolation of a failed device)
- Memory x4/x8 SDDC feature
- Memory mirroring/LockStep feature (x8 SDDC)/memory sparing feature
- Bus parity error detection
- Temperature detection
- Error notification
- Internal fan monitoring feature
- Internal voltage monitoring feature
- Redundant power supply (hot-swappable)
- Onboard RAID Controller (disk array)
  (a 3.5-inch disk model is also supported as an option)
- Auto-rebuild feature (hot-swappable)
- BIOS password feature
- Mechanical security lock

Many built-in Features
- Redundant power supply feature (with optional power supply unit installed)
- El Torito Bootable CD-ROM (no emulation mode) format supported
- Power switch mask
- Software power-off
- Remote power-on feature
- AC-Link feature
- Remote console feature
- Front monitor connector

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

Easy setup
- NEC EXPRESSBUILDER (system setup utility)
- Parameter File Creator
- SETUP (BIOS configuration utility)

*1. The 3.5-inch disk model only supports SATA.
*2. When two CPUs are used. The maximum memory capacity is 96GB when one CPU is used.

Peripheral Bays

The system supports a variety of standard PC AT-compatible peripheral devices. The chassis includes these peripheral bays:

- Three 5.25-inch file bays for installing 5.25-inch peripheral devices such as optional tape drives. (An optical disk drive is factory-installed.)
- The 3.5-inch disk cage can contain up to four SATA or SAS hard disk drives.
  The 2.5-inch disk cage can contain up to eight SAS hard disk drives.

AC LINK Feature

When the power cord of the server is connected to an uninterruptible power supply (UPS) unit, the server supports the power linkage feature that enables control over the power supply from the UPS to the server. The AC LINK feature can be enabled or disabled with Power Management Setup in the Server menu of the BIOS setup utility, "SETUP." (See Chapter 4.)

Security

The BIOS setup utility provides a number of security features to prevent unauthorized or accidental access to the system. Once the security measures are enabled, access to the system is allowed only after the user enters the correct password(s). For example:

- Set and enable an administrative password.
- Set and enable a user password
- Check the user account when entering the BIOS setup utility or booting the system.

NEC EXPRESSBUILDER

The DVD of this server's accessories contains a setup utility called "NEC EXPRESSBUILDER".
The major functions of the NEC EXPRESSBUILDER are:

- To install the Operating System.
  "Express Setup" helps you to install the Windows Operating System. (See Chapter 5)

- To diagnose the server.

  NEC EXPRESSBUILDER includes System Diagnostics to check this server. (See
  Chapter 7)

- To create a driver disk.

  Use this function to create "OEM-disk for Windows" used for a manual installation of
  Windows. (See Appendix D-F)

- To update System BIOS

  Use this function to update the server's system BIOS or firmware. (See Chapter 8)

- To update Windows system*

  "Update the system" in the Autorun menu (See Chapter 6) updates the several drivers of
  Windows on the server.

- To install several management utilities*

  NEC EXPRESSBUILDER includes the management utilities (NEC ESMPRO, Universal
  RAID utility and so on). You can install the applications from NEC EXPRESSBUILDER.
  (See Chapter 6)

- To read several documents*
  You can refer to the documents from the Autorun menu. (See Chapter 6)
  * These functions are available on Windows system.

  > **NOTE:** Some features among those listed above can be used from the
  > remote computer via cross cable (COM), or LAN. See Chapter 6 for
  > details.

NEC ESMPRO

The NEC ESMPRO is server management software that runs on the OS.

The NEC ESMPRO Manager is a management software that enables you to manage and monitor the servers remotely. To use this software, it is required to install apposite bundled software on the server.

> **NOTE:** For details of major functions of the NEC ESMPRO, system configuration and setups with the NEC ESMPRO, see Chapter 6. Available functions of the NEC ESMPRO depend on the OS you install. Ask your service representative for details.

Maintenance Tools

The Maintenance Tools is used for maintenance and fault analysis of the server. This tool is usually used by the service representative.

System Diagnostic Utility

The system diagnostic utility contained in the NEC EXPRESSBUILDER is useful to detect hardware failures. See Chapter 7 for details.

Remote Management

The server may be monitored and managed via LAN/WAN by using EXPRESSSCOPE Engine 2 and NEC ESMPRO Manager utility stored in NEC EXPRESSBUILDER DVD-ROM.

The EXPRESSSCOPE Engine 2 provides the following features:

- Monitoring of temperature, voltage, fans, and electric power status

- Monitoring of power supply unit

- Monitoring of hard disk drives

- Generation of SEL (system event log) at occurrence of hardware failure

- Monitoring of the system management watchdog timer

- Monitoring of the periodic SMI timer

- Remote management by using Web browser (e.g., resetting the server, power on/off, viewing System Event Log (SEL))

- Remote KVM and remote device features (A separately priced remote management license is required.)

- Remote management via LAN/WAN by using NEC ESMPRO Manager and centralized management of several systems

For more information about remote management using Web browser, remote KVM feature, and remote device feature, refer to the "EXPRESSSCOPE Engine 2 User's Guide" stored in NEC EXPRESSBUILDER DVD-ROM.

> **NOTE:** To use the Remote Management Extended License (N8115-03), visit our Web site to see the latest information about remote console/remote media feature.

USING YOUR SERVER

This section describes the basic operations of the server including how to use devices such as the optical disk drive.

Installing or Removing the Front Bezel
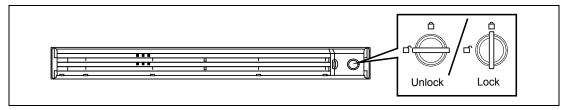
When turning the power of the server on/off, accessing the optical disk drive, or installing or removing a hard disk drive on or from a hard disk drive bay, first remove the front bezel.

> **IMPORTANT:**
>
> The front bezel can be opened only when you unlock it by using the attached security key.
> Do not press the POWER switch when installing or removing the front bezel.
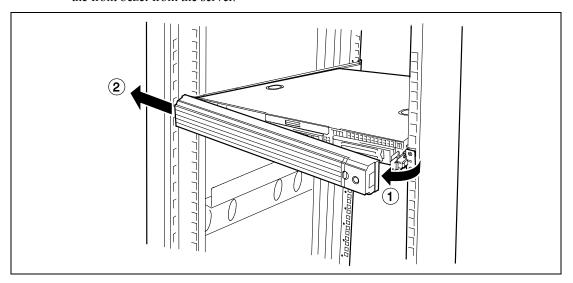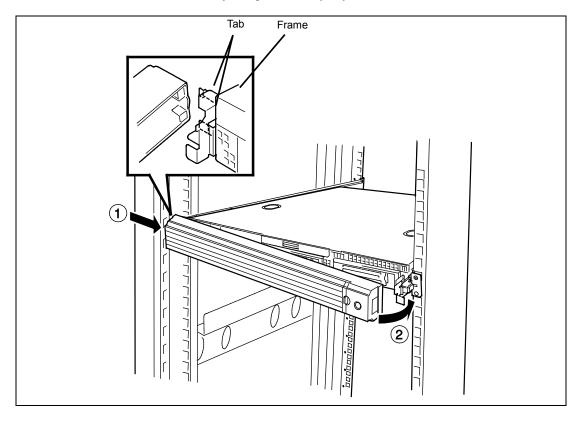
1. Insert the attached security key into the key slot and turn the key to the front bezel side while pressing it lightly to release the lock.

2. Hold the right end of the front bezel carefully to pull it toward you.

3. Slide the front bezel to the left a little to release the tab from the frame and then remove the front bezel from the server.

To install the front bezel, latch the tab at the left side of the front bezel on the server frame. After the installation, lock the front bezel by using the security key.
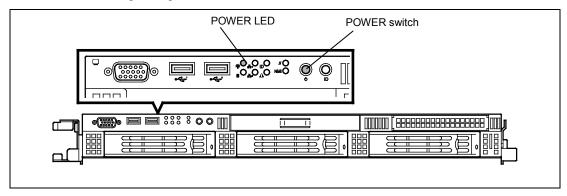
POWER Switch

Use the POWER switch to turn on/off the server.

Power On

Press the POWER switch on the front of the computer chassis.

The POWER LED lights in green.

IMPORTANT:

■ If the power cord is connected to a power control device such as a UPS (Uninterruptive Power Supply), make sure that the power control device is powered.

■ If the power cord is connected to the server, an initial diagnosis of the hardware starts. The POWER switch does not work while in diagnosis. Wait for about 30 seconds, then press the POWER switch.

■ Always allow POST to complete before powering down your system.

POST

POST (Power On Self-Test) is the self-diagnostic program stored in the system memory.

When you power on the server, the system automatically runs POST to check the mother board, ECC memory module, CPU module, keyboard, and mouse. POST also displays messages of the BIOS Setup utility, such as the start-up message, while in progress.

NEC

With the factory setup of the server, the NEC logo appears on the display unit while POST is in progress. (To display the POST check results, press **Esc**.)

You do not always need to check the POST check results. Check the messages that POST displays when:

- ■   you use the NEC Express server for the first time.
- ■   the server appears to fail.
- ■   the server beeps many times between power-on and OS start-up.
- ■   an error message appears on the display unit.

POST Execution Flow

The following describes the progress of POST in the chronological order.

> **IMPORTANT:**
>
> - Do not power off the server while POST is in progress.
>
> - Do not make key entries or perform mouse operations while POST is in progress.
>
> - Some system configurations may display the message "Press Any Key" to prompt a key entry. This message is driven by BIOS of an installed optional board. Make sure to read the manual that comes with the optional board before any key entry.
>
> - Powering on the server, after you installed or removed an optional PCI board or moved it to another slot, may display the message that indicates incorrect board configuration and suspend POST.
> In such a case, press **F1** to continue POST. Board configuration can be made using the utility described later.

1. After a few seconds from power-on, POST starts checking the memory. The count message of the basic and expansion memory appears at top left on the display unit screen. The memory check may takes a few minutes to complete depending on the memory size of the server. Also, it may take approximately one minute for the screen display to appear after rebooting the server.

2. Some messages appear upon completion of the memory check. These messages appear to indicate that the system has detected the CPU, keyboard, and mouse.

3. After a few seconds, POST displays the following message prompting you to launch the BIOS SETUP utility, stored in the system memory of the server. This message appears at bottom left on the screen.

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

Launch the BIOS setup utility when you need to change the settings to meet the requirements for the server. As long as the above message is not displayed with an error message, you don't have to launch the utility. (Ignore the message. POST will automatically proceed.)

To launch the BIOS setup utility, press **F2** while the above message is displayed. See Chapter 4 for setup and parameters.

The server automatically restarts POST all over again when you exit the SETUP utility.

4. If your server uses Onboard RAID Controller, the following message is displayed to prompt you to run RAID utility.

Press <Ctrl><M> to Run LSI SoftwareRAID Configuration Utility

Press **Ctrl** + **M** to run the utility. For detail explanation, see Chapter 4 for detail.

> **IMPORTANT:** The LSI Software RAID Configuration Utility is used to manage the data stored in hard disk drive, or for maintenance. See Chapter 4 for detail.

5. If the POST detects the optional add-in card, it displays the message prompting you to launch the add-in card BIOS configuration utility. (Ignore the message. POST will automatically proceed a few seconds later.)

Refer to the manual that comes with the optional add-in card for detail.

6. If you set a password using the BIOS SETUP utility, the password entry screen appears upon successful completion of POST.

Up to three password entries will be accepted. Three incorrect password entries disable the server to boot. In such a case, turn off the power and wait about ten seconds before turning on to boot the server.

> **IMPORTANT:** Do not set a password before installing an OS.

7. The OS starts when POST completes.

POST Error Messages

When POST detects an error, it displays an error message on the display unit screen or emits beep code. See Chapter 8 for POST error codes.

> **IMPORTANT:** Take a note on the messages displayed before consulting with your service representative. Alarm messages are useful information for maintenance.

Power Off

Follow the procedure below to power off the server. If the power cord of the server is connected to a UPS, refer to the manual that comes with the UPS or the manual for the application that controls the UPS.

> **IMPORTANT:** Always allow POST to complete before turning off the server.

1. Shut down the OS.
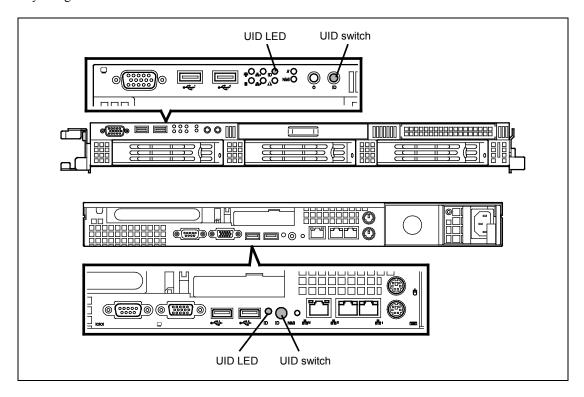
2. Press the POWER switch on the front of the server.
The POWER/SLEEP lamp goes out.

3. Power off peripheral devices.

> **NOTE:** The standby function of Windows Server is not available. Do not select "Standby" in the Windows shutdown menu.

Identification of Servers ~ UID Switch ~

A UID (Unit ID) LED is provided on the front panel and rear panel. If more than one server is mounted in a single rack, the LED identifies the server you are performing maintenance on.
The UID LED turns on or blinks when the UID (Unit ID) switch on the front panel is pressed. It goes off when the switch is pressed again.
Maintenance from the rear of the rack has to be carried out in a dark, narrow space. The interface cable of a server or power supply unit in normal state may be disconnected by accident in this situation. To prevent this problem, you should start maintenance after confirming the target server by using the UID switch.

Optical Disk Drive

The server is provided with the optical disk drive bay on its front to read data from a disc. The following optical disk drives can be installed in this server:

- DVD-ROM drive (option)
  This drive can read a variety of optical discs.
- DVD Super Multi drive (option)
  This drive can read and write a variety of optical discs.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details.
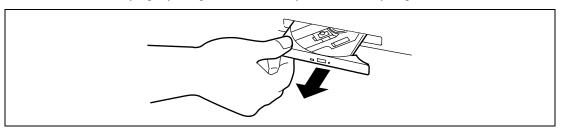
Do not leave the drive open.

Insert a disc in the optical disk drive using the following procedure:
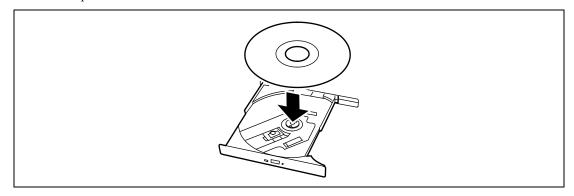
1. Confirm that the power of the server is on (the POWER LED should be lit) before inserting the disc in the optical disk drive.
2. Press the Eject button on the front of the optical disk drive.

   The tray comes out a little.
3. Hold the tray lightly and pull it out toward you until the tray stops.
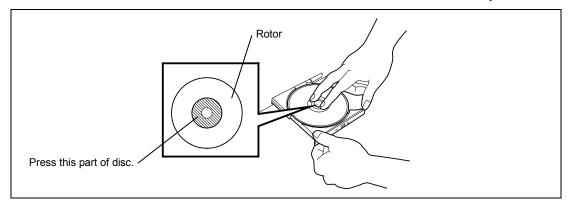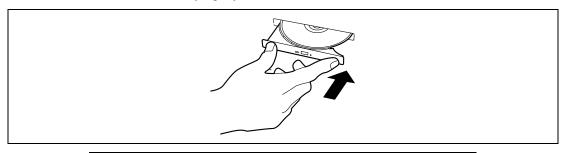
4. Put the disc on the tray carefully and securely with the character printed surface facing upward.

5. As shown in the figure below, hold the tray with a hand and press the disc with fingers of another hand to make the hole of the disc fit to the rotor at the center of the tray.
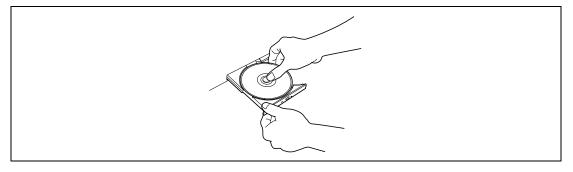
6. Push the front of the tray lightly to return it into the drive.

> **IMPORTANT:** If a noisy sound in driving the optical disk drive occurs after inserting a disc, insert it again correctly.

To take out the disc from the optical disk drive, press the Eject button in the same way as when inserting the disc to make the tray come out.
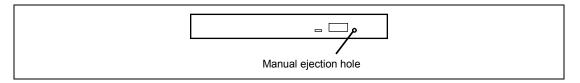
If the access LED is lit, the disc is being accessed. Confirm that the access LED is not lit before pressing the Eject button.

As shown in the figure below, hold the tray with one hand and hold the edges of the disc lightly with the fingers of the other hand while the pushing down on the rotor at the center of the tray to remove the disc from the tray.

After taking out the disc, return the tray into the drive.

If you fail to eject the tray with the Eject button and remove the disc from the server, follow the procedure below.

Manual ejection hole

1. Press the POWER switch to power off the server. (The POWER LED goes off.)

2. Insert a metal pin of approximately 1.2 mm in diameter and 100 mm in length (a straightened large paper clip will suffice) into the manual ejection hole on the right front of the optical disk drive and gently push it in until the tray is ejected.

IMPORTANT:
- Do not use a toothpick or plastic stick that is easy to break.
- If the above procedure does not let you take out the disc, contact your service representative.

3. Hold the tray and pull it out.

4. Take out the disc.

5. Push the tray back into position.

NOTE: Use of Discs
Keep the following notes in mind when using discs in the server:
- Discs that do not conform to CD standards may not be able to be played back.
- Do not drop the disc.
- Do not place anything on the disc or bend the disc.
- Do not attach any label to the disc.
- Do not touch the signal side (nothing is printed on this side) with your hand.
- Place the disc with its printed side upward and gently put it on the tray.
- Do not scratch the disc or write anything directly on it with a pencil or ball-point pen.
- Keep the disc away from cigarette smoke.
- Do not leave the disc in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).
- If the disc becomes dusty or fingerprinted, wipe the disc from the center to the edge with a dry soft cloth slowly and gently.
- Use CD cleaner to clean the disc. Do not use record spray/cleaner, benzene, or thinner.
- Keep the disc in a disc case when not in use.

Flash FDD

A Flash FDD is a device that has capacity compatibility with a floppy disk drive.

One Flash FDD can be connected to a USB connector of this server. If a floppy disk drive is connected to this server, be sure to disconnect it.

⚠ CAUTION

Be extremely careful not to lose the Flash FDD or have it stolen.

If the Flash FDD is lost, stolen, misappropriated, or fraudulently obtained, there is a risk of leaking confidential information to a third party. NEC assumes no responsibility for damages caused by leaking confidential information in this way.

IMPORTANT:

- The status of the write protection switch of the Flash FDD from before it is connected to this server is applied. Therefore, flipping this switch after connecting the Flash FDD has no effect. If it is necessary to flip this switch during use, temporarily disconnect the Flash FDD from the server, and then flip the switch.

- Be careful not to accidently slide the write protection switch while connecting the Flash FDD to or disconnecting it from the server.

Notes

The Flash FDD is only intended as a temporary means of performing processing such as reading device drivers during installation, so do not use the FDD to back up data.

Compensation for recorded data

NEC will not pay compensation for data recorded on the Flash FDD if the data is lost.

Notes on handling the Flash FDD

- Do not turn off the server while the access LED of the Flash FDD is blinking. Turning off the server at this time can cause a failure or data corruption.

- The Flash FDD is a consumable.

  If the Flash FDD causes an error, use a new Flash FDD.
- The Flash FDD cannot be connected by way of a USB hub.

  Directly connect the Flash FDD to a USB connector of the server.
- Before touching the Flash FDD, discharge static electricity from your body by touching a nearby metal object (such as a doorknob or aluminum frame).

- Do not disassemble the Flash FDD.

- Do not apply a strong force to the Flash FDD.

- Do not place the Flash FDD in an area directly exposed to sunlight or near a heater.

- Do not handle the Flash FDD while eating, drinking, or smoking. Also, be careful not to get thinner, alcohol, or other corrosive substances on the Flash FDD.

- Be careful when connecting the Flash FDD to the server.

- Do not move the server or Flash FDD while the Flash FDD is inserted into a server USB connector. Doing so might cause a Flash FDD failure.

- After using the Flash FDD, disconnect it from the server.

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Chapter 3

Setting Up Your Server

This chapter describes how to set up the server appropriate for your system, on a step-by-step basis.

SETUP FLOW

Follow the flowchart below to set up the server.

Selecting the server site
Select a suitable site for the server and assemble the 19-inch rack assembly.

Unpacking the system
Unpack the server and accessories from the chipping carton box.

Install the server
Install the server into the rack assembly.

Connecting peripheral devices
Connect peripheral devices to the server.

Connecting the power cord
Connect the power cord to the server.

Turning on the server
Power on the server to start software setups. Setups depend on the optional internal devices installed and the peripheral devices connected.

Installing the operating system
Install an operating system to the server. See Chapter 5.

Installing the utilities
Install the utilities in the provided NEC EXPRESSBUILDER DVD. See Chapter 6.

Making backup copies of system information
After all the system setup procedures are completed, make backup copies of system information.
System information is required for recovering the server from the trouble or after replacing the system board.

SELECTING SERVER SITE

To use the server, install it on a standard EIA 19-inch rack assembly.

Refer to the documentation attached to the rack or contact your service representative for the installation of the server on the rack.

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-4 to 1-12 for details.

- Do not use the server in any unapproved place.
- Do not connect the ground line to a gas pipe.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details.

- Do not carry or install the server only by a single person.
- Do not install the server where the load may be concentrated on a specific point.
- Do not install any component on the server only by a single person.
- Insert the hinge pins completely.
- Do not pull out a device from the rack if the rack is unstable.
- Do not leave more than one device being pulled out from the rack.
- Do not provide the wiring exceeding the rating power.
- Do not use the server in a place where corrosive gases exist.

Do not install the rack in the places listed below. Installing the rack or mounting the server on the rack in such a place may cause some malfunction to occur.

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

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

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

- Place of uneven or slanting floor

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

- Place where intense vibration may be generated

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

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

- Place where some objects may be fallen on the rack

- Place near a device generating intense magnetic field (such as a TV, radio, broadcast/communication antenna, power transmission wire, and electromagnetic crane) is placed (If unavoidable, contact your service representative to request proper shield construction.)

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

- Place near equipment that generates power noise (e.g., contact spark at power-on/power-off of commercial power supply through a relay). If you must install the server close to such equipment, request your service representative for separate power cabling or noise filter installation.

> **IMPORTANT:** Increase in temperature within rack and air flow
>
> If more than one server are installed on the rack or the ventilation within the rack is not enough, the temperature in the rack may be raised by the heat generated from the units to be higher than the operation temperature of the server (10 to 35°C).
>
> It causes the server to operate improperly. Review the air flow within the rack or in the room and take sufficient measures so that the temperature within the rack does not exceed the warranted temperature range during the system operation.
>
> The server takes in the air from the front and exhausts it to the rear.

INSTALLING THE SERVER

This subsection provides the instructions for installing the server into a rack cabinet. (This subsection also describes the removal procedures.)

⚠ WARNING
Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-4 to 1-12 for details. ■ Do not use any rack which does not conform to the relevant standard. ■ Always use the server in the specified place.

⚠ CAUTION
Observe the following instructions to use the server safely.   Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details. ■ Do not install/remove the server in/from the rack only by a single person. ■ Do not install the server on the rack leaving the cover removed. ■ Do not pinch your finger with mechanical components. ■ Do not apply any load on the server being pulled out from the rack.
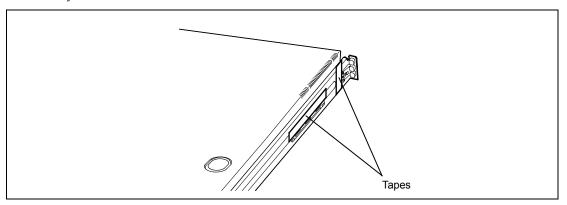
Installation

This server can be installed in either the NEC rack or a third vendor's rack. Take the following steps to install the server in the rack.
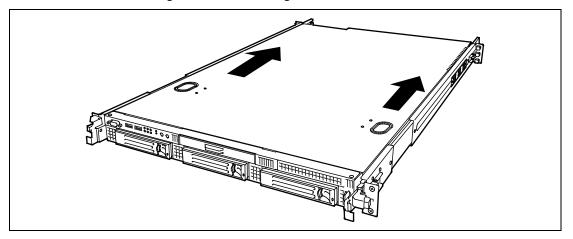
- ■ Preparation for installation

  When shipped from factory, the left and right slide rails are fixed with tapes at the front and side faces to prevent from falling off during transportation. Peel off the tape before you install the server in the rack.

Tapes
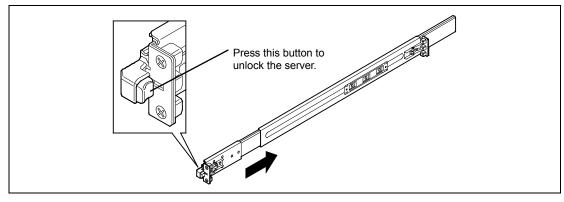
Removing rail assemblies
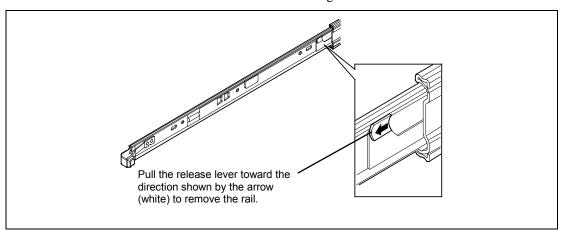
1. Remove the sliding rails from left and right sides of the server.
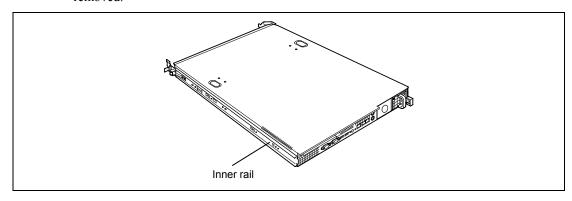
2. While pushing the unlock button on the front of the server, hold the rails and slowly move them toward the rear of the server.

Press this button to unlock the server.
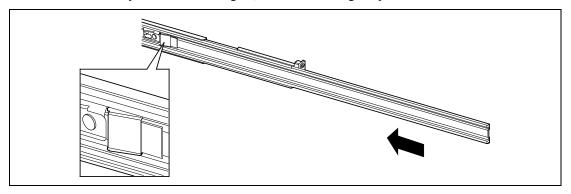
3. After a while, the rails are locked with clicking sound. Pull the release levers on the left and right sides of the server toward direction indicated by an arrow (white) in the figure, and remove them from the server while unlocking it.

Pull the release lever toward the direction shown by the arrow (white) to remove the rail.

4. Only the inner rails remain screwed to the server when the rail assemblies have been removed.

Inner rail

5. While pushing the levers, move the removed rail assemblies toward the direction
indicated by an arrow in the figure, to restore the original position.
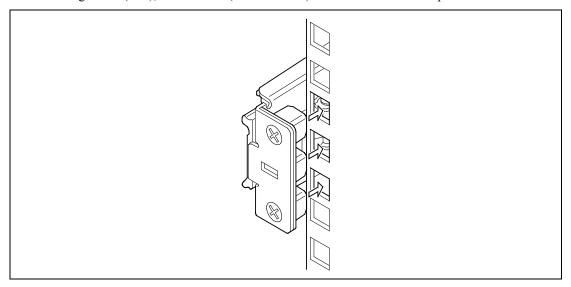
IMPORTANT:

■ The removed rail assemblies are to be installed on the inner rails
later.

■ Be very careful not to get your finger caught in the levers or rails.

Installing Rail Assemblies

1. Insert the square projection of the rail assembly into the angle hole on the 19-inch rack until it is locked with clicking sound.

The figure below shows the right side (front) of the rack. Install the rail assemblies to the right side (rear), and left side (front and rear) of the rack in the same procedure.

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

NOTES:

- There may be some backlashes in the front and rear, however, it is not a deficiency.
- Make sure that the rail assembly is surely locked to the rack.
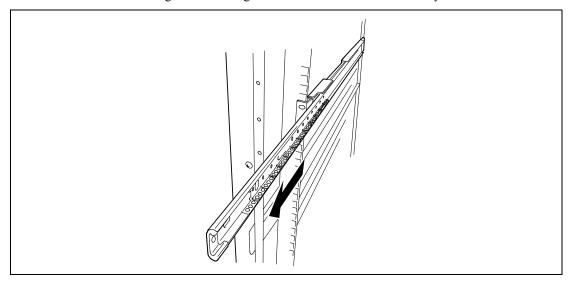
Installing the Server

⚠ CAUTION
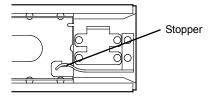
Observe the following instructions to use the server safely.   Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details.

- Do not lift the server only by a single person.
- Do not pinch your finger with mechanical components.

---

1.   Pull out the sliding rails of the right and left rail assemblies until they are locked.
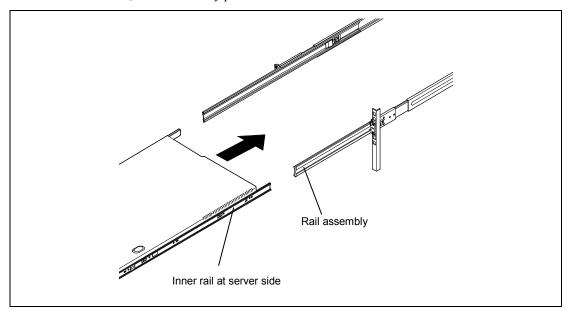
NOTE: Make sure that the sliding rails are surely locked by the stopper.

Stopper

---
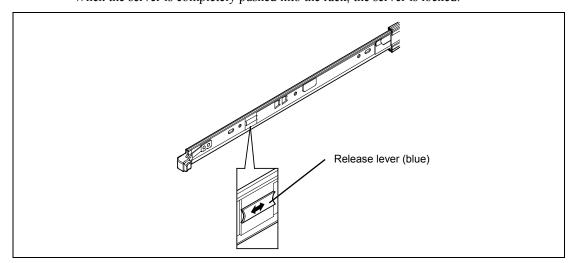
2. At least two persons are required to install the server. Securely hold the server and install it in the rack.

Firmly fit the inner rails on the sides of the server into the rail assemblies that are installed on the rack, and then slowly push the server into the rack.

Rail assembly

Inner rail at server side

3. If the server is locked on its way into the rack, slowly push it in while pressing the release levers (blue) on the right and left sides of the server.

When the server is completely pushed into the rack, the server is locked.

Release lever (blue)

IMPORTANT:

- Be very careful not to get your finger caught in the levers or rails.

- Insert both sides of inner rails straight into the rack.

- Hold the thumbscrews on both sides of the server, and install the server carefully while making sure the installation position.

NOTES:
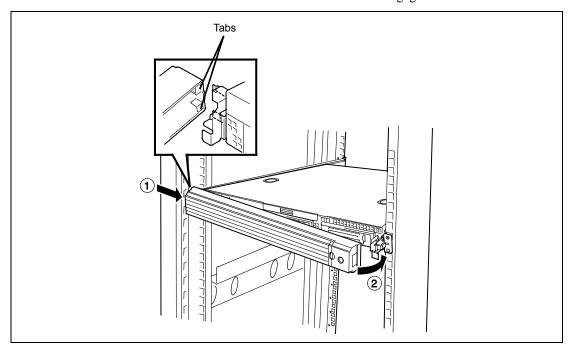
- At the first installation, you may feel strong friction in pushing because the mechanical components cannot be completely engaged with each other. Push the server intensely.

- If the installation is incomplete, either of rails may not go further on its way. In such a case, pull out the server completely until it is locked. Then, push the server in while unlocking the right and left sides of it.

4. Make sure that the sliding rails move smoothly by pulling the server out of the rack and pushing it in several times.

NOTES:

- To install the server in the location adjacent to the other device, pay attention to interference. If the installing server disturbs the other devices already been installed, adjust the position, and install the rail assembly again.

- Make sure that the sliding rails move smoothly. If the sliding rails are stuck to the rack frame and do not come out, reinstall them.

Installing the Front Bezel

1.   Install the front bezel so that the left tab on the front bezel engages with the chassis frame.

Removal

Removing the Server
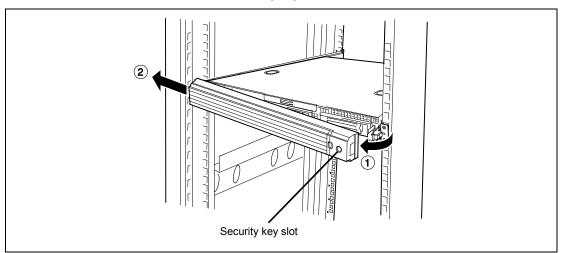
Remove the server from the rack in the following procedure.

⚠ CAUTION
Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details. ■ Do not install/remove the server in/from the rack only by a single person. ■ Do not pinch your finger with mechanical components. ■ Do not apply any load on the server being pulled out from the rack. ■ Do not pull out a device from the rack if the rack is unstable. ■ Do not leave more than one device being pulled out from the rack. ■ Do not pull out the server from the rack while it is operating.

1.   Make sure that the server is off-powered, and disconnect the power cords and all the interface cables from the server.

2.   Unlock the front bezel with the security key.

Security key slot
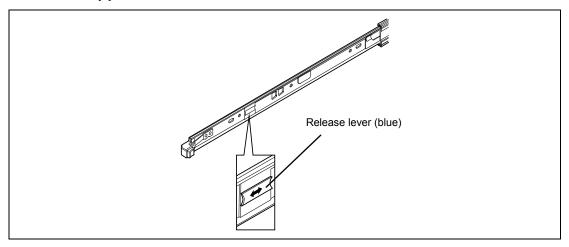
3.   <This step is required only when the optional cable arm is mounted.>

Remove the cable arm from the server.

4. While pushing the left and the right unlock buttons on the front of the server, pull out the server from the rack slowly and carefully.

The server clicks to be latched.

Press this button to unlock the server.

5. While pushing the right and left release levers (blue) forward or rearward to unlock, slowly pull out the server from the rack.

Release lever (blue)

> **IMPORTANT:** Do not apply any load on the server pulled out from the rack. Doing so may cause personal injury if the server drops.

6. Firmly hold the server, and take it out from the rack.

> **IMPORTANT:**
>
> ■ Pull out the server slowly holding the bottom of the server by at least two persons.
>
> ■ Do not apply any load on the server pulled out from the rack. Doing so may cause personal injury if the server drops.
>
> ■ Be very careful not to get your finger caught in the levers or rails.

Removing Rail Assemblies
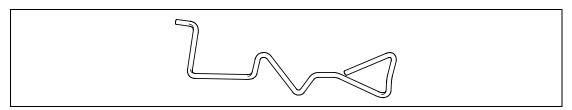
Remove the rail assembly from the 19-inch rack in the following procedure.
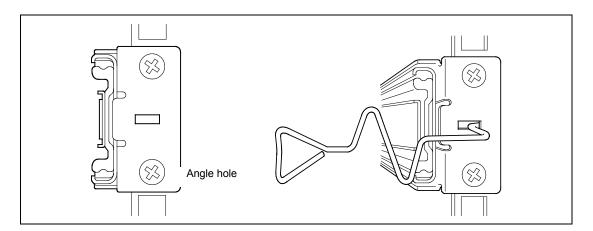
⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details.
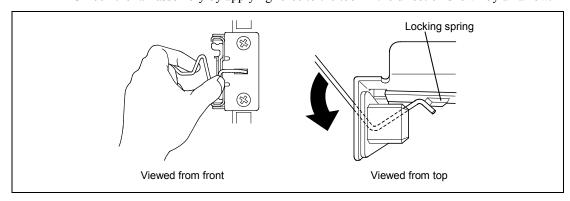
- Do not install/remove the server in/from the rack only by a single person.
- Do not pinch your finger with mechanical components.
- Do not apply any load on the server being pulled out from the rack.
- Do not pull out a device from the rack if the rack is unstable.
- Do not leave more than one device being pulled out from the rack.
- Do not pull out the server from the rack while it is operating.

---

1.   Remove the server from the rack according to "Removing the Server" described earlier.

2.   Prepare the tool to remove the sliding rail (outer rail). The tool is provided with your server.
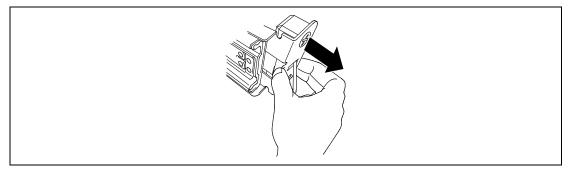
3.   Insert the tool into the angle hole at the front of rail assembly, as shown in the figure below.

Angle hole
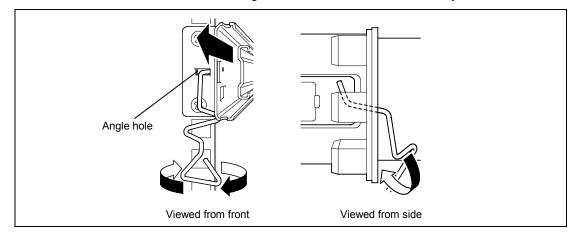
4. Unlock the rail assembly.

Unlock the rail assembly by applying force to the tool in the direction shown by an arrow.

Viewed from front   Viewed from top

Locking spring

5. While the rail assembly is being unlocked, remove it from the rack.

6. Insert the tool into the angle hole at the rear of rail assembly to unlock it.

Rotate the tool as shown in the figure below to unlock the rail assembly.

Angle hole

Viewed from front   Viewed from side

7. While the rail assembly is being unlocked, remove it from the rack.

CONNECTING PERIPHERAL DEVICES

Connect peripheral devices to the server. The server is provided with connectors for wide variety of peripheral devices on its front and rear. The figure on the next page illustrates available peripheral devices for the server in the standard configuration and locations of the connectors for the devices.

⚠ CAUTION
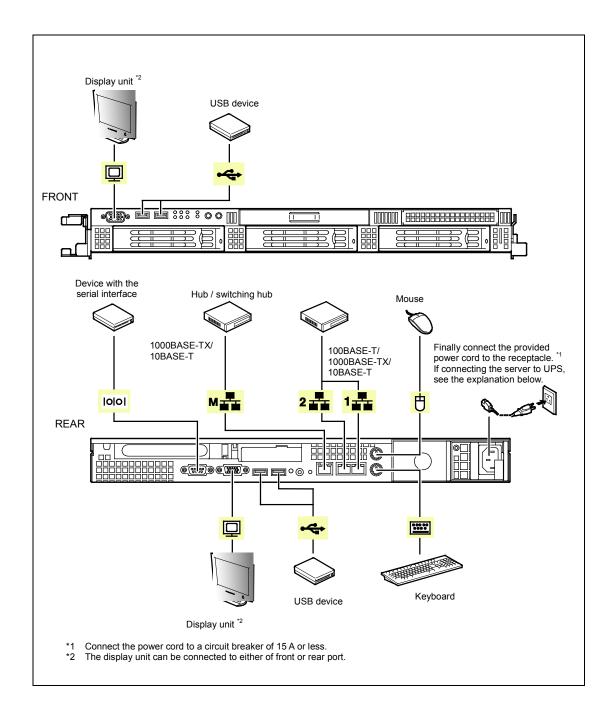
Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details.

- Do not connect any interface cable with the power cord of the NEC Express Server plugged to a power source.
- Do not use any unauthorized interface cable.

IMPORTANT:

- Power off the server and a peripheral device before connection. Connecting a powered peripheral device to the powered server will cause malfunctions and failures.

- To connect a third-party peripheral device or interface cable to the server, consult with your service representative for availability of such a device or cable. Some third-party devices may not be used for the server.

- A leased line cannot be connected directly to the serial port connectors.

- Secure the power cord(s) and interface cables with a tie wrap.

- Form the cables in such a way that they will not come into contact with the door or the guide rails on the sides of the server.

- Do not apply any pressure to the plug of the power cord.

FRONT

Display unit [*2]

USB device

Device with the serial interface

Hub / switching hub

1000BASE-TX/
10BASE-T

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

Mouse

Finally connect the provided power cord to the receptacle. [*1]
If connecting the server to UPS, see the explanation below.

REAR

M

2   1

Display unit [*2]

USB device

Keyboard

*1   Connect the power cord to a circuit breaker of 15 A or less.
*2   The display unit can be connected to either of front or rear port.

CONNECTING POWER CORD

Connect the provided power cord to the server.

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-4 to 1-12 for details.
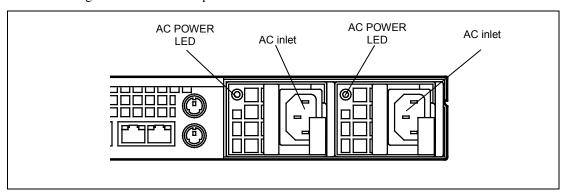
- Do not hold the power plug with a wet hand.
- Do not connect the ground wire to a gas pipe.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details.

- Do not plug the power cord in to an improper power source.
- Do not connect the power cord to an outlet that has an illegal number of connections.
- Insert the power plug into the outlet as far as it goes.
- Use the authorized power cord only.

---

1.   Plug the provided power cord into the power receptacle on the rear of the server.

2.   Plug the other end of the power cord into the wall outlet.

IMPORTANT:

- Connect the power cord to a circuit breaker of 15A or less.
- Secure the power cord with a tie wrap.

To connect the power cord from the server to an uninterruptive power supply (UPS), use service outlets on the rear of the UPS. Refer to the manual that comes with the UPS.

When the power cord from the server to a UPS, change the BIOS setup of the server to link with power supply from the UPS.

To power on the server from the UPS (Uninterruptible Power Supply), select [Server] - [AC-LINK] - [Power On].

Change a parameter for "AC-LINK" under the Server menu of the BIOS SETUP utility. See Chapter 4 for details.

TURNING ON THE SERVER
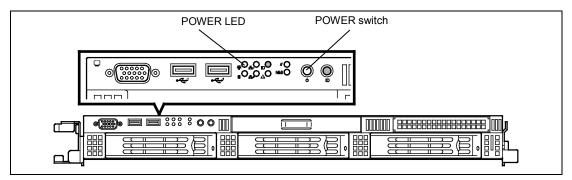
Power on your system as follows.

1. Make sure all external devices, such as a video display, keyboard, and mouse (optional) have been connected, and the power cords are connected.

2. Power on the video display and any other external devices.

> **NOTE:** If the server power cord(s) is connected to a power control unit such as an UPS (Uninterruptible Power Supply), make sure that the power control unit is powered on.

3. Open the front bezel.

4. Press the POWER switch.

The POWER LED on the front of the server comes on.

After a few seconds your system begins the internal Power-On Self Test (POST). POST automatically checks the system board, CPU module, memory, keyboard, and most installed peripheral devices.

> **IMPORTANT:**
>
> ■ Always allow POST to complete before powering down your system.
> ■ The server management logic on your system board monitors and logs system voltage changes. When powering down your system you may experience a 30-second delay from the time you press the push-button power on/off switch on the front panel and your system powering down. This is normal system operation and is required by the server management logic.

If you have problems powering on your system, see Chapter 8.

After you have successfully powered on your system, insert the NEC EXPRESSBUILDER DVD into the optical disk drive, restart the system and follow the screen prompts to run NEC EXPRESSBUILDER.

INSTALLING OPERATING SYSTEM

See Chapter 5 for installing the Microsoft Windows Server 2003 operating systems.

To install the other operating system listed above, contact your service representative.

> **IMPORTANT:** Before installing the operating system, adjust the
> system date and time by using the BIOS setup utility "SETUP." See the
> next chapter for detail.

INSTALLING UTILITIES

Install the utilities that come with the server. See Chapter 6 for details.

MAKING BACKUP COPIES OF SYSTEM INFORMATION

The system information includes the current BIOS settings and any specific information for the
server.

Save the information after completing the system setup.

Without the backup data, you will not be able to recover the information.

You can save the information by the following process.

1. Connect Flash FDD or USB FDD to the USB connector.

2. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive and reboot the
   system.

3. Select [Tool menu (Normal mode)].

4. Select [English].

5. Select [Maintenance Utility].

6. Select [System Information Management].

7. Select [Save].

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Chapter 4

Configuring Your Server

Configuration and setup utilities are used to change your system configuration. You can configure your system, as well as option boards you may add to your system, using the BIOS SETUP Utility. Several unique system parameters are configured using the BIOS SETUP, which is stored in the system FLASH memory.

The RAID configuration utility configures the RAID System and logical drives connected to the Onboard RAID Controller or optional RAID Controller.

If your system has been factory configured, the BIOS SETUP or RAID configuration utility do not need to be run unless you want to change the password or security features, add certain types of option boards or devices, upgrade your system board, or change the RAID configuration.

This chapter also provides information on several system configuration parameters that are set by jumpers on the system board. However, these parameters do not usually require change.

SYSTEM BIOS (SETUP)

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

Make sure you understand the information in this section so you can specify the correct settings when installing the server or adding or removing an optional component.

The SETUP utility is used to change system configuration parameters. 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 with the best settings. Thus, you don't 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: Administrator and User. With the Administrator 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 that appear on your SETUP utility might therefore differ from descriptions in this manual. If you find anything unclear, see the online help or ask your service representative.

- Use the Save & Exit menu or the **Esc** or **F4** key when exiting the SETUP utility. Exiting the utility by turning off the power or resetting results in the parameters being lost.

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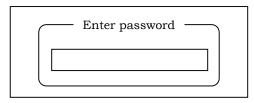
Turning on the server starts POST (Power On Self-Test) and displays its check results. If the NEC logo is displayed, press **Esc**.

After a few seconds, the following message appears at the bottom left of the screen.

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

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
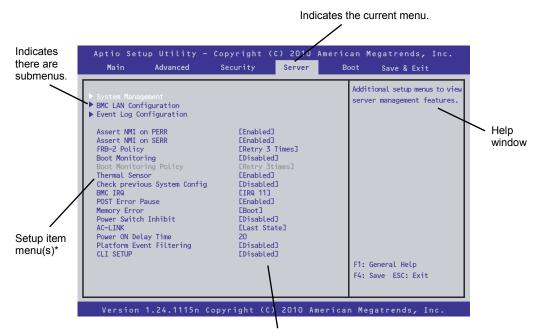
Up to three password entries will be accepted. If you fail to enter the password correctly three times in a row, the server halts. (You can no longer proceed.) Turn off the server.

> **NOTE:** The server is provided with two levels of password:
> Administrator and User. With the Administrator password, you can
> view and change all system parameters. With the User password,
> system parameters available for viewing and changing are limited.

Description on On-Screen Items and Key Usage

Use the following keyboard keys to work with the SETUP utility.

Indicates the current menu.

Indicates there are submenus.

```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
   Main        Advanced      Security     Server       Boot     Save & Exit

 ▶ System Management                                    Additional setup menus to view
 ▶ BMC LAN Configuration                                server management features.
 ▶ Event Log Configuration

   Assert NMI on PERR            [Enabled]
   Assert NMI on SERR            [Enabled]
   FRB-2 Policy                  [Retry 3 Times]
   Boot Monitoring               [Disabled]
   Boot Monitoring Policy        [Retry 3times]
   Thermal Sensor                [Enabled]
   Check previous System Config  [Disabled]
   BMC IRQ                       [IRQ 11]
   POST Error Pause              [Enabled]
   Memory Error                  [Boot]
   Power Switch Inhibit          [Disabled]
   AC-LINK                       [Last State]
   Power ON Delay Time           20
   Platform Event Filtering      [Disabled]
   CLI SETUP                     [Disabled]
                                                       F1: General Help
                                                       F4: Save  ESC: Exit

   Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

Help window

Setup item menu(s)*

Parameter (high-lights upon selection) menu

* Items displayed in gray are automatically specified or detected, cannot be changed, or can only be changed by entering a password.

Cursor (↑, ↓):	Selects an item on the screen. The highlighted item is currently selected.
Cursor (←, →):	Selects the Main, Advanced, Security, Server, Boot, or Save & Exit menu.
– and **+**:	Changes the value (parameter) of the selected item. When a submenu option (an option preceded by "➤") is selected, these keys are disabled.
Enter	Press **Enter** to select (determine) parameters.
Esc	Return to the previous screen.

Menu and Parameter Descriptions

The SETUP utility has the following six major menus:

- ■ Main
- ■ Advanced
- ■ Security
- ■ Server
- ■ Boot
- ■ Save & Exit

To specify detailed feature settings, select a submenu from the above menus. The following describes available functions and parameters, as well as the factory settings, for each menu.

Main

When you start up the setup utility, the Main menu is displayed first.

```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
   Main      Advanced      Security      Server      Boot      Save & Exit

   BIOS Information                                   Select the display language
   BIOS Version            4. 6. XXXX                 for system setup.
   Build Date              01/27/2010
   Access Level            Administrator

   Memory Information
   Total Memory            2048 MB

   System Language         [English]
   System Date             [Thu 01/15/2009]
   System Time             [20:33:57]




                                                      F1: General Help
                                                      F4: Save  ESC: Exit


     Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

The following table shows the items that can be specified on the Main menu screen and their functions.

Option	Parameters	Description
BIOS Information	–	–
BIOS Version	–	Displays the BIOS version (display only).
Build Date	MM/DD/YYYY	Displays the BIOS build date (display only).
Access Level	[Administrator] or [User]	Displays whether the setup menu is currently being accessed by an administrator or user (display only). If no password is specified, [Administrator] is displayed.
Memory Information	–	–
Total Memory	–	Displays the basic memory capacity (display only).
System Language	[English] Français Deutsch Español Italiano	Select which language BIOS displays. If you run SETUP with [BIOS Redirection Port] being enabled, [English] is selected for [System Language] forcedly. At that time, you cannot change setting of [System Language]. If [BIOS Redirection Port] is disabled, the default setting is restored at the next startup of SETUP, and you can select the language.
System Date	WWW MM/DD/YYYY	Set the system date.
System Time	HH:MM:SS	Set the system time.

[   ]: Factory-set

IMPORTANT:

Be sure to confirm that the date and time in the BIOS parameters are correctly specified. In any of the following situations, check the system time before using the server:

- After transporting the server

- After removing the server from storage

- After setting the server to "Hibernate" under any conditions for which server operation is not guaranteed (any temperature outside the range from 10 to 35°C or any humidity outside the range from 20 to 80%)
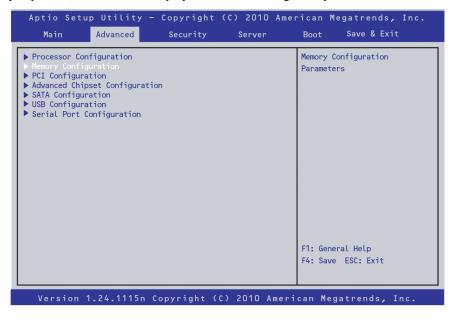
Check the system time approximately once per month. In addition, if incorporating the server into a system for which high time precision is required, it is recommended to ensure the precision by using a time server (an NTP server) or similar means.

If the system time becomes considerably slow or fast over time even though you regularly adjust it, contact the dealer where you purchased the server or the maintenance service company for maintenance.

Advanced
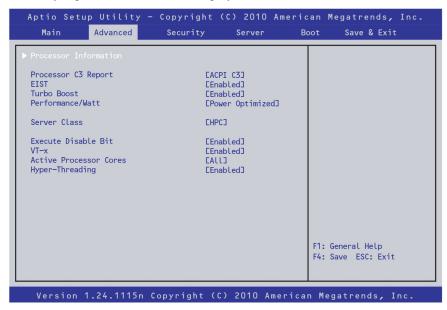
When the cursor is moved to the [Advanced] position, the Advanced menu is displayed.

If an item with an arrow displayed to its left (all menus in this section) is selected and then the **Enter** key is pressed, a submenu is displayed in which settings are specified.

```
   Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
      Main    Advanced    Security    Server    Boot    Save & Exit

   ▶ Processor Configuration            Memory Configuration
   ▶ Memory Configuration               Parameters
   ▶ PCI Configuration
   ▶ Advanced Chipset Configuration
   ▶ SATA Configuration
   ▶ USB Configuration
   ▶ Serial Port Configuration





                                        F1: General Help
                                        F4: Save  ESC: Exit


      Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

Processor Configuration submenu

When [Processor Configuration] is selected in the Advanced menu and then the **Enter** key is pressed, the screen below is displayed. If an item with an arrow displayed to its left is selected and then the **Enter** key is pressed, a submenu is displayed.

```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
   Main        Advanced      Security      Server        Boot       Save & Exit

 ▶ Processor Information

   Processor C3 Report                [ACPI C3]
   EIST                               [Enabled]
   Turbo Boost                        [Enabled]
   Performance/Watt                   [Power Optimized]

   Server Class                       [HPC]

   Execute Disable Bit                [Enabled]
   VT-x                               [Enabled]
   Active Processor Cores             [ALL]
   Hyper-Threading                    [Enabled]



                                                         F1: General Help
                                                         F4: Save  ESC: Exit


       Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

For details about the options, see the following table.

Option	Parameters	Description
Processor Information	–	–
Processor C3 Report	Disabled ACPI C2 [ACPI C3]	Specify the processor C3 state.
EIST	Disabled [Enabled]	Specify whether to enable or disable the SpeedStep feature provided by Intel processors. This setting is only displayed and can only be specified if a processor that supports the feature is installed.
Turbo Boost	Disabled [Enabled]	Specify whether to enable or disable the Turbo Boost Technology feature provided by Intel processors.
Performance/Watt	Traditional [Power Optimized]	Specify the optimization setting for the Turbo Boost feature.
Server Class	Enterprise [HPC] Custom	Select the performance level of processor. Enterprise: Specify when using the server with less power consumption. HPC: Specify when using the server with high performance. Custom: Specify when providing setting individually.

Option	Parameters	Description
Hardware Prefetcher	Disabled [Enabled]	Specify whether to enable or disable the Hardware Prefetcher of the processor. This menu appears and becomes accessible when [Custom] is specified for [Server Class].
Adjacent Cache Line Prefetch	Disabled [Enabled]	Specify whether to enable or disable the optimal access to the cache line from the memory. This menu appears and becomes accessible when [Custom] is specified for [Server Class].
L1 Data Prefetcher	Disabled [Enabled]	Specify whether to enable or disable the prefetcher of the L1 data. This menu appears and becomes accessible when [Custom] is specified for [Server Class].
Data Reuse Optimization	Disabled [Enabled]	Specify whether to enable or disable the optimal reuse of data. This menu appears and becomes accessible when [Custom] is selected for [Server Class].
Execute Disable Bit	Disabled [Enabled]	This is only displayed for a processor that supports the Execute Disable Bit feature. Specify whether to use this feature.
VT-x	Disabled [Enabled]	Specify whether to enable or disable the virtualization technology features provided by Intel processors.
Active Processor Cores	[All] 1 2 3 4 5	Specify how many active cores are in the processor. The number of optional cores differs depending on the installed processor.
Hyper-Threading	Disabled [Enabled]	This feature is used to show one physical CPU as two logical CPUs. This setting is only displayed and can only be specified if a processor that supports the feature is installed.

[   ]: Factory-set

Processor Information submenu

```
Aptio Setup Utility — Copyright (C) 2010 American Megatrends, Inc.
   Main      Advanced      Security      Server      Boot      Save & Exit

   Processor 1 CPUID              106a4
   Processor Type                Intel (R) Xeon(R) CPU
   Processor Speed               2261 MHz
   Processor Cores               Quad
   L2 Cache RAM                  1024 KB
   L3 Cache RAM                  9192 KB
   Microcode Revision            xxxx xxxx
   EMT64                         Supported
   Hyper-Threading               Supported

   Processor 2 CPUID             106a4
   Processor Type                Intel (R) Xeon(R) CPU
   Processor Speed               2261 MHz
   Processor Cores               Quad
   L2 Cache RAM                  1024 KB
   L3 Cache RAM                  9192 KB
   Microcode Revision            xxxx xxxx
   EMT64                         Supported
   Hyper-Threading               Supported

                                 Not Installed         F1: General Help
                                                       F4: Save  ESC: Exit



   Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

For details about the options, see the following table (display only).

Option	Parameters	Description
Processor 1 CPUID	A number Not Installed	If a number is displayed, it is the processor 1 ID. [Not Installed] indicates that processor 1 is not installed.
Processor Type	–	Displays the processor 1 type.
Processor Speed	–	Displays the processor 1 clock speed.
Processor Cores	–	Displays the number of internal processor 1 cores.
L2 Cache RAM	–	Displays the secondary cache size for processor 1.
L3 Cache RAM	–	Displays the tertiary cache size for processor 1.
Microcode Revision	–	Displays the revision of the microcode applied to processor 1.
EMT64	Supported	Displays whether processor 1 supports the Intel 64 architecture.
Hyper-Threading	Supported	Displays whether processor 1 supports Hyper-Threading features.
Processor 2 CPUID	A number Not Installed	If a number is displayed, it is the processor 2 ID. [Not Installed] indicates that processor 2 is not installed.
Processor Type	–	Displays the processor 2 type.
Processor Speed	–	Displays the processor 2 clock speed.
Processor Cores	–	Displays the number of internal processor 2 cores.
L2 Cache RAM	–	Displays the secondary cache size for processor 2.
L3 Cache RAM	–	Displays the tertiary cache size for processor 2.
Microcode Revision	–	Displays the revision of the microcode applied to processor 2.
EMT64	Supported	Displays whether processor 2 supports the Intel 64 architecture.
Hyper-Threading	Supported	Displays whether processor 2 supports Hyper-Threading features.

[   ]: Factory-set

Memory Configuration submenu
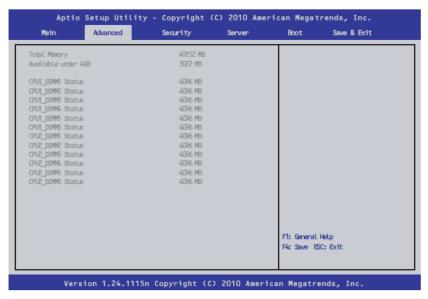
When [Memory Configuration] is selected in the Advanced menu and then the **Enter** key is pressed, the screen below is displayed. If an item with an arrow displayed to its left is selected and then the **Enter** key is pressed, a submenu is displayed.

```
     Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
        Main       Advanced      Security      Server      Boot      Save & Exit

     ▶ Memory Information

       Hardware Memory Test          [Disabled]
       Memory Retest                 [No]
       Memory RAS Mode               [Independent]
       Memory Frequency              [1333 MHz]
       Memory Voltage                [Low]
       NUMA                          [Enabled]




                                                        F1: General Help
                                                        F4: Save   ESC: Exit


     Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

For details about the options, see the following table.

Option	Parameters	Description
Memory Information	–	–
Hardware Memory Test	[Disabled] Enabled	Specify whether to perform a memory test. Specifying Enable increases the POST startup time.
Memory Retest	[No] Yes	Specify whether to clear the memory error information and test all DIMMs on the next startup. After the next startup, this option is automatically switched to [No].
Memory RAS Mode	[Independent] Mirroring Lock Step Sparing	Specify the memory RAS mode. For details about this feature. See Chapter 9 for details.
Memory Frequency	Auto 800MHz 1066MHz 1333MHz	Specify the memory clock frequency.
Memory Voltage	Normal [Low]	Specify the voltage at which the memory operates. Selecting Normal increases power consumption, but the memory operation clock speeds up.
NUMA	Disabled [Enabled]	Specify whether to enable or disable the Non-Uniform Memory Access feature (displayed only in 2-CPU configuration).

[   ]: Factory-set

Memory Information submenu


```
          Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
    Main          Advanced        Security        Server         Boot        Save & Exit

    Total Memory                      49152 MB
    Available under 4GB                3072 MB

    CPU1_DIMM1 Status                 4096 MB
    CPU1_DIMM2 Status                 4096 MB
    CPU1_DIMM3 Status                 4096 MB
    CPU1_DIMM4 Status                 4096 MB
    CPU1_DIMM5 Status                 4096 MB
    CPU1_DIMM6 Status                 4096 MB
    CPU2_DIMM1 Status                 4096 MB
    CPU2_DIMM2 Status                 4096 MB
    CPU2_DIMM3 Status                 4096 MB
    CPU2_DIMM4 Status                 4096 MB
    CPU2_DIMM5 Status                 4096 MB
    CPU2_DIMM6 Status                 4096 MB

                                                              F1: General Help
                                                              F4: Save  ESC: Exit

          Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

For details about the options, see the following table (display only).

Option	Parameters	Description
Total Memory	–	Displays the basic memory capacity.
Available under 4GB	–	Displays the amount of available memory in an area at 4GB or less.
CPU1_DIMM1-6 Status CPU2_DIMM1-6 Status	A number Disabled Not Present Error Mirrored Lock Step Spared	Displays the current memory status. A number is displayed if the memory is normal and indicates the capacity. [Disabled] indicates that the memory has failed, [Not Present] indicates that no memory is installed, and [Error] indicates forced memory startup. If Memory RAS Mode is set to Mirroring/Lock Step/Sparing, a DIMM used for these features is displayed as "Mirrored", "Lock Step", or "Spared". The displayed names and DIMM socket names are the same.

[   ]: Factory-set

PCI Configuration submenu

When [PCI Configuration] is selected in the Advanced menu and then the **Enter** key is pressed, the screen below is displayed.

```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
    Main      Advanced      Security      Server      Boot      Save & Exit

 LAN Controller                  [Enabled]           Disables / Enables the
 LAN1 Option ROM Scan            [PXE Boot]          onboard LAN controller.
 LAN2 Option ROM Scan            [PXE Boot]

 PCI Slot 0A Option ROM          [Enabled]
 PCI Slot 1B Option ROM          [Enabled]
 PCI Slot 1C Option ROM          [Enabled]




                                                     F1: General Help
                                                     F4: Save  ESC: Exit

     Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

For details about the options, see the following table.
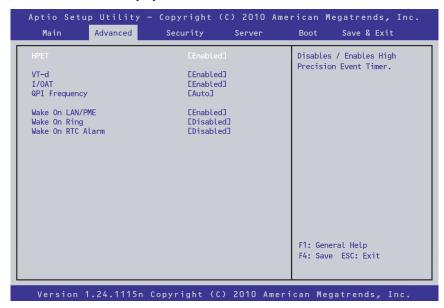
Option	Parameters	Description
LAN Controller	Disabled [Enabled]	Specify whether to enable or disable the onboard LAN Controller.
LAN1 Option ROM Scan	Disabled [PXE Boot] iSCSI Boot	Specify the boot method for LAN1, which is onboard.
LAN2 Option ROM Scan	Disabled [PXE Boot] iSCSI Boot	Specify the boot method for LAN2, which is onboard.
PCI Slot 0A Option ROM	Disabled [Enabled]	Specify whether to enable or disable an option ROM for a RAID Controller installed in a slot dedicated to RAID Controllers.
PCI Slot 1B Option ROM	Disabled [Enabled]	Specify whether to enable or disable an option ROM for a PCI card connected to the full-height riser card.
PCI Slot 1C Option ROM	Disabled [Enabled]	Specify whether to enable or disable an option ROM for a PCI card connected to the low-profile riser card.

[   ]: Factory-set

IMPORTANT: For a RAID Controller, LAN card (network boot), or Fibre Channel controller, if no hard disk drive on which an OS is installed is connected, set the option ROM for that slot to [Disabled].

Advanced Chipset Configuration submenu

When [Advanced Chipset Configuration] is selected in the Advanced menu and then the **Enter** key is pressed, the screen below is displayed.

```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
     Main      Advanced      Security      Server      Boot      Save & Exit

 HPET                          [Enabled]              Disables / Enables High
                                                      Precision Event Timer.
 VT-d                          [Enabled]
 I/OAT                         [Enabled]
 QPI Frequency                 [Auto]

 Wake On LAN/PME               [Enabled]
 Wake On Ring                  [Disabled]
 Wake On RTC Alarm             [Disabled]




                                                      F1: General Help
                                                      F4: Save  ESC: Exit


     Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

For details about the options, see the following table.
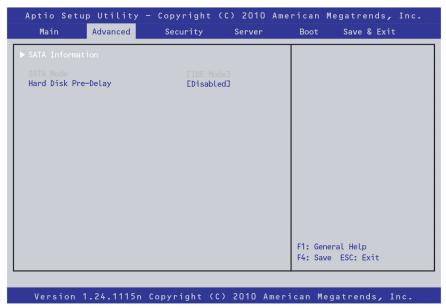
Option	Parameters	Description
HPET	Disabled [Enabled]	Specify whether to enable or disable the multimedia timer.
VT-d	Disabled [Enabled]	Specify whether to enable or disable Intel® Virtualization Technology for Directed I/O, which is provided by the Intel chipset. This setting is only displayed for a processor that supports this feature.
I/OAT	Disabled [Enabled]	Specify whether to enable or disable the Intel I/O acceleration technology feature.
QPI Frequency	[Auto] 4,800 GT/s 5,866 GT/s 6,400 GT/s	Specify the QPI bus speed.
Wake On LAN/PME	Disabled [Enabled]	Specify whether to enable or disable the feature for remotely turning the power on through a network.
Wake On Ring	[Disabled] Enabled	Specify whether to enable or disable the feature for remotely turning the power on through a serial port (modem).
Wake On RTC Alarm	[Disabled] Enabled	Specify whether to enable or disable the feature for remotely turning the power on by using the real-time clock alarm feature.

[   ]: Factory-set

IMPORTANT: If the AC power is turned off while the Wake On Ring feature is enabled, this feature is disabled at the next system boot after AC power-on. Press the power switch to start up the system. If the AC power is turned off, the Wake On Ring feature on the power management chip is disabled until the next DC power-on.

SATA Configuration submenu
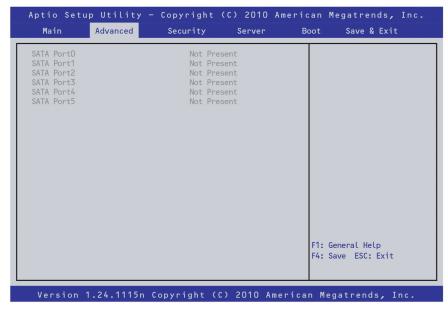
When [SATA Configuration] is selected in the Advanced menu and then the **Enter** key is pressed, the screen below is displayed. If an item with an arrow displayed to its left is selected and then the **Enter** key is pressed, a submenu is displayed.

```
  Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
    Main      Advanced     Security      Server       Boot     Save & Exit

  ▶ SATA Information

    SATA Mode                        [IDE Mode]
    Hard Disk Pre-Delay              [Disabled]




                                                    F1: General Help
                                                    F4: Save  ESC: Exit

      Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

For details about the options, see the following table.

Option	Parameters	Description
SATA Information	–	This is not displayed when SATA Mode is set to [RAID Mode].
SATA Mode	[IDE Mode] RAID Mode	Displays the SATA Mode status (display only).
Hard Disk Pre-Delay	[Disable] 3 Seconds 6 Seconds 9 Seconds 12 Seconds 15 Seconds 21 Seconds 30 Seconds	The system waits the specified time before first accessing HDD devices during the POST processing.

[   ]: Factory-set

SATA Information submenu
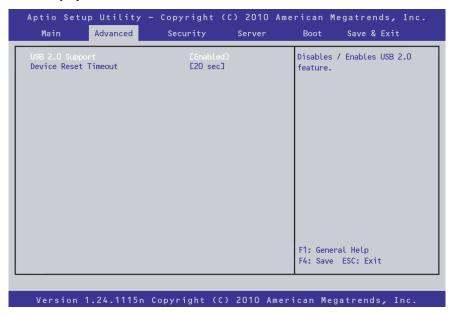
```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
   Main      Advanced      Security      Server      Boot      Save & Exit

   SATA Port0                    Not Present
   SATA Port1                    Not Present
   SATA Port2                    Not Present
   SATA Port3                    Not Present
   SATA Port4                    Not Present
   SATA Port5                    Not Present




                                                    F1: General Help
                                                    F4: Save  ESC: Exit

   Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

For details about the options, see the following table (display only).

Option	Parameters	Description
SATA Port0 SATA Port1 SATA Port2 SATA Port3 SATA Port4 SATA Port5	–	Displays the devices connected to each channel.

[   ]: Factory-set

USB Configuration submenu

When [USB Configuration] is selected in the Advanced menu and then the **Enter** key is pressed, the screen below is displayed.

```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
    Main      Advanced      Security      Server      Boot      Save & Exit

   USB 2.0 Support                [Enabled]          Disables / Enables USB 2.0
   Device Reset Timeout           [20 sec]           feature.


















                                                    F1: General Help
                                                    F4: Save  ESC: Exit


        Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

For details about the options, see the following table.

Option	Parameters	Description
USB 2.0 Support	Disabled [Enabled]	Specify whether to enable or disable USB 2.0.
Device Reset Timeout	10 sec [20 sec] 30 sec 40 sec	Specify the time to wait when issuing a Start Unit command to a USB mass storage device until a timeout occurs.

[   ]: Factory-set

Serial Port Configuration submenu

When [Serial Port Configuration] is selected in the Advanced menu and then the **Enter** key is pressed, the screen below is displayed.

```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
   Main      Advanced      Security      Server      Boot    Save & Exit

   Serial Port A Settings                              Configures serial port A using
   Serial Port A                    [Enabled]          options.
   Serial A Base I/O                [3F8h]             [Disabled]
   Serial A Interrupt               [IRQ 4]             No configuration
                                                       [Enabled]
   Serial Port B Settings                               User configuration.
   Serial Port B                    [Enabled]
   Serial B Base I/O                [2F8h]
   Serial B Interrupt               [IRQ 3]

   Console Redirection Settings
   BIOS Redirection Port            [Disabled]




                                                       F1: General Help
                                                       F4: Save  ESC: Exit


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```

For details about the options, see the following table.

Option	Parameters	Description
Serial Port A Settings	–	–
Serial Port A	Disabled [Enabled]	Specify whether to enable or disable serial port A.
Serial A Base I/O	[3F8h] 2F8h 3E8h 2E8h	Specify the base I/O address for serial port A.
Serial A Interrupt	[IRQ 4] IRQ 3	Specify the interrupt for serial port A.
Serial Port B Settings	–	–
Serial Port B	Disabled [Enabled]	Specify whether to enable or disable serial port B.
Serial B Base I/O	3F8h [2F8h] 3E8h 2E8h	Specify the base I/O address for serial port B.
Serial B Interrupt	IRQ 4 [IRQ 3]	Specify the interrupt for serial port B.
Console Redirection Settings	–	–

Option	Parameters	Description
BIOS Redirection Port	[Disabled] Serial Port A Serial Port B	Specify whether to enable or disable direct connections from the management terminal using the ESMPRO Manager or hyper terminal from the serial port specified for this menu item. If this menu item is enabled, the following setting menu items are displayed.
Terminal Type	[VT100+] VT-UTF8 ANSI	Select the terminal type.
Baud Rate	9600 19200 57600 [115200]	Specify the baud rate used for the interface with the connected hardware console.
Data Bits	7 [8]	Specify the data bit width.
Parity	[None] Even Odd	Specify the parity bits.
Stop Bits	[1] 2	Specify the stop bit setting.
Flow Control	None [Hardware RTS/CTS] Hardware RTS/CTS+CD	Specify the flow control method.
Continue C.R. after POST	Disabled [Enabled]	Specify whether to enable or disable the continued execution of console redirection after the POST finishes.

[   ]: Factory-set

Security

When the cursor is moved to the [Security] position, the Security menu is displayed.

If an item with an arrow displayed to its left is selected and then the **Enter** key is pressed, a submenu is displayed in which settings are specified.

```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
    Main      Advanced      Security      Server      Boot      Exit

  Password Configuration                                Set the Administrator Password
  Administrator Password                                for system setup.
  User Password

  Security Configuration
  Password On Boot                    [Disabled]
  Disable USB Ports                   [Disabled]












                                                       F1: General Help
                                                       F4: Save  ESC: Exit


      Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

When the **Enter** key is pressed while Administrator Password or User Password is selected, the screen for registering or changing the password is displayed.

Specify your password here.

IMPORTANT:

- A user password can be set only if an administrator password is already set.

- Set the passwords only after the OS is installed.

- If you forget your password, contact your service representative.

For details about the options, see the following table.
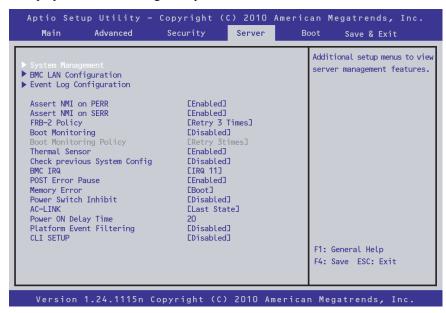
Security settings can be specified in the submenu that opens by selecting [Security Configuration] and pressing **Enter**.

Option	Parameter	Description
Password Configuration	–	–
Administrator Password	Up to 20 alphanumeric characters	When the **Enter** key is pressed, the administrator password entry screen is displayed. This password can be used to access all setup menus. This setting can only be specified by logging in as an administrator when starting up the setup utility.
User Password	Up to 20 alphanumeric characters	When the **Enter** key is pressed, the user password entry screen is displayed. This password can only be used to access certain setup menus. This setting can only be specified by logging in as an administrator when starting up the setup utility.
Security Configuration	–	–
Password On Boot	[Disabled] Enabled	Specify whether to enable or disable password entry on boot. An administrator password must be specified in advance. If an administrator password is specified and this option is set to [Disabled], BIOS is judged to have been started up by a normal user.
Disable USB Ports	[Disabled] Front Rear Internal Front + Rear Front + Internal Rear + Internal Front + Rear + Internal	Specify whether to enable or disable the USB ports.

[   ]: Factory-set

Server

When the cursor is moved to the [Server] position, the Server menu is displayed. If an item with an arrow displayed to its left (all menus in this section) is selected and then the **Enter** key is pressed, a submenu is displayed in which settings are specified.

```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
     Main       Advanced      Security      Server      Boot      Save & Exit

▶ System Management                                    Additional setup menus to view
▶ BMC LAN Configuration                                server management features.
▶ Event Log Configuration

  Assert NMI on PERR              [Enabled]
  Assert NMI on SERR              [Enabled]
  FRB-2 Policy                    [Retry 3 Times]
  Boot Monitoring                 [Disabled]
  Boot Monitoring Policy          [Retry 3times]
  Thermal Sensor                  [Enabled]
  Check previous System Config    [Disabled]
  BMC IRQ                         [IRQ 11]
  POST Error Pause                [Enabled]
  Memory Error                    [Boot]
  Power Switch Inhibit            [Disabled]
  AC-LINK                         [Last State]
  Power ON Delay Time             20
  Platform Event Filtering        [Disabled]
  CLI SETUP                       [Disabled]
                                                       F1: General Help
                                                       F4: Save  ESC: Exit

     Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

This section describes the options that can be specified on the Server menu and their functions. If [System Management], [BMC LAN Configuration], or [Event Log Configuration] is selected and then the **Enter** key is pressed, a submenu is displayed in which settings are specified.

For details about the options, see the following table.

Option	Parameters	Description
System Management	–	–
BMC LAN Configuration	–	–
Event Log Configuration	–	–
Assert NMI on PERR	Disabled [Enabled]	Specify whether to support PCI PERR.
Assert NMI on SERR	Disabled [Enabled]	Specify whether to support PCI SERR.
FRB-2 Policy	[Retry 3 Times] Disable FRB2 Timer Always Reset	Specify the system operation when an FRB level 2 error occurs.
Boot Monitoring	[Disabled] 5 to 60 minutes	Specify whether to enable or disable the boot monitoring function on booting, or select the timeout time limit. To use this function, install NEC ESMPRO Agent. Set this item to [Disabled] if the system is booted from an OS without NEC ESMPRO Agent installed.

Option	Parameters	Description
Boot Monitoring Policy	[Retry 3 Times] Always Reset	Specify the processing when a timeout occurs during boot monitoring. This option can only be specified if [Boot Monitoring] is specified. If [Retry 3 times] is selected, the system is reset after the occurrence of a timeout and booting up the OS is retried up to three times. If [Always Reset] is selected, the system is reset after the occurrence of a timeout and booting up the OS is retried repeatedly.
Thermal Sensor	Disabled [Enabled]	Specify whether to enable or disable the thermal sensor monitoring function. If a thermal error is detected with this item set to [Enabled], the system stops at the end of POST.
Check previous System Config	[Disabled] Enabled	If the system configuration has been changed since the previous startup, the system waits for user intervention before booting the system.
BMC IRQ	[IRQ 11] Disabled	Determines routing of the BMC interrupt.
Post Error Pause	Disabled [Enabled]	Specify whether to stop the POST once at the end of POST if an error occurs during the POST.
Memory Error	Halt [Boot]	Specify whether to stop operation once at the end of POST processing if there is a memory resource error while executing POST processing. This setting is effective if [POST Error Pause], which is on the [Server] menu, is set to [Enabled]. Even if this option is set to [Boot], operation stops at the end of POST processing if errors occurred for all resources.
Power Switch Inhibit	[Disabled] Enabled	Specify whether to enable or disable the power switch. Note that it is not possible to disable the ability to forcibly turn off the power by holding down the switch for four seconds.
AC-LINK	Stay Off [Last State] Power On	Specify the state of power when the AC power to the server is turn off once and then on.
Power ON Delay Time	[20] - 255	Specify the power on delay time within the range between 20 and 255 seconds. The time specified is valid when "Power On" or "Last State" is specified for AC LINK.
Platform Event Filtering	[Disabled] Enabled	Specify whether to enable or disable the platform event filtering (PEF) feature.
CLI SETUP	[Disabled] Enabled	Set to [Enabled] to run the CLI SETUP (Command Line Interface SETUP Menu) instead of SETUP menu of this GUI. To use the SETUP menu of this GUI, set this item to [Disabled] on CLI SETUP menu.

[   ]: Factory-set

The table below shows the operation when the AC power to the server is turned off once and then back on, in accordance with the [AC LINK] setting.

System status before AC power off	Setting of AC LINK		
	Stay Off	Last State	Power On
Operating	Off	On	On
Aborting (DC power being off also)	Off	Off	On
Forced shutdown	Off	Off	On

* Press the power switch continuously for four seconds or longer. This forcibly turns off the power.

> **IMPORTANT:** To turn on the server from the UPS (Uninterruptible Power Supply), select [Server] - [AC LINK] - [Power On].

System Management submenu

When [System Management] is selected in the Server menu and then the **Enter** key is pressed, the screen below is displayed.

```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
     Main       Advanced      Security      Server      Boot      Save & Exit

   BIOS Version                      4.6.XXXX

   Board Part Number                 xxxx
   Board Serial Number               xxxx
   System Part Number                xxxx
   System Serial Number              xxxx
   Chassis Part Number               xxx
   Chassis Serial Number             xxx
   Onboard LAN1 MAC                  xxx
   Onboard LAN2 MAC                  xxxx
   Management LAN MAC                xxxx
   BMC Device ID                     xxxx
   BMC Device Revision               xxxx
   BMC Firmware Revision             xxxx
   SDR Revision                      xxxx
   PIA Revision                      xxxxx



                                                    F1: General Help
                                                    F4: Save   ESC: Exit



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```

For details about the options, see the following table (display only).

Option	Parameters	Description
BIOS Version	–	Displays the current BIOS version.
Board Part Number	–	Displays the part number of the motherboard.
Board Serial Number	–	Displays the serial number of the motherboard.
System Part Number	–	Displays the part number of the system.
System Serial Number	–	Displays the serial number of the system.
Chassis Part Number	–	Displays the part number of the chassis.
Chassis Serial Number	–	Displays the serial number of the chassis.
Onboard LAN1 MAC Address	–	Displays the MAC address of the onboard LAN port 1.
Onboard LAN2 MAC Address	–	Displays the MAC address of the onboard LAN port 2.)
Management LAN MAC Address	–	Displays the MAC address of the management LAN port.
BMC Device ID	–	Displays the BMC device ID.
BMC Device Revision	–	Displays the BMC device revision.
BMC Firmware Revision	–	Displays the BMC firmware revision.
SDR Revision	–	Displays the revision of the sensor data record.
PIA Revision	–	Displays the revision of the platform information area.

[   ]: Factory-set

BMC LAN Configuration submenu

When [BMC LAN Configuration] is selected in the Server menu and then the **Enter** key is pressed, the screen below is displayed.

IMPORTANT: The management-dedicated LAN connector cannot be used for a different LAN.

```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
    Main      Advanced     Security      Server      Boot     Save & Exit

  BMC Network Configuration                                Select [Enable] to share a s
  Shared BMC LAN                  [Disabled]               ystem LAN port with BMC LAN.
  LAN Connection Type             [Auto Negotiation]       If you use a management LAN
  IP Address                      192.168.1.1              port for the BMC, select
  Subnet Mask                     255.255.255.0            [Disable].
  Default Gateway                 0.0.0.0
  DHCP                            [Disabled]

  Web Interface
  HTTP                            [Disabled]
  HTTP Port Number
  HTTPS                           [Disabled]
  HTTPS Port Number

  Command Line Interface
  Telnet                          [Disabled]
  Telnet Port Number
  SSH                             [Disabled]
  SSH Port Number

▶ Clear BMC Configuration                                  F1: General Help
                                                           F4: Save  ESC: Exit



    Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

For details about the options, see the following table.

Option	Parameters	Description
BMC Network Configuration	–	–
Shared BMC LAN	[Disabled] Enabled	Set this option to [Disabled] if the management LAN port is used. If this option is set to [Enabled], it is not possible to use LAN1 as both a normal and management LAN, so the management LAN port becomes unavailable.
LAN Connection Type	[Auto Negotiation] 100Mbps Full Duplex 100Mbps Half Duplex 10Mbps Full Duplex 10Mbps Half Duplex	Specify the connection type for management LAN port.
IP Address	[192.168.1.1]	Specify an IP address for the management LAN.
Subnet Mask	[255.255.255.0]	Specify a subnet mask for the management LAN.
Default Gateway	[0.0.0.0]	Specify a default gateway for the management LAN.

Option	Parameters	Description
DHCP	[Disabled] Enabled	Set to [Enabled] to obtain an IP address from the DHCP server automatically. If you intend to specify an IP address manually, set to [Disabled].
Web Interface	–	–
HTTP	[Disabled] Enabled	Set to [Enabled] to use HTTP communication for the Web interface.
HTTP Port Number	[80]	Specify the TCP port number which the management LAN uses for HTTP communication.
HTTPS	[Disabled] Enabled	Set to [Enabled] to use HTTPS communication for the Web interface.
HTTPS Port Number	[443]	Specify the TCP port number that the management LAN uses for HTTPS communication.
Command Line Interface	–	–
Telnet	[Disabled] Enabled	Set to [Enabled] to use Telnet communication as a command line interface.
Telnet Port Number	[23]	Specify the TCP port number to be used for Telnet communication.
SSH	[Disabled] Enabled	Set to [Enabled] to use SSH communication as a command line interface.
SSH Port Number	[22]	Specify the TCP port number to be used for SSH communication.
Clear BMC Configuration	[No] Yes	Press **Enter** and select "Yes" to initialize the BMC configuration.

[   ]: Factory-set

Event Log Configuration submenu

When [Event Log Configuration] is selected in the Server menu and then the **Enter** key is pressed, the screen below is displayed. If an item with an arrow displayed to its left is selected and then the **Enter** key is pressed, a submenu is displayed.

```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
   Main      Advanced      Security      Server      Boot      Save & Exit

 ▶ System Event Log

   Auto Clear Event Logs            [Disabled]
 ▶ Clear All Event Logs




                                              F1: General Help
                                              F4: Save  ESC: Exit



   Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

For details about the options, see the following table.
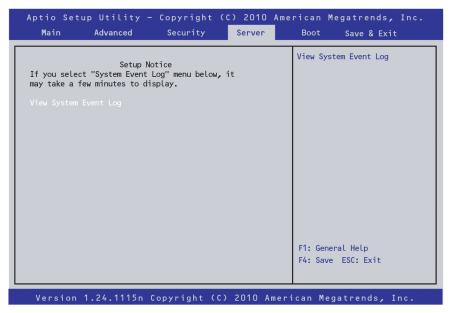
Option	Parameters	Description
System Event Log	–	System Event Log submenu is displayed.
Auto Clear Event Logs	Enabled [Disabled]	If set to "Enabled", logs are automatically cleared when the error log area becomes full.
Clear All Event Logs	[No] Yes	Press **Enter** and select "Yes" to clear the system event logs.

[   ]: Factory-set

System Event Log submenu

When [System Event Log] is selected for [Event Log Configuration] on the Server menu, the screen below is displayed.

```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
    Main      Advanced      Security      Server      Boot      Save & Exit

                         Setup Notice                    View System Event Log
        If you select "System Event Log" menu below, it
        may take a few minutes to display.

        View System Event Log




                                                         F1: General Help
                                                         F4: Save  ESC: Exit


            Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

In addition, when [View System Event Log] is selected, the screen below is displayed.

The following shows the system event log settings as an example.

The recorded system event log entries can be displayed by pressing, the up, down, **+**, **-**, **Home**, and **End** keys.

```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
    Main      Advanced      Security      Server      Boot      Save & Exit
 ► *****************************************************    View System Event Log
 ► Setup Notice :
 ►  If you select "View System Event Log"
 ► menu below, It may take a few minutes
 ► to display.
 ► *****************************************************

     Getting System Event Logs..............
     Number of SEL Entries = 919
     DATE      TIME     SENSOR TYPE
     05/28/10  18:10:19  System ACPI Power State
     05/28/10  18:10:19  System Event
     05/28/10  18:10:18  Button/Switch
     05/28/10  17:37:35  System ACPI Power State
     05/28/10  17:37:32  Reserved Type
     05/28/10  17:37:32  OS Critical Stop
     05/28/10  17:36:09  Reserved Type
     05/28/10  17:36:09  OS Boot
     05/28/10  17:35:53  System Boot Initiated
     05/28/10  17:34:28  System Event                    F1: General Help
     05/28/10  17:34:27  System Event                    F4: Save  ESC: Exit
     05/28/10  16:33:49  System Event
     05/28/10  16:33:13  System Event
     05/28/10  16:32:33  System ACPI Power State

            Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

IMPORTANT: Notes on performing Clear BMC Configuration

- Executing "Load Setup Defaults" in BIOS SETUP utility does not restore the default values for settings related to the management LAN of BMC. To restore the default values, you need to execute Clear BMC Configuration.

- It might take a few moments until initialization completes after execution of Clear BMC Configuration.

- If you are using NEC ESMPRO Agent Extension, settings for remote management feature made in NEC ESMPRO Agent Extension is also cleared by executing Clear BMC Configuration. Before execution, be sure to make backup copy of setting information for remote management feature by using NEC ESMPRO Agent Extension or "System Management" in Tool menu of NEC EXPRESSBUILDER.

NOTE: Executing [Save Custom Defaults/Load Custom Defaults] of BIOS SETUP does not save the settings you have specified in the BMC LAN Configuration menu.

Boot

When the cursor is moved to the [Boot] position, the Boot menu is displayed.

```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
     Main      Advanced      Security      Server      Boot      Save & Exit

    Boot Configuration                                          Disables/Enables the Quiet Boot
    Quiet Boot                      [Enabled]                   option
    Bootup Numlock State            [Off]
    Setup Prompt Timeout            5

    Boot Option Priorities
    Boot Option #1                  [CD/DVD Drive]
    Boot Option #2                  [Y-E DATAUSB-FDU 7.03]
    Boot Option #3                  [Hard Drive]
    Boot Option #4                  [IBA GE Slot 0100 v...]

    CD/DVD ROM Drive BBS Priorities
    Floppy Drive BBS Priorities
    Hard Drive BBS Priorities
    Network Drive BBS Priorities

                                                                F1: General Help
                                                                F4: Save  ESC: Exit

     Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

For details about the options, see the following table.

Option	Parameters	Description
Boot Configuration	–	–
Quiet Boot	Disabled [Enabled]	When this option is set to [Disabled], the results of POST execution are displayed instead of the NEC logo after the power is turned on. If [BIOS Redirection Port] is enabled, this option is shown as [Unavailable] and inaccessible. The Quiet Boot feature always disabled. If [BIOS Redirection Port] is disabled, the default setting is displayed at the next startup of SETUP, and you can change setting.
Bootup Numlock State	On [Off]	Specify whether to enable or disable the Numlock state when the system starts up.
Setup Prompt Timeout	A number	Specify the time until the **F2** is pressed to launch SETUP during POST.
Boot Option Priorities	–	–
Boot Option #1	–	These items display the priority of boot devices. If all of the Boot Options are set to [Disabled], the SETUP starts running upon completion of POST.
Boot Option #2	–	
Boot Option #3	–	
Boot Option #4	–	

Option	Parameters	Description
CD/DVD ROM Drive BBS Priorities	–	Specify the boot priority for each BBS.
Floppy Drive BBS Priorities	–	
Hard Drive BBS Priorities	–	
Network Drive BBS Priorities	–	

[   ]: Factory-set

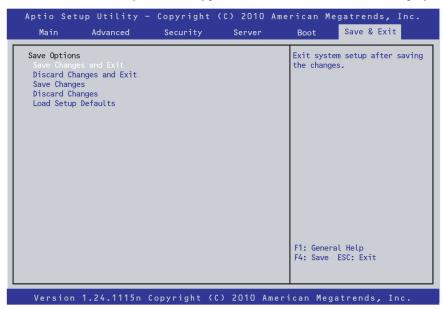**1.** When BIOS detects a bootable device, it displays the information on the device for the relevant item.

To boot the server from a desired device, the device must be registered as a boot device. (Up to eight boot devices can be registered.)

2. You can change the boot priority (first to fourth) of each device by using the ↑, ↓, **+** and **–** keys.

To change the priority of a device, move the cursor to the device by using the ↑ and ↓ keys, and then press the **+** or **–** key.

Save & Exit

When the cursor is moved to the [Save & Exit] position, the Save & Exit menu is displayed.

```
Aptio Setup Utility - Copyright (C) 2010 American Megatrends, Inc.
   Main      Advanced     Security     Server      Boot     Save & Exit

  Save Options                                      Exit system setup after saving
  Save Changes and Exit                             the changes.
  Discard Changes and Exit
  Save Changes
  Discard Changes
  Load Setup Defaults




                                                    F1: General Help
                                                    F4: Save  ESC: Exit

       Version 1.24.1115n Copyright (C) 2010 American Megatrends, Inc.
```

Each option in this menu is described below.

> **IMPORTANT:** The factory settings and default values differ
> depending on the model. The settings must be corrected according to
> your environment by referring to the list of settings in this section.

Save Changes and Exit

Select this item to save the newly selected settings in the CMOS memory (which is non-volatile)
and exit the setup utility. When [Save Changes and Exit] is selected, a confirmation screen is
displayed.
If you select [Yes] on this screen, the newly selected settings are saved to the CMOS memory, the
setup utility is closed, and the system automatically restarts.

Discard Changes and Exit

Select this item to exit the setup utility without saving the newly selected settings in the CMOS
memory (which is non-volatile).

When this item is selected, the [Reset without saving?] confirmation screen is displayed, and, if you
select [Yes], the setup utility is closed without saving the settings to the CMOS memory, and the
system proceeds to the boot processing. If you select [No], the changed settings are saved to the
CMOS memory, the setup utility is closed, and the system automatically restarts.

Save Changes

Select this item to save the newly selected settings in the CMOS memory. When [Save Changes] is selected, a confirmation screen is displayed.

If you select [Yes] on this screen, the newly selected settings are saved to the CMOS memory.

Discard Changes

Select this item to restore the settings from before the settings were changed this time before saving. When Discard Changes is selected, a confirmation screen is displayed.

If you select [Yes] on this screen, the newly selected settings are discarded, and the previous settings are restored.

Load Setup Defaults

Select this item to restore the default values for all setup utility settings. When Load Setup Defaults is selected, a confirmation screen is displayed.

If you select [Yes] on this screen, the default values for all setup utility settings are restored, and the Exit menu is redisplayed. If you select [No], the Exit menu is redisplayed.

RAID SYSTEM CONFIGURATION

This section describes how to use the internal hard disk drives as RAID System by Onboard RAID Controller (LSI Embedded MegaRAID™).

About the optional RAID Controller (N8103-129/130), refer to the documents provided with optional RAID Controller.

RAID

Overview of RAID System

What is RAID (Redundant Array of Inexpensive Disks)?

RAID is an abbreviation for "Redundant Array of Inexpensive Disks". The RAID technology allows more than one hard disk drive to be handled collectively.

In actual, RAID can configure more than one hard disk drives as a single array (disk group) to operate the hard disk drives effectively. This can bring higher performance than a single hard disk drive of a large capacity.

The Onboard RAID Controller (LSI Embedded MegaRAID™) or optional RAID Controller has a feature to divide a single disk group into several logical drives (virtual disks). The RAID Controller recognizes these virtual disks as if it were a single hard disk drive. The RAID Controller accesses to more than one hard disk drive configuring a disk group in parallel.

Some RAID levels can recover data from remaining data and parity by using rebuild feature if an error occurs in a single hard disk drive. This can provide high reliability for the system.

RAID Levels

The record mode enabling the RAID feature includes several levels. Among the levels, the Onboard RAID Controller (LSI Embedded MegaRAID™) supports RAID levels 0, 1, and 10. The Optional RAID Controller supports RAID levels 0, 1, 5, 6, 10, and 50. The number of hard disk drives required to create a disk group varies depending on the RAID level as shown in the table below.

RAID level	Number of required hard disk drives	
	Min.	Max.
RAID 0	1	6
RAID 1	2	2
RAID 10	4	6

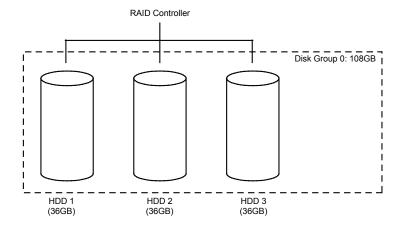* To configure RAID6 using Express Setup, at least four hard disk drives of same capacity must be installed.

IMPORTANT: The supported RAID level depends on the RAID Controller. Choose a RAID Controller appropriate to RAID system you are configuring.

NOTE: For details of the RAID levels, see "RAID Levels" described later in this chapter.

Disk Group

A disk group is configured with more than one hard disk drives.
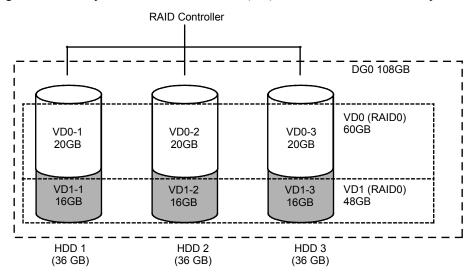The allowable number of disk groups is equal to the number of hard disk drives.

The figure below shows a sample configuration. The three hard disk drives are connected to the Onboard RAID Controller (LSI Embedded MegaRAID™) or Optional RAID Controller, creating one disk group (DG).

RAID Controller

Disk Group 0: 108GB

HDD 1 (36GB)   HDD 2 (36GB)   HDD 3 (36GB)

Virtual Disk

Virtual disk is a logical drive defined in disk group. It is recognized as a physical drive by OS. The allowable number of virtual disks is up to 16 per disk group, or up to 64 per controller.

The figure below shows a sample configuration in which the Onboard RAID Controller (LSI Embedded MegaRAID™) or Optional RAID Controller is connected with three hard disk drives, creating one Disk Group. Two RAID0 virtual disks (VD) are defined in the Disk Group.

RAID Controller

DG0 108GB

| VD0-1 20GB | VD0-2 20GB | VD0-3 20GB | VD0 (RAID0) 60GB |
| VD1-1 16GB | VD1-2 16GB | VD1-3 16GB | VD1 (RAID0) 48GB |

HDD 1 (36 GB)   HDD 2 (36 GB)   HDD 3 (36 GB)

Parity

The parity means redundant data. A single set of redundant data is created from the data saved in more than one hard disk drive.

The created redundant data is used for data recovery when a hard disk drive is defected.

Hot-Swap

The hot-swap enables a hard disk drive to be removed (or replaced) under system operation.

Hot-Spare

The hot-spare is prepared as an auxiliary hard disk drive substituting for a defected hard disk drive included in a logical drive which is configured at a redundant RAID level. Detecting a hard disk drive fault, the system disconnects the hard disk drive (or makes it offline) and starts rebuild using the hot-spare.

RAID Levels

Characteristics of RAID Levels

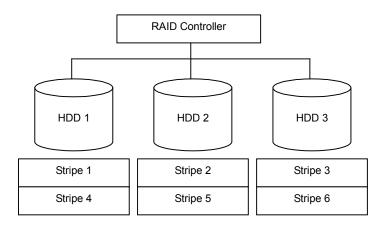The table below lists the characteristics of the RAID levels.

Level	Function	Redundancy	Characteristics
RAID0	Striping	No	• Data read/write at the highest rate • Largest capacity • Capacity: (capacity of single hard disk drive) × (number of hard disk drives)
RAID1	Mirroring	Yes	• Two hard disk drives required • Capacity: capacity of single hard disk drive
RAID10	Striping of RAID1	Yes	• Four or more hard disk drives required • Capacity: (capacity of single hard disk drive) × ((number of hard disk drives) - 2)

RAID0

In RAID0, data to be recorded is distributed to hard disk drives. The mode is called "striping".

In the figure below, data is recorded in stripe 1 (disk 1), stripe 2 (disk 2), and stripe 3 (disk 3)… in the order. Because RAID0 allows all hard disk drives to be accessed collectively, it can provide the best disk access performance.
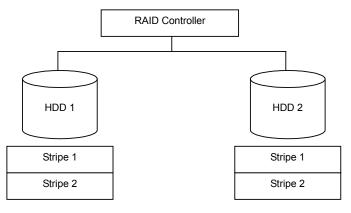
> **IMPORTANT:** RAID0 cannot have data redundancy. If a hard disk drive is defected, the data saved in the hard disk drive cannot be recovered.
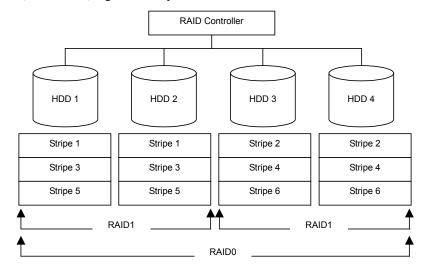

RAID1

In the RAID1 level, data saved in a hard disk drive is written to another hard disk drive without change. The mode is called "mirroring".

When data is written onto a single hard disk drive, the same data is written onto another hard disk drive. If either of the hard disk drives is defected, the other hard disk drive containing the same data can substitute for the defected hard disk drive. Thus the system can continue to operate without interruption.

RAID10

Data to be recorded is distributed to two hard disk drives in mirroring mode. Then, each mirrored data is written onto hard disk drive by striping. Owing to this feature, high disk access performance of RAID0 and, in addition, high reliability of RAID1 can be achieved.

Configuration by Onboard RAID Controller

This section describes how to use the internal hard disk drives as a RAID system by using the onboard RAID Controller (LSI Embedded MegaRAID^{TM}).

Installing the Hard Disk Drives

Install the two or more SAS hard disk drives to your server. See "Hard Disk Drive" (on page 9-7) for details.

> **IMPORTANT:** Use two hard disk drives that have the same rotation speed. In addition, use two hard disk drives of the same capacity if you are going to configure RAID1.

Enabling RAID Feature

To configure a hard disk drive as a RAID system, change the BIOS setting or the RAID system configuration jumper switch on the motherboard.

> **NOTE:** The RAID system is factory-set to "Disabled".

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-4 to 1-12 for details.

- Do not disassemble, repair, or alter the server.
- Do not remove the lithium battery.
- Do not handle the server while it is plugged in.
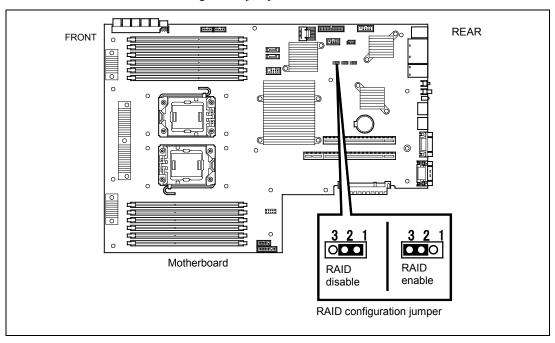

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-4 to 1-12 for details.

- Do not lift the server by yourself.
- Make sure to complete board installation.
- Do not leave the covers off.
- Be careful not to get your fingers pinched.
- Note that the server and components get hot.
- Do not pull a server out of the rack if the rack is unstable.
- Do not leave more than one server pulled out of the rack.

1. See page 9-4 to prepare.

2. Pull the server out of the rack (as described on page 9-4).

3. Remove the top cover (as described on page 9-24).

4. Remove the riser card (as described on page 9-51).

5. Locate the RAID configuration jumper on the motherboard as shown below.

6. Remove the jumper from position 2 – 3 on the jumper block.

7. Reinstall the jumper on position 1 – 2 on the jumper block.

8. Reinstall the server removed in Step 2.

9. Plug the power cord into your server and turn on the server.

10. Run the BIOS SETUP utility described earlier in the chapter.

11. Choose the Peripheral Configuration submenu in the Advanced menu.
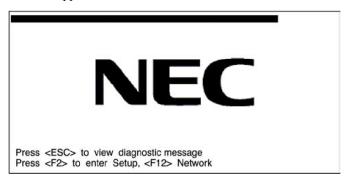
12. Change the options as follows.

    SATA Controller Mode Option: Enhanced

    SATA RAID: Enabled
    (For details, see page 4-8.)

13. Save and exit the BIOS SETUP utility

Running LSI Software RAID Configuration Utility

1. When the following screen appears after you have powered on the server, press **Esc**.

    The POST screen appears.
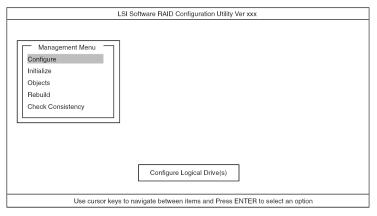

2. Check the description as shown below on the POST screen, then press **Ctrl** + **M**.

    ```
    LSI SoftwareRAID BIOS Version xxxxxx
    LSI MPT RAID Found at PCI Bus No:xx Bev No:xx
    Scanning for port 00 Responding xxxxxxxx xxxxMB
     Standard FW xxx DRAM=128MB(SDRAM)
    xx Logical drive(s) Configured
    Press <Ctrl><M> to Run LSI Software RAID Configuration Utility
    ```

    LSI Software RAID Configuration Utility starts.

    If you fail to press **Ctrl** + **M** and the system proceeds without displaying the following
    menu screen, restart the system, and press **Ctrl** + **M** on POST screen.

    LSI Software RAID Configuration Utility TOP Menu (Management Menu)

To quit the utility, press **Esc** in the TOP menu of LSI Software RAID Configuration Utility.

When a confirmation message appears, select [Yes].

```
Please Press <Ctrl> <Alt> <Del> to REBOOT the system.
```

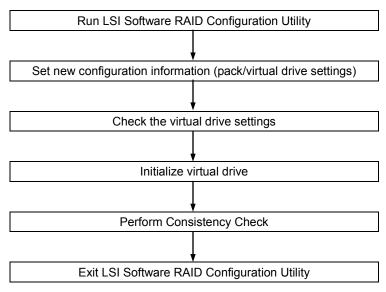When the above message appears, press **Ctrl** + **Alt** + **Delete**.

The server is rebooted.

Menu Tree

+: Selection/execution parameter ●: Setting parameter. •: Information display
>: Can be set (modified) after creation of virtual drive

Menu	Description
+Configure	Performs Configuration settings
+Easy Configuration	Set configuration (Using fixed value)
+New Configuration	Set new configuration
+View/Add Configuration	Additional setting / viewing configuration
+Clear Configuration	Clear configuration
+Select Boot Drive	Chose Bootable Virtual Drive
+Initialize	Initialize virtual drive
+Objects	Various settings
+Adapter	Set disk array controller
+Sel. Adapter	Clear configuration
●Rebuild Rate	30
●Chk Const Rate	30
●FGI Rate	30
●BGI Rate	30
●Disk WC	Off
●Read Ahead	On
●Bios State	Enable
●Cont on Error	Yes
●Fast Init	Enable
●Auto Rebuild	On
●Auto Resume	Enable
●Disk Coercion	1GB
●Factory Default	
+Virtual Drive	Virtual drive operation
+Virtual Drives	Select virtual drive (when multiple virtual drives exist)
+Initialize	Initialize virtual drive
+Check Consistency	Check virtual drive redundancy
+View/Update Parameters	Display virtual drive information
• RAID	Display RAID level
• SIZE	Display virtual drive capacity
• Stripe SIZE	Display stripe size
• #Stripes	Display the number of hard disk drives in virtual drive
• State	Display virtual drive status
• Spans	
• Disk WC	Off: Write through On: Write back
• Read Ahead	
+Physical Drive	Physical drive operation
+Physical Drive Selection Menu	Select physical drive
+Make HotSpare	Set as hot-spare disk for auto rebuilding
+Force Online	Make a disk online
+Force Offline	Make a disk offline
+Drive Properties	Display hard disk drive information
• Device Type	Hard disk drive type
• Capacity	Hard disk drive capacity
• Product ID	Hard disk drive model
• Revision No.	Hard disk drive revision
+Rebuild	Perform rebuilding
+Check Consistency	Perform virtual drive redundancy check

Operating Procedures for Configuration Utility

Creating/Adding Configuration

```
┌─────────────────────────────────────────────────────────────┐
│         Run LSI Software RAID Configuration Utility          │
└─────────────────────────────────────────────────────────────┘
                              │
                              ▼
┌─────────────────────────────────────────────────────────────┐
│  Set new configuration information (pack/virtual drive settings) │
└─────────────────────────────────────────────────────────────┘
                              │
                              ▼
┌─────────────────────────────────────────────────────────────┐
│                Check the virtual drive settings              │
└─────────────────────────────────────────────────────────────┘
                              │
                              ▼
┌─────────────────────────────────────────────────────────────┐
│                    Initialize virtual drive                  │
└─────────────────────────────────────────────────────────────┘
                              │
                              ▼
┌─────────────────────────────────────────────────────────────┐
│                  Perform Consistency Check                   │
└─────────────────────────────────────────────────────────────┘
                              │
                              ▼
┌─────────────────────────────────────────────────────────────┐
│         Exit LSI Software RAID Configuration Utility         │
└─────────────────────────────────────────────────────────────┘
```
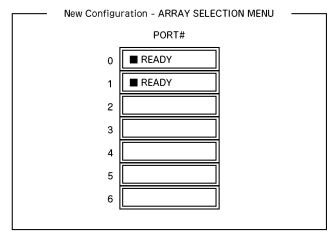
1. Run LSI Software RAID Configuration Utility.

2. Select "Configure" → "New Configuration" from the TOP menu (Management Menu).

   Select "View/add Configuration" to add configuration.

   ### IMPORTANT:

   - Creating a configuration using "New Configuration" menu clears the existing configuration information. To add configuration information to the existing configuration, select "View/add Configuration."

   - You cannot create Striping of RAID1 or set the virtual drive capacity on "Easy Configuration" menu.
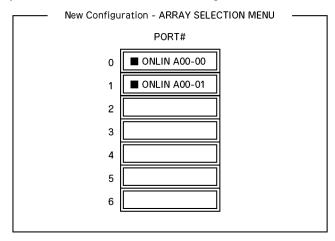   Use "New Configuration" or "View/Add Configuration" instead.

3. When a confirmation message (Proceed?) is displayed, select "Yes."

The SCAN DEVICE starts (scanning information is displayed at the bottom of the screen). Upon completion of SCAN DEVICE, the "New Configuration - ARRAY SELECTION MENU" screen appears.
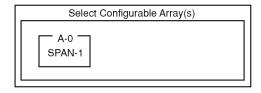
```
┌─────  New Configuration - ARRAY SELECTION MENU  ─────┐
│                                                       │
│                        PORT#                          │
│                 ┌───────────────────┐                 │
│              0  │  ■ READY          │                 │
│                 ├───────────────────┤                 │
│              1  │  ■ READY          │                 │
│                 ├───────────────────┤                 │
│              2  │                   │                 │
│                 ├───────────────────┤                 │
│              3  │                   │                 │
│                 ├───────────────────┤                 │
│              4  │                   │                 │
│                 ├───────────────────┤                 │
│              5  │                   │                 │
│                 ├───────────────────┤                 │
│              6  │                   │                 │
│                 └───────────────────┘                 │
│                                                       │
└───────────────────────────────────────────────────────┘
```

4. Move the cursor onto the hard disk drive to be packed by using cursor key and then press **Space** to select the hard disk drive.

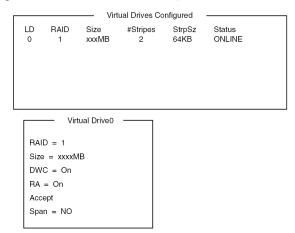The display for the selected hard disk drive changes from READY to ONLINE.

```
┌─────  New Configuration - ARRAY SELECTION MENU  ─────┐
│                                                       │
│                        PORT#                          │
│                 ┌───────────────────┐                 │
│              0  │  ■ ONLIN A00-00   │                 │
│                 ├───────────────────┤                 │
│              1  │  ■ ONLIN A00-01   │                 │
│                 ├───────────────────┤                 │
│              2  │                   │                 │
│                 ├───────────────────┤                 │
│              3  │                   │                 │
│                 ├───────────────────┤                 │
│              4  │                   │                 │
│                 ├───────────────────┤                 │
│              5  │                   │                 │
│                 ├───────────────────┤                 │
│              6  │                   │                 │
│                 └───────────────────┘                 │
│                                                       │
└───────────────────────────────────────────────────────┘
```

5. Press **F10** to set "Select Configurable Array(s)".

6. Press **Space**.

SPAN-1 is set.

```
┌────── Select Configurable Array(s) ──────┐
│                                           │
│   ┌─ A-0 ─┐                               │
│   │ SPAN-1 │                              │
│   └───────┘                               │
│                                           │
└───────────────────────────────────────────┘
```

7. Press **F10** to create virtual drive.

The "Virtual Drives Configure" screen appears. (The figure below shows an example of RAID1 configured with two hard disk drives.)

```
┌─────────────────── Virtual Drives Configured ───────────────────┐
│                                                                   │
│  LD      RAID     Size      #Stripes     StrpSz      Status       │
│  0       1        xxxMB     2            64KB        ONLINE       │
│                                                                   │
│                                                                   │
│                                                                   │
└───────────────────────────────────────────────────────────────────┘

┌─────── Virtual Drive0 ───────┐
│                               │
│  RAID = 1                     │
│  Size = xxxxMB                │
│  DWC = On                     │
│  RA = On                      │
│  Accept                       │
│  Span = NO                    │
└───────────────────────────────┘
```

8. Select "RAID," "Size", "DWC", "RA", or "Span" by using cursor keys. Then press **Enter** to fix the selection and set each value.

(1) "RAID": Sets RAID level.

Parameter	Remarks
0	RAID0
1	RAID1
10	Striping of RAID1

The selectable RAID level varies depending on the number of hard disk drives that configure a pack.

(2) "Size": Sets virtual drive size.

Up to 8 virtual drives can be created per RAID Controller.

(3) "DWC": Sets parameter for Disk Write Cache.

Parameter	Remarks
Off	Write through
On [1]	Write back

[1] Recommended setting.
"Write-back On" enables good performance, however, cache data may be lost at an unexpected power failure. "Write-back Off" reduces performance by approximately 50%.

(4) "RA": Sets parameter for Read Ahead.
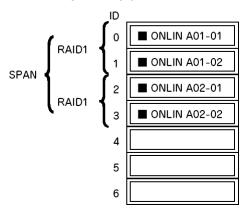
Parameter	Remarks
Off	Does not perform read ahead.
On	Performs read ahead.

(5) "Span: Sets Span.

Parameter	Remarks
SPAN=NO	Does not set span.
SPAN=YES	Sets span.

When performing SPAN, create two or more sets of the same pack at pack creation, as shown in the figure below.

STRIPING of RAID1

9. When all settings are completed, select "Accept" and then press **Enter** to create virtual drive.

The created virtual drive is displayed in the "Virtual Drive Configured" screen.

10. After creating virtual drive, press **Esc** to close the screen.

Go back to the "Save Configuration?" screen and then select "Yes" to save the configuration.

11. When the confirmation message shows that the configuration has been saved, press **Esc** to return to the TOP menu screen.

12. On the TOP menu screen, select "Objects" → "Virtual Drive" → "View/Update Parameters" to check virtual drive information.

13. Select "Initialize" in the TOP menu screen.

14. When the "Virtual Drives" screen appears, move the cursor to the virtual drive to be initialized, and press **Space**.

The virtual drive is selected.

15. After selecting virtual drive, press **F10** to start initialization.
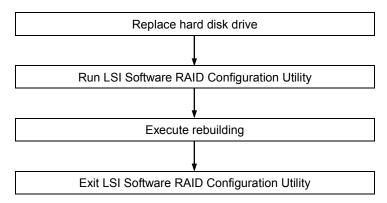
A confirmation screen for execution appears. Select "Yes" to start initialization.

When the progress bar in the "Initialize Virtual Drive Progress" screen indicates 100%, initialization is completed.

16. Execute Check Consistency on the virtual drive that has been initialized.

See "Check Consistency" for details.

17. Press **Esc** to return to the TOP menu and exit from LSI Software RAID Configuration Utility.
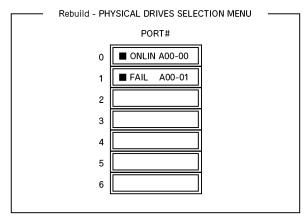
> **IMPORTANT:** Be sure to execute Check Consistency after creating configuration.

Manual Rebuild

```
┌─────────────────────────────────────────────────┐
│            Replace hard disk drive               │
└─────────────────────────────────────────────────┘
                         │
                         ▼
┌─────────────────────────────────────────────────┐
│     Run LSI Software RAID Configuration Utility  │
└─────────────────────────────────────────────────┘
                         │
                         ▼
┌─────────────────────────────────────────────────┐
│               Execute rebuilding                 │
└─────────────────────────────────────────────────┘
                         │
                         ▼
┌─────────────────────────────────────────────────┐
│    Exit LSI Software RAID Configuration Utility  │
└─────────────────────────────────────────────────┘
```

1. Replace a hard disk drive and turn on the server.

2. Run LSI Software RAID Configuration Utility.

3. Select "Rebuild" from the TOP menu.

The "Rebuild – PHYSICAL DRIVES SELECTION MENU" screen appears.

```
┌──── Rebuild - PHYSICAL DRIVES SELECTION MENU ────┐
│                                                  │
│                      PORT#                       │
│            ┌──────────────────────┐              │
│        0   │ ■ ONLIN A00-00       │              │
│            └──────────────────────┘              │
│            ┌──────────────────────┐              │
│        1   │ ■ FAIL    A00-01     │              │
│            └──────────────────────┘              │
│            ┌──────────────────────┐              │
│        2   │                      │              │
│            └──────────────────────┘              │
│            ┌──────────────────────┐              │
│        3   │                      │              │
│            └──────────────────────┘              │
│            ┌──────────────────────┐              │
│        4   │                      │              │
│            └──────────────────────┘              │
│            ┌──────────────────────┐              │
│        5   │                      │              │
│            └──────────────────────┘              │
│            ┌──────────────────────┐              │
│        6   │                      │              │
│            └──────────────────────┘              │
│                                                  │
└──────────────────────────────────────────────────┘
```

4. Move the cursor onto the hard disk drive displaying "FAIL," and then press **Space** to select it. Multiple hard disk drives can be selected (simultaneous rebuilding.)

The "FAIL" indication for the hard disk drive selected starts blinking.
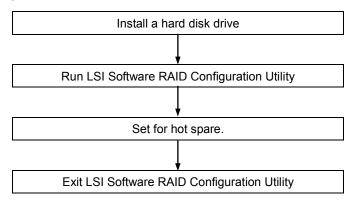
5. When hard disk drive has been selected, press **F10** to start rebuilding.

6. When confirmation screen for execution appears. Select "Yes".

The rebuild process starts.
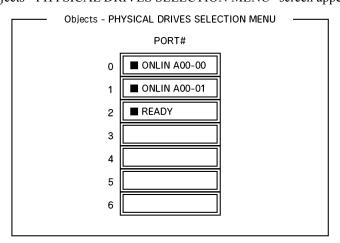
When the progress bar in the "Rebuild Physical Drives in Progress" screen indicates 100%, rebuilding is completed.

7. Press **Esc** to return to the TOP menu and exit LSI Software RAID Configuration Utility.

Setting Hot Spare

```
┌─────────────────────────────────────────────┐
│           Install a hard disk drive          │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│   Run LSI Software RAID Configuration Utility│
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│              Set for hot spare.              │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────────┐
│  Exit LSI Software RAID Configuration Utility│
└─────────────────────────────────────────────┘
```
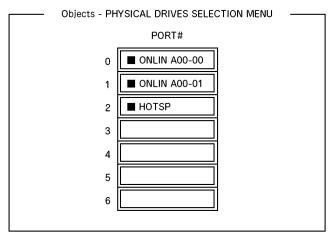
1.   Install a hard disk drive to be used as hot spare, and then turn on the server.

2.   Run LSI Software RAID Configuration Utility.

3.   Select "Objects" → "Physical Drive" from the TOP menu.

The "Objects - PHYSICAL DRIVES SELECTION MENU" screen appears.

```
┌──────── Objects - PHYSICAL DRIVES SELECTION MENU ────────┐
│                                                          │
│                         PORT#                            │
│             ┌──────────────────────┐                     │
│          0  │ ■ ONLIN A00-00       │                     │
│             ├──────────────────────┤                     │
│          1  │ ■ ONLIN A00-01       │                     │
│             ├──────────────────────┤                     │
│          2  │ ■ READY              │                     │
│             ├──────────────────────┤                     │
│          3  │                      │                     │
│             ├──────────────────────┤                     │
│          4  │                      │                     │
│             ├──────────────────────┤                     │
│          5  │                      │                     │
│             ├──────────────────────┤                     │
│          6  │                      │                     │
│             └──────────────────────┘                     │
│                                                          │
└──────────────────────────────────────────────────────────┘
```

4.   Move the cursor onto the hard disk drive to be used as hot spare and press **Enter**.

5.   The "Port #X" screen appears. Select "Make HotSpare."

6.   A confirmation screen appears. Select "Yes."

The hard disk drive indication is changed to "HOTSP."
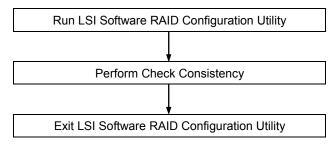
7. Press **Esc** to return to the TOP menu and exit LSI Software RAID Configuration Utility.

```
┌──── Objects - PHYSICAL DRIVES SELECTION MENU ────┐
│                                                  │
│                      PORT#                       │
│         ┌──────────────────────┐                 │
│      0  │ ■ ONLIN A00-00        │                │
│         └──────────────────────┘                 │
│         ┌──────────────────────┐                 │
│      1  │ ■ ONLIN A00-01        │                │
│         └──────────────────────┘                 │
│         ┌──────────────────────┐                 │
│      2  │ ■ HOTSP               │                │
│         └──────────────────────┘                 │
│         ┌──────────────────────┐                 │
│      3  │                      │                 │
│         └──────────────────────┘                 │
│         ┌──────────────────────┐                 │
│      4  │                      │                 │
│         └──────────────────────┘                 │
│         ┌──────────────────────┐                 │
│      5  │                      │                 │
│         └──────────────────────┘                 │
│         ┌──────────────────────┐                 │
│      6  │                      │                 │
│         └──────────────────────┘                 │
│                                                  │
└──────────────────────────────────────────────────┘
```

IMPORTANT:

■ Select "Objects" → "Physical Drive" → "Port #X" → "Force Offline" to cancel the hot spare setting.

■ When two or more hard disk drives (of the same capacity) are assigned as hot spare, rebuilding is performed in order starting from the one with the smaller CH number/ID number.

Check Consistency

```
┌─────────────────────────────────────────────────────────┐
│       Run LSI Software RAID Configuration Utility         │
└─────────────────────────────────────────────────────────┘
                            │
                            ▼
┌─────────────────────────────────────────────────────────┐
│              Perform Check Consistency                    │
└─────────────────────────────────────────────────────────┘
                            │
                            ▼
┌─────────────────────────────────────────────────────────┐
│       Exit LSI Software RAID Configuration Utility        │
└─────────────────────────────────────────────────────────┘
```

1. Run LSI Software RAID Configuration Utility.

2. Select "Check Consistency" from the TOP menu.

The "Virtual Drives" screen appears.

3. Move the cursor onto the virtual drive to be checked, and press **Space** to select it.

4. When virtual drive has been selected, press **F10** to start consistency check.

5. A confirmation screen for execution appears. Select "Yes".

The consistency check starts.

When the progress bar in the "Check Consistency Progress" screen indicates 100%, the consistency check is completed.

6. Press **Esc** to return to the TOP menu and exit LSI Software RAID Configuration Utility.

> **IMPORTANT:** Be sure to execute Check Consistency after creating configuration.

Others

■ Clear Configuration

Clears configuration information. Select "Configure" → "Clear Configuration" from the TOP menu. Executing "Clear Configuration" clears all configuration information on the RAID Controller and hard disk drives. The configuration information on all channels of the RAID Controller is also cleared.

> ### NOTES:
>
> ■ When configuration information on the RAID Controller and that on the hard disk drive do not match (excluding at replacement of faulty RAID Controller), configuration mail fail if you select the configuration information on the RAID Controller. In this case, execute "Clear Configuration" to create configuration again.
>
> ■ LSI Software RAID Configuration Utility cannot delete each virtual drive. Use Universal RAID Utility instead.

■ Force Online

Puts a hard disk drive being in the FAIL status online.

Select "Objects" → "Physical Drive" → (select hard disk drive) → "Force Online" from the TOP menu.

■ Rebuild Rate

Sets the Rebuild Rate.

Select "Objects" → "Adapter" → "Sel. Adapter" → "Rebuild Rate" from the TOP menu.

Available value is between 0% and 100%. Default value (recommended) is 30%.

■ Hard disk drive information

Checks hard disk drive information.

Select "Objects" → "Physical Drive" → (select hard disk drive) → "Drive Properties" from the TOP menu.

LSI Software RAID Configuration Utility and Universal RAID Utility

You can use Universal RAID Utility for configuration, management, and monitoring of RAID System after start up operating system.

The point to keep in mind when you use Universal RAID Utility together with LSI Software RAID Configuration Utility is as follows.

Terms

LSI Software RAID Configuration Utility and Universal RAID Utility are different in term. When you use Universal RAID Utility together with LSI Software RAID Configuration Utility, please convert terms by the following list.

Term of LSI Software RAID Configuration Utility	Term of Universal RAID Utility
Adapter	RAID Controller
Virtual Drive	Logical Drive
Array	Disk Array
Physical Drive	Physical Device

Number and ID

The number to manage each component of disk array of Universal RAID Utility is different to LSI Software RAID Configuration Utility.

Adapter and RAID Controller

LSI Software RAID Configuration Utility manages Adapter by a number beginning with 0. You can see a number of Adapter where [Sel. Adapter] in [Objects] menu. Universal RAID Utility manages RAID Controller by a number beginning with 1. You can see a number of RAID Controller where [Number] in the property of RAID Controller on RAID Viewer or [RAID Controller #X] in the property of RAID Controller on raidcmd.

Also, you can see the number of Adapter managed by LSI Software RAID Configuration Utility where [ID] in the property of RAID Controller by Universal RAID Utility.

Logical Drive

LSI Software RAID Configuration Utility manages Logical Drive by a number beginning with 0. You can see a number of Logical Drive where [Logical Drives] in [Objects] menu.

Universal RAID Utility manages Logical Drive by a number beginning with 1. You can see a number of Logical Drive where [Number] in the property of Logical Drive on RAID Viewer or [RAID Controller #X Logical Drive #Y] in the property of Logical Drive on raidcmd.

Also, you can see the number of Logical Drive managed by LSI Software RAID Configuration Utility where [ID] in the property of Logical Drive by Universal RAID Utility.

Disk Array

LSI Software RAID Configuration Utility manages Disk Array by a number beginning with 0. You can see a number of Disk Array where [Axx] of [Objects - PHYSICAL DRIVE SELECTION MENU] DG X] in [Objects] menu.

Universal RAID Utility manages Disk Array by a number beginning with 1. You can see a number of Disk Array where [Disk Array] in the property of Logical Drive on RAID Viewer or [RAID Controller #X Disk Array #Y] in the property of Disk Array on raidcmd.

Physical Drive and Physical Device

LSI Software RAID Configuration Utility manages Physical Drive by ID. You can see ID of Physical Drive where [Port #] of [Objects - PHYSICAL DRIVE SELECTION MENU] DG X] in [Objects] menu.

Universal RAID Utility manages Physical Device by a number beginning with 1 and ID. The ID is same value of ID on LSI Software RAID Configuration Utility. You can see a number and ID of Physical Device where [Number] and [ID] in the property of Physical Device on RAID Viewer or [RAID Controller #X Physical Device #Y] and [ID] in the property of Physical Device on raidcmd.

Setting of Priority

LSI Software RAID Configuration Utility displays and sets Rebuild Priority and Consistency Check Priority of RAID Controller by percentage. But, Universal RAID Utility uses three levels as High/Middle/Low for them.

The setting value of LSI Software RAID Configuration Utility and the display level of Universal RAID Utility

Item	Setting value of LSI Software RAID Configuration Utility	Universal RAID Utility Level
Rebuild Priority Rebuild Rate (LSI Software RAID Configuration Utility)	15 to 100	High
	8 to 14	Middle
	0 to 7	Low
Consistency Check Priority Chk Const Rate (LSI Software RAID Configuration Utility)	15 to 100	High
	8 to 14	Middle
	0 to 7	Low

The setting level of Universal RAID Utility and the setting value

Item	Setting level of Universal RAID Utility	Setting value
Rebuild Priority Rebuild Rate (LSI Software RAID Configuration Utility)	High	90
	Middle	50
	Low	10
Consistency Check Priority Chk Const Rate (LSI Software RAID Configuration Utility)	High	90
	Middle	50
	Low	10

NOTES:

- LSI Software RAID Configuration Utility can set FGI Rate (Foreground Initialize) and BGI Rate (Background Initialize Priority). But Universal RAID Utility can't set it.

- Universal RAID Utility can set Initialization Priority, but it can't set it to the LSI Embedded MegaRAID™. Therefore, Universal RAID Utility doesn't display [Initialization Priority] in the property of RAID Controller. Also, it will fail that you change the Initialization Priority by raidcmd.
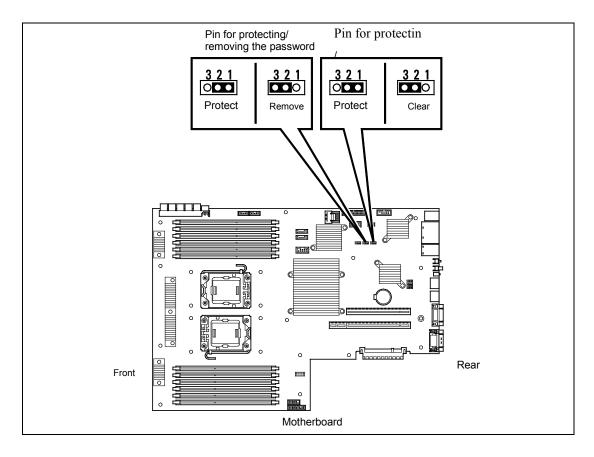
Configuring Motherboard Jumpers

With the pre-installed SETUP utility, you can set a password to protect the data stored in the server against access from unauthorized users. When you forget the password, however, you might have to remove it as described below. The procedure for clearing the CMOS data on the server is also described below.

> **IMPORTANT:**
>
> ■ Clearing the CMOS data restores the factory settings.
>
> ■ After clearing CMOS, you must run the BIOS SETUP utility and execute the following menus to reconfigure your motherboard.
>   – Load Setup Defaults in the Save & Exit menu
>   – Memory Retest of Memory Configuration in the Advanced menu
>
> ■ Do not change any other switch settings. Any change may cause the server to fail or malfunction.

To remove the password or clear the CMOS data, use the corresponding jumper switch on the motherboard of the server. The following figure illustrates the jumper switch location.

Motherboard

The following describe the clearing procedure.

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-4 to 1-12 for details.

- Do not disassemble, repair, or alter the server.
- Do not remove the lithium battery.
- Do not connect the ground line to a gas pipe.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-4 to 1-12 for details.

- Do not lift the server by yourself.
- Make sure to complete board installation.
- Do not leave the covers off.
- Be careful not to get your fingers pinched.
- Note that the server and components get hot.
- Do not pull a server out of the rack if the rack is unstable.
- Do not leave more than one server pulled out of the rack.

Clearing CMOS Memory

1. See page 9-4 to prepare.

2. Pull the server out of the rack (as described on page 9-4).

3. Remove the top cover (as described on page 9-25).

4. Locate the jumpers on the motherboard you are changing.

5. Move the jumper strap to the CMOS clear position.

   Refer to the previous illustration to find the location of the jumper.

6. Wait for a while (about 5 seconds), and then reinstall the jumper block to the default position.

7. Reinstall the server removed in Step 2.

8. Plug the power cord into your server and turn on the server.

9. Press **F2** at the prompt to run the BIOS SETUP utility, and select "Load Setup Defaults" at the Save & Exit menu.

Removing Password

1. Move the jumper switch to the password removal position in the same way as in steps 1 to 5 of "Clearing CMOS Memory".

2. Reassemble the server, and press the POWER switch to turn on the server.

3. Press **F2** during POST to run the BIOS Setup utility, set the password again, and select [Save Changes and Exit].

4. Turn off the server, and move the jumper strap to the password protect position.

5. Reassemble the server.

Chapter 5

Installing the Operating System with Express Setup

This section describes information on using Express Setup to install and configure the following operating systems to the server.

- Microsoft® Windows Server® 2008 R2 Standard / Microsoft® Windows Server® 2008 R2 Enterprise

- Microsoft® Windows Server® 2008 Standard 64-bit (x64) Edition / Microsoft® Windows Server® 2008 Enterprise 64-bit (x64) Edition

- Microsoft® Windows Server® 2008 Standard 32-bit (x86) Edition / Microsoft® Windows Server® 2008 Enterprise 32-bit (x86) Edition

- Microsoft® Windows Server® 2003 R2 Standard Edition / Microsoft® Windows Server® 2003 R2 Enterprise Edition
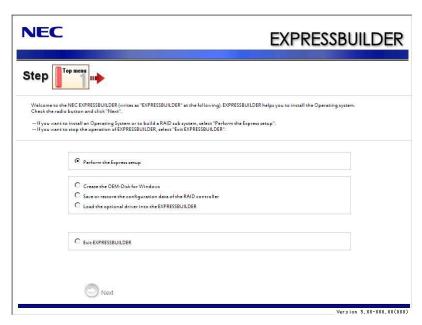
To use the server with the other operating systems described in this section, contact your service representative.

> **IMPORTANT:** Before installing the operating system, adjust the system date and time by using the BIOS setup utility "SETUP." See Chapter 4 for detail.

About Express Setup

"Express Setup" helps you to install the Windows Operating System. The setup automatically configures the RAID System and installs the Operating System and some management software.

> **IMPORTANT:** Executing the Express Setup erases all data on the hard disk drive.

You can also use "Parameter File" at "Express Setup" in order to save or backup parameters for installation.

If you want to set up the server as before, execute the Express Setup with the parameter file you have saved before.

> **NOTES:**
>
> - If you want to create a parameters file, have a blank floppy disk (MS-DOS 1.44MB format) ready.
>
> - When using a floppy disk, a USB floppy disk drive is required.
>
> - If you want to use the drivers located on the "OEM-Disk for Mass Storage Device" that ships with optional boards, a parameters file is mandatory.
>
> - You can create a parameters file in advance using "Parameter File Creator" included in NEC EXPRESSBUILDER.

Windows Server 2008 R2

This section explains how to install Windows Server 2008 R2 by using the Express Setup.

> **IMPORTANT:** The Scalable Networking Pack (SNP) function is disabled in the system that installed by Express Setup.
>
> The setting of SNP function may affect the system performance.
>
> Please contact the sales agent for more.

> **NOTE:** If you install Windows Server 2008 R2 without using Express Setup, see Appendix D.

Notes on Windows Installation

This section explains the notes on the Windows installation.

Confirm these notes before starting the Express Setup.

About the Windows Family

This computer supports the following Windows editions:

- Windows Server 2008 R2 Standard (hereinafter, referred to as "Windows Server 2008 R2")

- Windows Server 2008 R2 Enterprise (hereinafter, referred to as "Windows Server 2008 R2")

On installing other OS, contact sales dealer or the maintenance service representative.

BIOS Settings

Confirm the BIOS settings described in Chapter 4 before installing Windows Server 2008 R2.

Service Pack Which EXPRESSBUILDER Supports

The NEC EXPRESSBUILDER DVD-ROM attached to the server supports following combination of the OS installation media and Service Pack.

- Windows Server 2008 R2

    – OS installation media (No Service Pack)

Supported Mass Storage Controllers

The NEC EXPRESSBUILDER DVD-ROM attached to your system supports the following mass storage controllers for installation.

- ■ Controllers supporting installation of OS with Express Setup
  - − N8103-129 RAID Controller (256 MB, RAID 0/1)*
  - − N8103-130 RAID Controller (256 MB, RAID 0/1/5/6)*
  - − Onboard RAID Controller (LSI Embedded MegaRAID™)
- ■ Other controllers
  - − N8103-75 SCSI Controller*
  - − N8103-104A SAS Controller*
  - − N8103-107 SCSI Controller*
  - − N8190-127 Fibre Channel Controller*
  - − N8190-131 Fibre Channel Controller (2ch)*
  - − N8190-153 Fibre Channel Controller (1ch)*
  - − N8190-154 Fibre Channel Controller (2ch)*
  - * Option

About the Hardware Components

When you install the Windows Server 2008 R2, Express Setup requires several preparations if this computer uses the following hardware components.

Installing on the Mirrored Volume

When re-installing the OS to a hard disk drive which has been upgraded to Dynamic Disk, only the simple dynamic volume is available for installation.

If you want to install the OS on a volume that is mirrored using Disk Management, invalidate the mirroring and reset to the basic disk before the installation, and validate the mirroring again after the installation.

You can create, invalidate, or delete the mirror volume by using Disk Management in Computer Management.

Mounting MO Device

Do not mount an MO device on this computer during the Windows installation.

About Removable Media

Do not set removable media, such as DAT and LTO, into the device mounted on this computer during the Windows installation.

Connecting Hard Disk Drive

Do not connect the other hard disk drives except the drive that you want to create the Windows system drive.

If you create multiple logical drives in your system, see "Re-installing the Operation System if Multiple Logical Drives Exist" (5-100).

Re-installing to the Hard Disk Drive which has been upgraded to Dynamic Disk

You cannot re-install Windows Server 2008 R2 with the current partition of the hard disk drive upgraded to Dynamic Disk kept remained.

If you want to keep the current partition remained, see Appendix D to re-install the system.

Peripheral Devices such as RDX

Depending on your hardware configuration, some peripheral devices need to be removed or disabled before starting setup. Refer to the instruction manual which came with the peripheral device for pertinent information, and proceed accordingly.

About the System Partition Size

When the system is Windows Server 2008 R2

Required partition size =
size required to install OS + paging file size + dump file size + application size

Size required to install OS	= 8,000MB (Full Installation) or = 3,500MB (Server Core Installation)
Paging file size (recommended)	= Installed memory size * 1.5
Dump file size	= Installed memory size + 300MB
Application size	= Required size

IMPORTANT:

■ The above-mentioned partition size is the minimum partition size required for system installation. Ensure sufficient partition size for system operation.

Following numbers are the recommended size.

    – Full Installation: 32,768MB (32GB) or more

    – Server Core Installation: 10,240MB (10GB) or more

      *1GB = 1,024MB

■ The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the Windows Partition is required.
Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.

■ Regardless of the size of the mounted memory, or the Write debugging information (type of memory dump), the maximum size of the dump file is 'The size of the mounted memory + 300MB'.

■ If you install any application program or the like, add necessary space to the partition to install these programs.

NOTE: When new partition is created, initial 100MB is assigned as boot partition by Windows OS.

Example:

If you make a partition of 40,960MB (40GB), usable space will be 40,960MB – 100MB = 40,860MB.

Blank area

Windows Partition (40,860MB)

Boot Partition (100MB)
The boot partition is not recognized from the operating system.

The partition size required for a system with an installed memory size of 1GB (1,024MB) and a full installation of the operating system:

8,000MB + (1,024MB * 1.5) + (1,024MB + 300MB) + application size
= 10,860MB + application size.

If the provided partition size is smaller than that required to install the OS and paging file, expand the partition size or utilize a larger disk. If your system does not have a sufficient dump file size, divide the required file space into multiple disks by performing the steps below:

1. Set the system partition size to a size sufficient to install the OS and paging file.

2. See "Setting for Solving Problems" to write the debug information of the dump file onto another disk.

If there is not enough disk space to write the debug information, add another disk for the dump file.

Flow of Setup

Loading parameters (Step 2) ─── Skip

Next

Select the operating system (Step 3)

Next

RAID configuration (Step 4)

Next

Windows Confirm Setting / Input
(Steps 5 to 10)

Next

Save parameters (Step 11)

Next

Start Express Setup (Step 12)

Perform

RAID Configuration

Create the OS partition / format

Copying Windows driver
↓
Copying Selected Application

Remove the Floppy Disk and CD/DVD-ROM
from the Drive

Insert Windows DVD-ROM

Install OS Automatically

Agree Software License Agreement

Log on

The installation is completed.

[_____] : Process that needs to input or select

[_____] : Process that proceeds automatically

Installing the Windows Server 2008 R2

Express Setup proceeds the setup by selecting or inputting several parameters on the wizard. You can also save the parameters to a floppy disk as a parameters file.

1. Turn the power of peripheral device on, and then turn on the server.

2. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive of the server.

3. Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot from the NEC EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)

   The system will boot from the DVD and NEC EXPRESSBUILDER starts.

   Select "Os installation *** default ***" from the Boot selection menu.
   (If you do not hit any key, "Os installation" is selected automatically.)

   The Top menu will appear.

4. Select [English] from the Select Language, click [OK].

5. When the Software License Agreement screen of Windows PE appears, click [Yes].

6. Select [Perform the Express setup] from the Top Menu, click [Next].

7. [Load parameters] steps are displayed.

[Do not load parameters]

(1) Select [Do not load parameters].

(2) Click [Next].

> **NOTE:** If a floppy disk drive is not connected, select this item.

[Load parameters]

(1) Insert the floppy disk containing the parameters file.

> **IMPORTANT:** The setup using a parameter file saved in the Flash FDD is not supported.

(2) Select [Load parameters], enter the file path of the parameters file into the text box.

(3) Click [Next].

8. Select the installing Operating System.

Select [Install the Windows (64bit editions)] from the menu, click [Next].

9. Enter the setting of a logical drive.

[Enter RAID settings] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].

NOTES:

- You can use only the physical devices that have same model number to configure logical drive.

- If the process is not finished normally, the driver may not be stored in the EXPRESSBUILDER. Refer to "Optional Board Supported by NEC EXPRESSBUILDER" described earlier in this chapter.

10. 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].

IMPORTANT:

- About partition size

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

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

  – You can not specify a logical drive larger than 2,097,144MB at
     RAID system.

- 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, EXPRESSBUILDER installs
   the Operating System to the Windows partition (The Boot partition
   (if it exists) and the Windows partition are deleted). The data in the
   other partition is kept if the system has two or more partitions. (See
   the figure below.)

Boot Partition Deleted	Windows Partition Deleted	User Data Partition Retained

- You cannot 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".

11. Enter the user information.

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

IMPORTANT: Computer name and Administrator password that satisfy the next condition, are required.

- – More than 6 characters

- – Contains characters from three of the following categories (numbers, uppercase letters, lowercase letters, and signs).

12. Enter the setting of the network protocol.

[Enter Network Protocol] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].

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

[Enter domain account] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].

14. Select the installing components.

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

<Full Installation>

<Server Core Installation>

15. Select the installing applications.

[Select applications] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].

16. 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 files into the text box and click [Next].

If not, select [Do not save parameters].

17. The Express Setup will start when you click [Perform] in [Start Express setup] step.

18. Remove NEC EXPRESSBUILDER DVD-ROM from the optical disk drive according to the message.

If you proceed the setup by using setup parameter file, remove the floppy disk from the floppy disk drive.

19. Insert Windows Server 2008 R2 DVD-ROM into the optical disk drive.

> **NOTE:** Windows Server 2008 R2 and selected applications will be installed automatically and reboots several times.

20.   [Agree Software License Agreement] screen appears. (Full Installation only)

Read the license terms carefully. If you agree, select I accept the license terms, and then click [Start].

21.   When the following message appears, press **Ctrl** + **Alt** + **Del**.
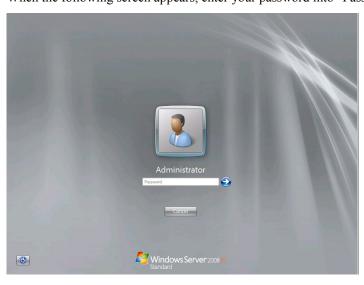
22.   Log on to the system.

<Full Installation>

When the following screen appears, enter your password into "Password", and click .

<Server Core Installation>

In the following screen, enter your password into "Password", and click ⬀.

Hereinafter, proceed operations according to the message.

Now the Setup using Express Setup has completed.

After Express Setup has completed, be sure to execute the tasks described in "Installing and Setting Device Drivers".

Installing and Setting Device Drivers

Follow these steps to install and configure the device drivers.

LAN Driver and PROSet

The LAN driver and PROSet have been installed automatically while your system was being updated in the previous section.

NOTES:

- To change the LAN driver and PROSet settings, log on to the system from a local console using an administrator account. Remotely changing the settings by using the operating system's remote desktop feature is not supported.

- [Internet Protocol (TCP/IP)] check-box is necessary checked to set an IP Addresses. According to the circumstances, the check-box is not checked from begin. Manually checked the check box and set an IP addresses.

LAN Driver Setting

> **IMPORTANT:** WOL is supported by the standard network adapters only.

■ Link Speed

LAN drivers will be installed automatically, but the link speed and Duplex mode need to be specified manually.

1.   Open the [Device Manager].

2.   Double-click [(Network Adapter Name)] in the list.

3.   Click the [Link Speed] and specify the [Speed & Duplex] value the same as the value specified for HUB.

4.   Click [OK].

5.   Restart the system.

■ WOL

Refer to the following procedure for WOL(Wake On LAN) setting.

1.   Start Device Manager.

2.   Point to [Network adapters] and double click following adapter.

Open the adapter [Properties].

[Intel(R) 82576 Gigabit Dual Port Server Network Connection]

[Intel(R) 82576 Gigabit Dual Port Server Network Connection #2]

3.   Click [Power Management] tab and change setting in [Wake On LAN] according to the following list.

Setting item	Using WOL	Not using WOL
"Wake On Magic Packet"	ON	OFF
"Wake on Magic Packet from power off state"	ON	OFF
"Wake on Link"	OFF	OFF
"Wake on Pattern Match"	OFF	OFF

> **NOTES:**
> - [Power Saver Options] setting is not necessary to change.
> - Above setting will be maintained until manually resetting are executed.

4.   Click [OK].

5.   Restart the system.

Setup Team

Adapter Fault Tolerance (AFT) is a feature that creates a group containing more than one adapter and automatically converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

Adaptive Load Balancing (ALB) is a feature that creates a group containing more than one adapter and enhances the throughput by operating packet transmission from the server by all the adapters.

This feature includes AFT feature.

Switch Fault Tolerance (SFT) is a feature that provides a failover relationship between two ports when each port is connected to a separate switch.

SFT supports two ports per team.

Static Link Aggregation (SLA) accounts for the GEC and 802.3ad static protocols.

SLA is a switch-assisted teaming mode and requires configuring ports at both ends of the link: server interfaces and switch ports.

IMPORTANT:

- AFT/ALB setup must be operated after system update and restarting the system.

- All the adapters specified as a group of Adapter Teaming must exist on the same LAN. If they are connected to the separate switches, they will not work normally.

- The adapters specified as a group of Adaptive Load Balancing (ALB) can be connected to only Switching Hub.

- When exchange the mother board or option network card, make sure to remove the adapter team before exchanges and recreate the adapter team after exchange complete.

- Confirm the port setting of switching hub (L2) matches the server network adapter Teaming mode.

- Teaming is not supported with Windows Server Core.

- If you want to change the type of a teaming, be sure to remove the teaming first, then re-setup a new teaming. Do not use the function of PROSet to change the type of a teaming.

■ **Create Team**

1. Open the [Device Manager].

2. Open [Network adapters] → [Intel(R) xxx] properties.

3. Click [Teaming] tab and check the [Team this adapter with other adapters] check box.
   Click [New Team].

4. Fill the name of the team in [Specify a name for the team] and click [Next].

5. Include the adapter to the team and click [Next].

6. Select a team mode, and then click [Next].

   > **IMPORTANT:** Following team types are supported.
   > - Adapter Fault Tolerance
   > - Adaptive Load Balancing
   > - Static Link Aggregation
   > - Switch Fault Tolerance

7. Click [Finish].

   > **IMPORTANT:** Teaming an adapter with standard network adapter and optional network adapter will cause the following message appear.
   >
   > Click [OK] and continue the setting.
   >
   > "One or more adapters in the team do not support true NDIS6.20 Receive-Side Scaling, Receive-Side Scaling will be disabled for the team, Disabling Receive-Side Scaling will negatively impact the performance of the team."

8. Click [TEAM: "Team name"] from [Device manager] → [Network adapters] to modify the team.
   Click [Settings] tab and click [Modify Team] button.

9. Refer to the following procedure to set the team member adapter priority status.

– Set Primary

Point the adapter and click [Set Primary] button.

– Set Secondary

Point the adapter and click [Set Secondary] button.

> **NOTE:** Adapter priority config can be confirmed by the following procedure:
>
> 1. Click [TEAM: "Team name"] from [Device manager]→[Network adapters].
> 2. Click [Settings] and confirm Adapters in team list.

10. Click [Test Switch] → [Run test] to confirm the adapter team is properly setup.

Confirm the result in [Test results]

11. Restart the system.

■ **Remove Team**

1. Open the [Device Manager].

2. Click [Network adapters], and open [TEAM: "Team name"] properties.

3. Click [Setting] tab.

4. Click [Remove Team] button.

5. Click [Yes] to the message.

6. Confirm [TEAM: "Team name"] adapter in not existing in [Network adapters] tree and reboot the system.

LAN Board Driver (N8104-121/122/125A/126)

The drivers for LAN Board Driver (N8104-121/122/125A/126) are automatically installed by Windows Plug-and-Play. You do not need to install them manually.

LAN Board Driver (N8104-128)

To install the driver, refer to the installation manual provided with the board and according to the installation manual, use the driver stored in attached CD-ROM.

Graphics Accelerator Driver

If you use standard graphics accelerator drivers, update your system with NEC EXPRESSBUILDER DVD-ROM attached to your system.

Standard graphics accelerator drivers will be installed automatically.

Refer to "Graphics Accelerator Driver" described in Appendix D when you want to reinstall the driver individually.

Installing SCSI Controller Driver (N8103-75/107)

If you use the SCSI Controller N8103-75/107, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing SAS Controller Driver (N8103-104A)

If you use the SAS Controller N8103-104A, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing Fibre Channel Controller Driver (N8190-127/131/153/154)

If you use the Fibre Channel Controller N8190-127/131/153/154, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Setting for Solving Problems

Setup your computer in advance so that it can recover from any trouble precisely and as soon as possible when it should occur.

For more information, refer to Page 5-88.

BitLocker

For BitLocker, hotfix is provided by Microsoft. Before applying hotfix, check the information written by Microsoft carefully.

For more information, visit http://support.microsoft.com/kb/975496/en-us.

Windows Server 2008

This section explains how to install Windows Server 2008 by using the Express Setup.

> **IMPORTANT:**
>
> - The Scalable Networking Pack (SNP) function is disabled in the system that installed by Express Setup.
>   The setting of SNP function may affect the system performance. Please contact the sales agent for more.
>
> - Refer to the public information of SNP function when KB967224 is not applied. Notes are described about KB967224.

> **NOTE:** If you install Windows Server 2008 without using Express Setup, see Appendix E.

Notes on Windows Installation

This section explains the notes on the Windows installation.

Confirm these notes before starting the Express Setup.

About the Windows Family

This computer supports the following Windows editions:

- Windows Server 2008 Standard 64-bit (x64) Edition / Windows Server 2008 Enterprise 64-bit (x64) Edition (hereinafter, referred to as "Windows Server 2008")

- Windows Server 2008 Standard 32-bit (x86) Edition / Windows Server 2008 Enterprise 32-bit (x86) Edition (hereinafter, referred to as "Windows Server 2008")

On installing other OS, contact sales dealer or the maintenance service representative.

BIOS Settings

Confirm the BIOS settings described in Chapter 4 before installing Windows Server 2008.

Service Pack Which EXPRESSBUILDER Supports

The NEC EXPRESSBUILDER DVD-ROM attached to the server supports following combination of the OS installation media and Service Pack.

- ■ Windows Server 2008
    - – OS installation media (with Service Pack 2)
    - – OS installation media (No Service Pack) + Service Pack 2
    - – OS installation media (No Service Pack)

Supported Mass Storage Controllers

The NEC EXPRESSBUILDER DVD-ROM attached to your system supports the following mass storage controllers for installation.

- ■ Controllers supporting installation of OS with Express Setup
    - – N8103-129 RAID Controller (256 MB, RAID 0/1)*
    - – N8103-130 RAID Controller (256 MB, RAID 0/1/5/6)*
    - – Onboard RAID Controller (LSI Embedded MegaRAID™)
- ■ Other controllers
    - – N8103-75 SCSI Controller*
    - – N8103-95 SCSI Controller*
    - – N8103-104A SAS Controller*
    - – N8103-107 SCSI Controller*
    - – N8190-127 Fibre Channel Controller*
    - – N8190-131 Fibre Channel Controller (2ch)*
    - – N8190-153 Fibre Channel Controller (1ch)*
    - – N8190-154 Fibre Channel Controller (2ch)*
    - * Option

About the Hardware Components

When you install the Windows Server 2008, Express Setup requires several preparations if this computer uses the following hardware components.

Installing on the Mirrored Volume

When re-installing the OS to a hard disk drive which has been upgraded to Dynamic Disk, only the simple dynamic volume is available for installation.

If you want to install the OS on a volume that is mirrored using Disk Management, invalidate the mirroring and reset to the basic disk before the installation, and validate the mirroring again after the installation.

You can create, invalidate, or delete the mirror volume by using Disk Management in Computer Management.

Mounting MO Device

Do not mount an MO device on this computer during the Windows installation.

About Removable Media

Do not set removable media, such as DAT and LTO, into the device mounted on this computer during the Windows installation.

Connecting Hard Disk Drive

Do not connect the other hard disk drives except the drive that you want to create the Windows system drive.

If you create multiple logical drives in your system, see "Re-installing the Operation System if Multiple Logical Drives Exist" (5-100).

Re-installing to the Hard Disk Drive which has been upgraded to Dynamic Disk

You cannot re-install Windows Server 2008 with the current partition of the hard disk drive upgraded to Dynamic Disk kept remained.

If you want to keep the current partition remained, see Appendix E to re-install the system.

Peripheral Devices such as RDX

Depending on your hardware configuration, some peripheral devices need to be removed or disabled before starting setup. Refer to the instruction manual which came with the peripheral device for pertinent information, and proceed accordingly.

About the System Partition Size

The system partition size can be calculated from the following formula.

When the system is Windows Server 2008 64-bit (x64) Edition:

Required partition size
= Size required to install OS + paging file size + dump file size + application size

Size required to install OS	= 11,600MB (Full Installation)
	12,300MB (Full Installation with Service Pack 2)
	16,720MB (Full Installation + Service Pack 2)
	or
	= 4,100MB (Server Core Installation)
	4,800MB (Server Core Installation with Service Pack 2)
	9,220MB (Server Core Installation + Service Pack 2)
Paging file size (recommended)	= Installed memory size * 1.5
Dump file size	= Installed memory size + 300MB
Application size	= Required size

IMPORTANT:

■ The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.

■ Regardless of the size of the mounted memory, or the Write debugging information (type of memory dump), the maximum size of the dump file is 'The size of the mounted memory + 300MB'.

■ If you install any application program or the like, add necessary space to the partition to install these programs.

Example:

The partition size required for a system with an installed memory size of 1GB (1,024MB) and a full installation of the operating system:

> 11,600MB + (1,024MB * 1.5) + (1,024MB + 300MB) + application size
> = 14,460MB + application size.

If the provided partition size is smaller than that required to install the OS and paging file, expand the partition size or utilize a larger disk.

If your system does not have a sufficient dump file size, divide the required file space into multiple disks by performing the steps below:

1. Set the system partition size to a size sufficient to install the OS and paging file.

2. See "Setting for Solving Problems" to write the debug information of the dump file on to another disk.

If there is not enough disk space to write the debug information, add another disk for the dump file.

When the system is Windows Server 2008 32-bit (x86) Edition

Required partition size
= Size required to install OS + paging file size + dump file size + application size

Size required to install OS   = 6,300MB (Full Installation)
                                  9,300MB (Full Installation with Service Pack 2)
                                  9,400MB (Full Installation + Service Pack 2)

                                  or

                                = 2,200MB (Server Core Installation)
                                  5,200MB (Server Core Installation with Service Pack 2)
                                  5,300MB (Server Core Installation + Service Pack 2)

Paging file size (recommended) = Installed memory size * 1.5
Dump file size   = Installed memory size + 300MB
Application size   = Required size

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
  Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.

- Depending on system configuration, 4096MB or more per partition might not be able to be set to the paging file size.
  Set it to 4095MB when the message to ask a value that is smaller than 4096MB is displayed.

- The maximum dump file size for the system with more than 2GB memory mounted is '2048MB + 300MB'.

- If you install any application program or the like, add necessary space to the partition to install these programs.

Example:

The partition size required for a system with an installed memory size of 1GB (1,024MB) and a full installation of the operating system:

$$6,300MB + (1,024MB * 1.5) + 1,024MB + 300MB + \text{application size}$$
$$= 9,160MB + \text{application size}.$$

If the partition where the operating system is installed is smaller than that required to install the OS and paging file, expand the partition size or utilize a larger disk. If your system does not have a sufficient dump file size, divide the required file space into multiple disks by performing the steps below:

1. Set the partition size to a size sufficient to install the OS and paging file.

2. See "Setting for Solving Problems" to write the debug information of the dump file on to another disk.

If there is not enough disk space to write the debug information, add another disk for the dump file.

Flow of Setup

NEC   EXPRESSBUILDER

Step

Loading parameters (Step 2) — Skip

Next

Select the operating system (Step 3)

Next

RAID configuration (Step 4)

Next

Windows Confirm Setting / Input (Steps 5 to 10)

Next

Save parameters (Step 11)

Next

Start Express Setup (Step 12)

Perform

RAID Configuration

Create the OS partition / format

Copying Windows driver
↓
Copying Selected Application

Remove the Floppy Disk and CD/DVD-ROM from the Drive

Insert Windows DVD-ROM

Install OS Automatically

Agree Software License Agreement

Log on

The installation is completed.

| | : Process that needs to input or select |

| | : Process that proceeds automatically |

Installing the Windows Server 2008

Express Setup proceeds the setup by selecting or inputting several parameters on the wizard. You can also save the parameters to a floppy disk as a parameters file.

    1. Turn the power of peripheral device on, and then turn on the server.

    2. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive of the server.

    3. Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot from the NEC EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)

        The system will boot from the DVD and NEC EXPRESSBUILDER starts.

        Select "Os installation *** default ***" from the Boot selection menu.
        (If you do not hit any key, "Os installation" is selected automatically.)

        The Top menu will appear.

4.   Select [English] from the Select Language, click [OK].

5.   When the Software License Agreement screen of Windows PE appears, click [Yes].

6.   Select [Perform the Express setup] from the Top Menu, click [Next].

7. [Load parameters] steps are displayed.

[Do not load parameters]

(1) Select [Do not load parameters].

(2) Click [Next].

> **NOTE:** If a floppy disk drive is not connected, select this item.

[Load parameters]

(1) Insert the floppy disk containing the parameters file.

> **IMPORTANT:** The setup using a parameter file saved in the Flash
> FDD is not supported.

(2) Select [Load parameters], enter the file path of the parameters file into the text box.

(3) Click [Next].

8. Select the installing Operating System.

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

9. Enter the setting of a logical drive.

[Enter RAID settings] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].

NOTES:

- You can use only the physical devices that have same model number to configure logical drive.

- If the process is not finished normally, the driver may not be stored in the EXPRESSBUILDER. Refer to "Optional Board Supported by NEC EXPRESSBUILDER" described earlier in this chapter.

10. 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].

IMPORTANT:

- About partition size

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

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

  – You can not specify a logical drive larger than 2,097,144MB at RAID system.

- 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, EXPRESSBUILDER installs 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 cannot 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".

11. Enter the user information.

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

IMPORTANT: Computer name and Administrator password that satisfy the next condition, are required.

– More than 6 characters

– Contains characters from three of the following categories (numbers, uppercase letters, lowercase letters, and signs).

12.   Enter the setting of the network protocol.

[Enter Network Protocol] steps are displayed. Confirm the parameters, modify if
necessary, and then click [Next].

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

[Enter domain account] steps are displayed. Confirm the parameters, modify if necessary,
and then click [Next].

14. Select the installing components.

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

<Full Installation>

<ServerCore Installation>

15. Select the installing applications.

[Select applications] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].

16. 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 files into the text box and click [Next].

If not, select [Do not save parameters].

17.   The Express Setup will start when you click [Perform] in [Start Express setup] step.

18.   Remove NEC EXPRESSBUILDER DVD-ROM from the optical disk drive according to the message.

If you proceed the setup by using setup parameter file, remove the floppy disk from the floppy disk drive.

19.   Insert Windows Server 2008 DVD-ROM into the optical disk drive.

> **NOTE:** Windows Server 2008 and selected applications will be installed automatically and reboots several times.

20.   [Agree Software License Agreement] screen appears.

Read the license terms carefully. If you agree, select I accept the license terms, and then click [Next].

21.   When the following message appears, click [Start].

22. When the following message appears, press **Ctrl** + **Alt** + **Del**.

Press CTRL + ALT + DELETE to log on

23. Log on to the system.

<Full Installation>

When the following screen appears, enter your password into "Password", and click ➔.

<Server Core Installation>

When the following screen appears, click "Other User".

In the following screen, enter "Administrator" into [UserName], your password into "Password", and click ⬅.

Hereinafter, proceed operations according to the message.

Now the Setup using Express Setup has completed.

After Express Setup has completed, be sure to execute the tasks described in "Installing and Setting Device Drivers".

Installing and Setting Device Drivers

Follow these steps to install and configure the device drivers.

LAN Driver and PROSet

The LAN driver and PROSet have been installed automatically while your system was being updated in the previous section.

> **NOTES:**
>
> - To change the LAN driver and PROSet settings, log on to the system from a local console using an administrator account. Remotely changing the settings by using the operating system's remote desktop feature is not supported.
>
> - [Internet Protocol (TCP/IP)] check-box is necessary checked to set an IP Addresses. According to the circumstances, the check-box is not checked from begin. Manually checked the check box and set an IP addresses.

Using N8104-125A Adapter after System Update

To use the N8104-125A Adapter after updating your system, you must first uninstall the LAN driver and PROSet, and then update your system with the N8104-125A Adapter connected.

■ For a server running a full installation

1. Remove a team of network adapters.

   > **NOTES:**
   >
   > - Before you remove, note down the current settings (e.g. IP addresses) of the standard and optional adapters teamed for network redundancy.
   >
   > - Configure the settings after reinstalling the LAN driver and PROSet.
   >
   > - To remove the team, see "Setup Team".

2. In [Control Panel], click [Uninstall Program].

3. Double-click [Intel(R) Network Connections 14.8.43.0].

   [Intel(R) Network Connections (Remove Options)] appears.

4. In [Remove Options], click [Remove].

   [Intel(R) Network Connections - Remove Software] appears.

5. Select [Yes].

The uninstallation starts automatically.

6. When [InstallShield Wizard Completed] appears. Click [Finish].

7. Restart the system.

■ For a server running a Server Core installation

1. Note down the current settings (e.g. IP addresses) of the standard and optional adapters teamed for network redundancy before uninstalling LAN driver.

Configure the settings after reinstalling the LAN driver.

2. At a command prompt, run dxsetup.exe in your removable medium containing the Driver Set.

　– Windows Server 2008 64-bit (x64) Editions:

　　　<drive letter>:\017\win\winnt\ws2008x64\r148\apps\prosetdx\vistax64\dxsetup.exe

　– Windows Server 2008 32-bit (x86) Editions:

　　　<drive letter>:\017\win\winnt\ws2008\r148\apps\prosetdx\vista32\dxsetup.exe

3. In [Intel(R) Network Connections - InstallShield Wizard], click [Next].

4. Select [Remove], and click [Next].

5. Click [Remove].

Uninstallation starts automatically.

6. When [InstallShield Wizard Completed] appears, click [Finish].

7. Restart the system.

LAN Driver Setting

■ Link Speed

LAN drivers will be installed   automatically, but the link speed and Duplex mode need to be specified manually.

1. Open the [Device Manager].

2. Double-click [(Network Adapter Name)] in the list.

3. Click the [Link Speed] and specify the [Speed & Duplex] value the same as the value specified for HUB.

4. Click [OK].

5. Restart the system.

■ WOL

> **IMPORTANT:** WOL is supported by the standard network adapters only.

Refer to the following procedure for WOL(Wake On LAN) setting.

1. Start Device Manager.

2. Point to [Network adapters] and double click following adapter.

    Open the adapter [Properties].

    [Intel(R) 82576 Gigabit Dual Port Server Network Connection]

    [Intel(R) 82576 Gigabit Dual Port Server Network Connection #2]

3. Click [Power Management] tab and change setting in [Wake On LAN] according to the following list.

Setting item	Using WOL	Not using WOL
"Wake On Directed Packet"	ON or OFF	OFF
"Wake On Magic Packet"	ON	OFF
"Wake on Magic Packet from power off state"	ON	OFF
"Wake on Link"	OFF	OFF

IMPORTANT: Please refer to follows about function of "Wake On Directed Packet".

ON: WOL work by DirectedPacket (*1) on hibernate or sleep state.

OFF: WOL do not work by DirectedPacket on hibernate or sleep state.

*1 The packet which includes ethernet address of adapter in Ethernet Header or the Packet including the IP address assigned by IP Header to adapter.

NOTES:

- [Power Saver Options] setting is not necessary to change.

- Above setting will be maintained until manually resetting are executed.

4. Click [OK].

5. Restart the system.

Setup Team

Adapter Fault Tolerance (AFT) is a feature that creates a group containing more than one adapter and automatically converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

Adaptive Load Balancing (ALB) is a feature that creates a group containing more than one adapter and enhances the throughput by operating packet transmission from the server by all the adapters.

This feature includes AFT feature.

Switch Fault Tolerance (SFT) is a feature that provides a failover relationship between two ports when each port is connected to a separate switch.

SFT supports two ports per team.

Static Link Aggregation (SLA) accounts for the GEC and 802.3ad static protocols. SLA is a switch-assisted teaming mode and requires configuring ports at both ends of the link: server interfaces and switch ports.

IMPORTANT:

- AFT/ALB setup must be operated after system update and restarting the system.

- All the adapters specified as a group of Adapter Teaming must exist on the same LAN. If they are connected to the separate switches, they will not work normally.

- The adapters specified as a group of Adaptive Load Balancing(ALB) can be connected to only Switching Hub.

- When exchange the mother board or option network card, make sure to remove the adapter team before exchanges and recreate the adapter team after exchange complete.

- Confirm the port setting of switching hub (L2) matches the server network adapter Teaming mode.

- Teaming is not supported with Windows Server Core.

- If you want to change the type of a teaming, be sure to remove the teaming first, then re-setup a new teaming. Do not use the function of PROSet to change the type of a teaming.

■ **Create Team**

1. Open the [Device Manager].

2. Open [Network adapters] → [Intel(R) xxx] properties.

3. Click [Teaming] tab and check the [Team this adapter with other adapters] check box.
   Click [New Team].

4. Fill the name of the team in [Specify a name for the team] and click [Next].

5. Include the adapter to the team and click [Next].

6. Select a team mode, and then click [Next].

   > **IMPORTANT:** Following team types are supported.
   >
   > - Adapter Fault Tolerance
   > - Adaptive Load Balancing
   > - Static Link Aggregation
   > - Switch Fault Tolerance

7. Click [Finish].

8. Click [TEAM: "Team name"] from [Device manager] → [Network adapters] to modify the team.
   Click [Settings] tab and click [Modify Team] button.

9. Refer to the following procedure to set the team member adapter priority status.

   – Set Primary

      Point the adapter and click [Set Primary] button.

   – Set Secondary

      Point the adapter and click [Set Secondary] button.

   > **NOTE:** Adapter priority config can be confirmed by the following procedure:
   >
   > 1. Click [TEAM: "Team name"] from [Device manager] → [Network adapters].
   > 2. Click [Settings] and confirm Adapters in team list.

10. Click [Test Switch] → [Run test] to confirm the adapter team is properly setup.
    Confirm the result in [Test results]

11. Restart the system.

■ **Remove Team**

1. Open the [Device Manager].

2. Click [Network adapters], and open [TEAM: "Team name"] properties.

3. Click [Setting] tab.

4. Click [Remove Team] button.

5. Click [Yes] to the message.

6. Confirm [TEAM: "Team name"] adapter is not existing in [Network adapters] tree and restart the system.

LAN Board Driver (N8104-112/119/120/121/122/125A/126)

The following LAN Boards are available for the N8104-112/119/120/121/122/125A/126.

To use the N8104-125A Adapter, see" Using N8104-125A Adapter after System Update" in the previous page.

The drivers for other LAN Boards are automatically installed by Windows Plug-and-Play. You do not need to install them manually.

LAN Board Driver (N8104-128)

To install the driver, refer to the installation manual provided with the board and according to the installation manual, use the driver stored in attached CD-ROM.

Graphics Accelerator Driver

If you use standard graphics accelerator drivers, update your system with NEC EXPRESSBUILDER DVD-ROM attached to your system.

Standard graphics accelerator drivers will be installed automatically.

Refer to "Graphics Accelerator Driver" described in Appendix E when you want to reinstall the driver individually.

Installing SCSI Controller Driver (N8103-75/95/107)

If you use the SCSI Controller N8103-75/95/107, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing SAS Controller Driver (N8103-104A)

If you use the SAS Controller N8103-104A, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing Fibre Channel Controller Driver (N8190-127/131/153/154)

If you use the Fibre Channel Controller N8190-127/131/153/154, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

The procedure to set PAE option

If your 32-bit system has a memory capacity in excess of 4GB, setting PAE option will enable the system to be installed with over 4GB of memory.

> **IMPORTANT:** "PAE option" is not supported on Windows Server 2008 Standard.

In Windows Server 2008 system, the PAE option can be set by using Bcdedit.exe.

The setting procedure is as follows.

1. Click [Run] on [Start] menu.

2. Type "cmd.exe" in the [Open:] box to start command prompt.

3. Execute following command line.

   bcdedit /set pae forceenable

4. Reboot the system.

   The setting mentioned above enables after reboot.

5. Execute following command line on command prompt.

   bcdedit

   Confirm "pae ForceEnable" exists in "Windows boot loader".

The setting for PAE option is now completed.

Refer following site about Bcdedit.exe.

"Boot Configuration Data Editor Frequently Asked Questions"

http://technet.microsoft.com/en-us/library/cc721886(WS.10).aspx

Setting for Solving Problems

Setup your computer in advance so that it can recover from any trouble precisely and as soon as possible when it should occur.

For more information, see Page 5-88.

Windows Server 2003

This section explains how to install Microsoft® Windows Server® 2003 by using the Express Setup.

> **NOTES:**
>
> - Express Setup does not support the installation of Windows Server 2003 x64 Editions. If you want to install it, see Appendix F.
>
> - If you install Windows Server 2003 without using Express Setup, see Appendix G.

Notes on Windows Installation

This section explains the notes on the Windows installation.

Confirm these notes before starting the Express Setup.

About the Windows family

This computer supports the following Windows editions:

- Microsoft® Windows Server® 2003 R2 Standard Edition / Microsoft® Windows Server® 2003 R2 Enterprise Edition (hereinafter, referred to as "Windows Server 2003")

> **NOTE:** Express Setup does not support the installation of Windows Server 2003 x64 Editions. If you want to install it, see Appendix F.

On installing other OS, contact sales dealer or the maintenance service representative.

BIOS Settings

Confirm the BIOS settings described in Chapter 4 before installing Windows Server 2003.

Service Pack Which EXPRESSBUILDER Supports

The NEC EXPRESSBUILDER DVD-ROM attached to the server supports following combination of the OS installation media and Service Pack.

- Windows Server 2003 R2
  - OS installation media (with Service Pack 2)
  - OS installation media (No Service Pack) + Service Pack 2
  - OS installation media (No Service Pack)

Supported Mass Storage Controllers

The NEC EXPRESSBUILDER DVD-ROM attached to your system supports the following mass storage controllers for installation.

> **NOTE:** If you want to install the other boards by using a driver floppy disk ("OEM-Disk for Mass storage device"), except ones listed below, see "Installing with the OEM-Disk for Mass storage device".

- Controllers supporting installation of OS with Express Setup
  - N8103-129 RAID Controller (256 MB, RAID 0/1)*
  - N8103-130 RAID Controller (256 MB, RAID 0/1/5/6)*
  - Onboard RAID Controller (LSI Embedded MegaRAID™)

- Other controllers
  - N8103-75 SCSI Controller*
  - N8103-95 SCSI Controller*
  - N8103-104A SAS Controller*
  - N8103-107 SCSI Controller*
  * Option

> **NOTES:**
>
> - The driver of option card mentioned above is stored in the NEC EXPRESSBUILDER DVD-ROM.
>
> - If you use the board not mentioned above, the Express Setup will fail. Refer to the instructions attached to the board.

About the Hardware Components

When you install the Windows Server 2003, Express Setup requires several preparations if this computer uses the following hardware components.

Installing on the Mirrored Volume

If you want to install the Windows Server 2003 on the volume that is mirrored using "Disk Management", invalidate the mirroring and set back to the basic disk before the installation, and validate the mirroring again after the installation.

You can create, invalidate or delete the mirror volume by using "Disk Management" in "Computer Management".

Mounting MO Device

Do not mount an MO device on this computer during the Windows installation.

About Removable Media

Do not set removable media, such as DAT and LTO, into the device mounted on this computer during the Windows installation.

Connecting Hard Disk Drive

Do not connect the other hard disk drives except the drive that you want to create the Windows system drive.

If you create multiple logical drives in your system, see "Re-installing the Operation System if Multiple Logical Drives Exist" (5-100).

Re-installing to the hard disk drive which has been upgraded to Dynamic Disk

You cannot re-install Windows Server 2003 with the current partition of the hard disk drive upgraded to Dynamic Disk kept remained.

If you want to keep the current partition remained, see Appendix G to re-install the system.

Peripheral Devices such as RDX

Depending on your hardware configuration, some peripheral devices need to be removed or disabled before starting setup. Refer to the instruction manual which came with the peripheral device for pertinent information, and proceed accordingly.

About the System Partition Size

The system partition size can be calculated from the following formula.

Required partition size
= Size necessary to install the system + Paging File Size + Dump File Size + Application Size

Size necessary to install the system	= 3500MB (Windows Server 2003 R2)
	= 3500MB (Windows Server 2003 R2 with Service Pack 2)
	= 5300MB (Windows Server 2003 R2 + Service Pack 2 CD-ROM)
Paging File Size (Recommended)	= Mounted Memory Size * 1.5
Dump File Size	= Mounted Memory Size + 12MB
Application Size	= Required Size

> **IMPORTANT:**
>
> - The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
>   Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
> - The maximum paging file size which can be set on one partition is 4095MB. If the above paging file size exceeds 4095MB, specify 4095MB for the paging file size.
> - The maximum dump file size for the system with more than 2GB memory mounted is '2048MB + 12MB'.
> - If you install any application program or the like, add necessary space to the partition to install these programs.

For example, if the mounted memory size is 1GB (1,024MB), the partition size will be calculated by the above formula as follows:

3,500MB + (1,024MB * 1.5) + (1,024MB + 12MB) + Application Size
= 6,072MB + Application Size

Dividing into the partition of the recommended size into multiple disks as written below will solve problem that it cannot be reserved in one disk.

   1.   Set the "Size required for installation + Paging file size".

   2.   See Chapter 5 and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.

   (If the disk does not have enough free space to enable the dump file size to be written, then after installing the system using the "Size required for installation + Paging file size", install an additional new disk.)

Installing the Service Pack

When installing Windows Server 2003 R2, it is not necessary to install the Service Pack 1.

FLOW OF SETUP

This section visually describes the flow of the setup operated by Express Setup.

INSTALLING Windows Server 2003

Express Setup proceeds the setup by selecting or inputting several parameters on the wizard. You can also save the parameters to a floppy disk as a parameters file.

1. Turn the power of peripheral device on, and then turn on the server.

2. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive of the server.

3. Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot from the NEC EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)

   The system will boot from the DVD-ROM and NEC EXPRESSBUILDER starts.

   Select "Os installation *** default ***" from the Boot selection menu. (If you do not hit any key, "Os installation" is selected automatically.)

   The Top menu will appear.

4. Select [English] from the [Select Language], click [OK].

5. When the Software License Agreement screen of Windows PE appears, click [Yes].

6. Select [Perform the Express setup] from the Top Menu, click [Next].

7. [Load parameters] steps are displayed.

[Do not load parameters]

(1) Select [Do not load parameters].

(2) Click [Next].

> **NOTE:** If a floppy disk drive is not connected, select this item.

[Load parameters]

(1) Insert the floppy disk containing the parameters file.

> **IMPORTANT:** The setup using a parameter file saved in the Flash FDD is not supported.

(2) Select [Load parameters], enter the file path of the parameters file into the text box.

(3) Click [Next].

8. Select the installing Operating System.

Select [Install the Windows (32bit editions)] from the menu, click [Next].

9. Enter the setting of a logical drive.

[Enter RAID settings] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].

NOTES:

- You can use only the physical devices that have same model number to configure logical drive.

- If the process is not finished normally, the driver may not be stored in the EXPRESSBUILDER. Refer to "Optional Board Supported by NEC EXPRESSBUILDER" described earlier in this chapter.

10. 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].

IMPORTANT:

- If you install Windows Server 2003 R2 and Service Pack, apply Windows Server 2003 R2 DISC 2 after Express Setup completion, and then install Service Pack by "Updating the system".

- About partition size
  - Specify the partition size larger than required minimum size for OS installation.
  - Do not specify larger partition size than the capacity of connected hard disk drive.
  - You can not specify a logical drive larger than 2,097,144MB at RAID system.

- 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, EXPRESSBUILDER installs 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 cannot 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".

11. Enter the user information and client license mode.

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

> **NOTE:** Even if you do not input value into "Administrator password", "Confirm password", "●●●●●" is displayed.

12. Enter the setting of the network protocol.

[Enter Network Protocol] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].

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

[Enter domain account] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].

14.   Select the installing components.

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

15.   Select the installing applications.

[Select applications] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].

16.   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 files into the text box and click [Next].

If not, select [Do not save parameters].

17. The Express Setup will start when you click [Perform] in [Start Express setup] step.

18. Remove NEC EXPRESSBUILDER DVD-ROM from the optical disk drive according to the message.

If you proceed the setup by using setup parameter file, remove the floppy disk from the floppy disk drive.

Insert Windows Server 2003 CD-ROM into the optical disk drive.

[Agree Software License Agreement] screen appears.

19. Read the contents carefully and click [Yes] if you do agree. If you do not agree, click [No].

> **IMPORTANT:**
>
> ■ If you do not agree to this agreement, the setup terminates and Windows Server 2003 will not be installed.
>
> ■ If "NetWare Gateway (and Client) Service" is specified to install, the window to specify the details of "NetWare Gateway (and Client) Service" pops up on the first logon. Specify the appropriate value.
>
> ■ When the following message is displayed, click [OK] and input the product key.
>
> > The setup script file does not contain a valid Product ID.
> > Contact your system administrator for a valid Product ID.

20. Insert Microsoft Windows Server 2003 R2 DISC 2 into the optical disk drive after the OS installation.

Hereinafter, proceed operations according to the message.

When the installation has finished, remove Microsoft Windows Server 2003 R2 Standard Edition DISC 2 or Microsoft Windows Server 2003 R2 Enterprise Edition DISC 2 from the optical disk drive, and restart the system.

Now the Setup using Express Setup has completed.

INSTALLING AND SETTING DEVICE DRIVERS

Follow these steps to install and configure the device drivers.

LAN Driver and PROSet

LAN Driver

LAN drivers will be installed automatically.

PROSet

> **NOTE:** All of the operation that related to IntelR PROSet is must be executed by administrator privileges. Operation by [Remote Desktop Connection] is prohibited.
>
> Without changing any parameter when opened the properties of adapter teaming, please click the [Cancel] button for close the dialog.
>
> Click [OK] button will cause temporary loss of network connectivity.

PROSet is a utility that confirms the function of network contained in network driver.

Utilizing PROSet enables the following items:

- Confirm detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Setup of teaming.

Configuring several network adapters as one team provides the server a tolerant environment on any trouble and enhances throughput between the switches.

PROSet is necessary to utilize these features.

Follow the procedure below to install PROSet.

1. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive.

   If the autorun menu is displayed, close menu screen.

2. The [Windows Explorer] dialog starts.

   * The procedure in the case of the standard start menu

       Click Start menu and click [Windows Explorer].

   * The procedure in the case of the classic start menu

       Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].

3. Run "dxsetup.exe" in the following directory.

    \017\win\winnt\dotnet\r148\apps\prosetdx\win32

    The [Intel(R) PROSet - InstallShield Wizard] dialog starts.

4. Click [Next].

5. Choose "I accept the terms in the license agreement" and click [Next].

6. Click [Next].

7. Click [Install].

8. When [InstallShield Wizard Completed] window is displayed, click [Finished].

9. Remove the NEC EXPRESSBUILDER DVD-ROM from the optical disk drive, restart the system.

LAN Driver Setting

■ Link Speed

LAN drivers will be installed automatically, but the link speed and Duplex mode need to be specified manually.

When PROSet is not installed

    1. Open the [Device Manager]

    2. Double-click [(Network Adapter Name)] in the list.

    3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

    4. Click [OK].

    5. Restart the system.

When PROSet is installed

    1. Open the [Device Manager]

    2. Double-click [(Network Adapter Name)] in the list.

    3. Click the [Link Speed] and specify the [Speed & Duplex] value the same as the value specified for HUB.

    4. Click [OK].

    5. Restart the system.

■ WOL

> **IMPORTANT:** WOL is supported by the standard network adapters only.

Refer to the following procedure for WOL(Wake On LAN) setting.

When PROSet is not installed

1. Start Device Manager.

2. Point to [Network adapters] and double click following adapter.

   Open the adapter [Properties].

   [Intel(R) 82576 Gigabit Dual Port Server Network Connection]

   [Intel(R) 82576 Gigabit Dual Port Server Network Connection #2]

3. Click [Power Management] tab and change setting in [Wake On LAN] according to the following list.

Setting item	Using WOL	Not using WOL
"Allow the computer to turn off this device to save power"	ON	ON
"Allow this device to bring the computer out of standby"	ON or OFF	OFF

   > **IMPORTANT:** Please refer to follows about function of "Allow this device to bring...".
   >
   > ON: WOL work by DirectedPacket (*1), MagicPacket (*2) on hibernate or sleep state.
   >
   > OFF: WOL do not work by DirectedPacket, MagicPacket on hibernate or sleep state.
   >
   > *1 Packet with the Ethernet address of the adapter in Ethernet header or Packet with an IP address assigned to the adapter in IP header.
   >
   > *2 MagicPacket refers to a packet dedicated to WOL.

4. Click [Advanced] tab and point to [Enable PME].

5. Set in [Value] as follows.

   – Using WOL : ON

   – Not using WOL: OFF

6. Click [OK].

7. Restart the system.

When PROSet is installed

1. Start Device Manager.

2. Point to [Network adapters] and double click following adapter.

   Open the adapter [Properties].

   [Intel(R) 82576 Gigabit Dual Port Server Network Connection]

   [Intel(R) 82576 Gigabit Dual Port Server Network Connection #2]

3. Click [Power Management] tab and change setting in [Wake On LAN] according to the following list.

Setting item	Using WOL	Not using WOL
"Wake On Directed Packet"	ON or OFF	OFF
"Wake On Magic Packet"	ON	OFF
"Wake on Magic Packet from power off state"	ON	OFF
"Wake on Link"	OFF	OFF

> **IMPORTANT:** Please refer to follows about function of "Wake On Directed Packet".
>
> ON: WOL work by DirectedPacket (*1) on hibernate or standby state.
>
> OFF: WOL do not work by DirectedPacket on hibernate or standby state.
>
> *1 Packet with the Ethernet address of the adapter in Ethernet header or Packet with an IP address assigned to the adapter in IP header.

> **NOTES:**
>
> - [Power Saver Options] setting is not necessary to change.
> - Above setting will be maintained until manually resetting are executed.

4. Click [OK].

5. Restart the system.

Setup Team

Adapter Fault Tolerance (AFT) is a feature that creates a group containing more than one adapter and automatically converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

Adaptive Load Balancing (ALB) is a feature that creates a group containing more than one adapter and enhances the throughput by operating packet transmission from the server by all the adapters.

This feature includes AFT feature.

Switch Fault Tolerance (SFT) is a feature that provides a failover relationship between two ports when each port is connected to a separate switch.

SFT supports two ports per team.

Static Link Aggregation (SLA) accounts for the GEC and 802.3ad static protocols.

SLA is a switch-assisted teaming mode and requires configuring ports at both ends of the link: server interfaces and switch ports.

IMPORTANT:

- AFT/ALB setup must be operated after system update and restarting the system.

- All the adapters specified as a group of Adapter Teaming must exist on the same LAN. If they are connected to the separate switches, they will not work normally.

- The adapters specified as a group of Adaptive Load Balancing(ALB) can be connected to only Switching Hub.

- When exchange the mother board or option network card, make sure to remove the adapter team before exchanges and recreate the adapter team after exchange complete.

- Confirm the port setting of switching hub (L2) matches the server network adapter Teaming mode.

- Teaming is not supported with Windows Server Core.

- If you want to change the type of a teaming, be sure to remove the teaming first, then re-setup a new teaming. Do not use the function of PROSet to change the type of a teaming.

Create Team

1. Open the [Device Manager].

2. Open [Network adapters] → [Intel(R) xxx] properties.

3. Click [Teaming] tab and check the [Team this adapter with other adapters] check box.

    Click [New Team].

4. Fill the name of the team in [Specify a name for the team] and click [Next].

5. Include the adapter to the team and click [Next].

6. Select a team mode, and then click [Next].

    > **IMPORTANT:** Following team types are supported.
    >
    > - Adapter Fault Tolerance
    > - Adaptive Load Balancing
    > - Static Link Aggregation
    > - Switch Fault Tolerance

7. Click [Finish].

8. Click [TEAM: "Team name"] from [Device manager] → [Network adapters] to modify the team.

    Click [Settings] tab and click [Modify Team] button.

9. Refer to the following procedure to set the team member adapter priority status.

    – Set Primary

        Point the adapter and click [Set Primary] button.

    – Set Secondary

        Point the adapter and click [Set Secondary] button.

    > **NOTE:** Adapter priority config can be confirmed by the following procedure:
    >
    > 1. Click [TEAM: "Team name"] from [Device manager] → [Network adapters].
    > 2. Click [Settings] and confirm Adapters in team list.

10. Click [Test Switch] → [Run test] to confirm the adapter team is properly setup.

    Confirm the result in [Test results]

11. Restart the system.

Remove Team

1. Open the [Device Manager].

2. Click [Network adapters], and open [TEAM: "Team name"] properties.

3. Click [Setting] tab.

4. Click [Remove Team] button.

5. Click [Yes] to the message.

6. Confirm [TEAM: "Team name"] adapter is not existing in [Network adapters] tree and restart the system.

LAN Board Driver(N8104-111/112/119/120/121/122/125A/126)

Install the driver stored in NEC EXPRESSBUILDER DVD.

Installation of LAN Board Driver

1. Start Device Manager.

2. Click [Network adapters] and double-click [(Network Adapter Name)].

    [(Network Adapter Name) Properties] appears.

    > **NOTE:** [(Intel(R) PRO/1000...)] is the name of On-Board adapter. All
    > other names show the Optional Network Board.

3. Click [Driver] tab and click [Update Driver...].

    [Hardware Update Wizard] appears.

4. Select the [Install from a list or specific location (Advanced)] radio button and click
    [Next].

5. Select the [Search for the best driver in these locations] radio button and uncheck the
    [Search removable media (floppy, CD-ROM...)] check box.

6. Check the [Include this location in the search] check box and when using [(N8104-111)],
    specify
    [\017\win\winnt\dotnet\r148\pro100\win32\ndis5x].

    Then click [Next].

    When using [(N8104-112/119/120/121/122/125A/126)], specify
    [\017\win\winnt\dotnet\r148\pro1000\win32\ndis5x].

    Then click [Next].

7. Click [Finish].

8. Restart the system.

LAN Board Driver (N8104-123A)

To install the driver, refer to the installation manual provided with the board and according to the
installation manual, use the driver stored in attached CD-ROM.

Graphics Accelerator Driver

If you use standard graphics accelerator drivers, update your system with NEC EXPRESSBUILDER DVD-ROM attached to your system.
Standard graphics accelerator drivers will be installed automatically.

Refer to "Graphics Accelerator Driver" described in Appendix G when you want to reinstall the driver individually.

Installing SCSI Controller Driver (N8103-75/95/107)

If you use the SCSI Controller N8103-75/95/107, update your system with NEC EXPRESSBUILDER DVD-ROM attached to your system.

The SCSI Controller driver will be installed automatically.

Installing SAS Controller Driver (N8103-104A)

If you use the SAS Controller N8103-104A, update your system with NEC EXPRESSBUILDER DVD-ROM attached to your system.

The SAS Controller driver will be installed automatically.

The procedure to set PAE option

If your 32-bit system has a memory capacity in excess of 4GB, setting PAE option will enable the system to be installed with over 4GB of memory.

> **IMPORTANT:**
>
> However, the Microsoft operating system products which support /PAE switch option are limited.
>
> Refer to the following article in Microsoft Knowledge Base to check the supported products.
>
> Microsoft Knowledge Base - Article ID: 291988
> "A description of the 4GB RAM tuning feature and the Physical Address Extension switch"

In Windows Server 2003 system, the PAE option can be set by editing boot.ini.

Below is the example on how to add /PAE switch to Boot.ini file.

1. Click [Start], point to [Settings], and then click [Control Panel].

2. In [Control Panel], double-click [System].

[System Properties] dialog box will be shown.

3. Click the [Advanced] tab, and then click [Settings] under [Setup and Recovery].

4. Under [System Setup], click [Edit] to open [Boot.ini].

5. Add "/PAE" to [Operating Systems] section in [Boot.ini] file, and then save it.

```
<Example of Boot.ini file>
[boot loader]
timeout=30
default=multi(0)disk(0)rdisk(0)partition(2)\WINDOWS
[operating systems]
multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003 "
/fastdetect
multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003 ,
PAE" /fastdetect /PAE
C:\CMDCONS\BOOTSECT.DAT="Microsoft Windows Recovery Console " /cmdcons
```

This is the end of editing Boot.ini file.

> **NOTE:** If you choose one of the items in the "Default operating system" drop-down list box in [Setup and Recovery] group box, you can make your system start automatically from the switch you specified.

Setting for Solving Problems

Setup your computer in advance so that it can recover from any trouble precisely and as soon as possible when it should occur.

For more information, See Page 5-88.

SETTING FOR SOLVING PROBLEMS

Setup the following issue in advance so that your computer can recover from any trouble precisely and as soon as possible when it should occur.

Memory Dump (Debug Information)

This section describes the procedures for collecting memory dump (debug information) in the server.

> **IMPORTANT:** Cautions for the Memory Dump
>
> - The staff of maintenance service representative is in charge of collecting memory dump. Customers need only to specify the memory dump.
>
> - If any trouble occurs after specifying the process below, the message to inform that the system is in short of virtual memory may appear, but continue to start the system. If you re-start the system in such case, memory dump may not be stored correctly.

When the system is Windows Server 2008 R2

Follow the procedure below to specify.

1. Click Start and select [Control Panel].

The [Control Panel] window appears.

2. Click [System and Security] and then select [System].

> **NOTE:** If [View by] is not set as [Category], start [System] from Control Panel directly.

3. Click [Advanced system settings].

The [System Properties] dialog box appears.

4. Select [Advanced] tab.

5. Click [Settings] on the [Startup and Recovery] group box.

6. Modify [Dump file] in the [Write debugging information] group box, and click [OK].

e.g. Write the debug information in D drive with the file name

"MEMORY.DMP".

D:\MEMORY.DMP

> **IMPORTANT:**
> - To specify "Complete Memory Dump" to write the debug information is recommended. If the mounted memory size is larger than 2GB, "Complete Memory Dump" cannot be specified so that specify "Kernel Memory Dump" instead.
> - Specify the drive where there is a free area more than the size of "the memory capacity mounted on Express server + 300MB".
> - In case the mounted memory size exceeds 2GB due to the added memory, change the write debugging information to [Kernel Memory Dump] before adding memory.
>   The size of debugging information (memory dump) to be taken also changes due to adding memory. Verify the size of the empty space in the debugging information (memory dump) write destination drive.

7. Click [Settings] in the [Performance] group box.

The [Performance Options] window appears.

8. Click [Advanced] tab on the [Performance Options] window.

9. Click [Change] on the [Virtual memory] group box.

10. Uncheck the [Automatically manage paging file size for all drives] box, and check [Custom size].

11. On the [Paging file size for each drive] box, specify as follows:

  – A value larger than the recommended size shown in [Total paging file size for all drives] for [Initial size]
  – A value larger than the [Initial size] for [Maximum size]

  Then click [Set].

> **IMPORTANT:**
>
> ■ The above-mentioned paging file size is recommended for collecting debug information (memory dump).
> The paging file with initial size large enough to store the dump file in the Windows Partition is required.
> Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
>
> ■ For more information on "Recommended" value, see "About the System Partition Size" described earlier.
>
> ■ In case the memory is expanded, re-specify the paging file to suit the new memory size.

---

12. Click [OK].

The message to restart the system may appear according to the modified specification.

In such case, follow the message to restart the system.

When the system is Windows Server 2008

Follow the procedure below to specify.

1. Select [Control Panel] and click [System].

The [System] dialog box appears.

2. Click [Advanced system settings].

The [System Properties] dialog box appears.

3. Select [Advanced] tab.

Click [Settings] on the [Startup and Recovery] group box.

4. Modify [Dump file:] in the [Write debugging information] group box.

e.g. Write the debug information in D drive with the file name "MEMORY.DMP".

D:\MEMORY.DMP

IMPORTANT:

Windows Server 2008 64-bit (x64) Edition

- To specify "Complete Memory Dump" to write the debug information is recommended. If the mounted memory size is larger than 2GB, "Complete Memory Dump" cannot be specified so that specify "Kernel Memory Dump" instead.
- Specify the drive where there is a free area more than the size of "the memory capacity mounted on Express server + 300MB".
- In case the mounted memory size exceeds 2GB due to the added memory, change the write debugging information to [Kernel Memory Dump] before adding memory. The size of debugging information (memory dump) to be taken also changes due to adding memory. Verify the size of the empty space in the debugging information (memory dump) write destination drive.

Windows Server 2008 32-bit (x86) Edition

- To specify "Complete Memory Dump" to write the debug information is recommended. If the mounted memory size is larger than 2GB, "Complete Memory Dump" cannot be specified so that specify "Kernel Memory Dump" instead.
- Specify the drive where there is a free area more than the size of "the memory capacity mounted on Express server + 300MB"(In case the memory capacity is more than 2GB, a free area of "2048+300MB" or more).
- In case the mounted memory size exceeds 2GB due to the added memory, change the write debugging information to [Kernel Memory Dump] before adding memory. The size of debugging information (memory dump) to be taken also changes due to adding memory. Verify the size of the empty space in the debugging information (memory dump) write destination drive.

---

5.   Click [Settings] on the [Performance] group box.

The [Performance Options] window appears.

6.   Click [Advanced] tab on the [Performance Options] window.

7.   Click [Change] on the [Virtual memory] group box.

8.   Uncheck the [Automatically manage paging file size for all drives] box, and check [Custom size].

9.   On the [Paging file size for each drive] box, specify as follows:

– A value larger than the recommended size shown in [Total paging file size for all drives] for [Initial size]

– A value larger than the [Initial size] for [Maximum size]

Then click [Set].

IMPORTANT:

■   The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.

■   For more information on "Recommended" value, see "About the System Partition Size" described earlier.

■   In case the memory is expanded, re-specify the paging file to suit the new memory size.

---

10.   Click [OK].

The message to restart the system may appear according to the modified specification.

In such case, follow the message to restart the system.

When the system is Windows Server 2003

Follow the procedure below to specify.

1. Select [Control Panel] and click [System].

The [System Properties] dialog box appears.

2. Select [Advanced] tab.

3. Click [Settings] on the [Startup and Recovery] group box.

> **IMPORTANT:**
>
> Windows Server 2003 x64 Editions
>
> ■ To specify "Complete Memory Dump" to write the debug
>   information is recommended.
>   If the mounted memory size is larger than 2GB, "Complete Memory
>   Dump" cannot be specified so that specify "Kernel Memory Dump"
>   instead.
>
> ■ Specify the drive where there is a free area more than the size of
>   "the memory capacity mounted on Express server + 1MB".
>
> ■ In case the mounted memory size exceeds 2GB due to the added
>   memory, change the write debugging information to [Kernel
>   Memory Dump] before adding memory. The size of debugging
>   information (memory dump) to be taken also changes due to adding
>   memory. Verify the size of the empty space in the debugging
>   information (memory dump) write destination drive.
>
> Windows Server 2003
>
> ■ To specify "Complete Memory Dump" to write the debug
>   information is recommended.
>   If the mounted memory size is larger than 2GB, "Complete Memory
>   Dump" cannot be specified so that specify "Kernel Memory Dump"
>   instead.
>
> ■ Specify the drive where there is a free area more than the size of
>   "the memory capacity mounted on Express server + 12MB"(In case
>   the memory capacity is more than 2GB, a free area of
>   "2048+12MB" or more).
>
> ■ In case the mounted memory size exceeds 2GB due to the added
>   memory, change the write debugging information to [Kernel
>   Memory Dump] before adding memory. The size of debugging
>   information (memory dump) to be taken also changes due to adding
>   memory. Verify the size of the empty space in the debugging
>   information (memory dump) write destination drive.

4. Specify "Complete memory dump" and modify [Dump file:] in the [Write debugging information] group box.

   e.g.   Write the debug information in D drive write the file name "MEMORY.DMP".

   D:\MEMORY.DMP

5. Click [Settings] on the [Performance] group box.

   The [Performance Options] window appears.

6. Click [Advanced] tab on the [Performance Options] window.

7. Click [Change] on the [Virtual memory] group box.

8. Modify [Initial Size] in the [Paging file size for selected drive] box to the value larger than the value of [Recommended] in the [Total paging file size for all drives], and click [Set].

> **IMPORTANT:**
>
> ■ The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
> Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
>
> ■ For more information on "Recommended" value, see "About the System Partition Size" described earlier.
>
> ■ In case the memory is expanded, re-specify the paging file to suit the new memory size.

9. Click [OK].

   The message to restart the system may appear according to the modified specification. In such case, follow the message to restart the system.

How to Create a User-mode Process Dump File

When the system is Windows Server 2008 R2

"User-mode Process Dump" is the file that records information when any application error occurs.

When any application error occurs, do not close the pop-up window that notifies the error, and then collect a dump using following process.

1.   Right-click a blank part of the taskbar and click [Task Manager], or press Ctrl + Shift + Esc to start [Task Manager].

2.   Click [Processes] tab.

3.   Right-click on process name that you want to collect dump, and then click [Create Dump File].

4.   The dump file is stored in following directory.

C:\Users\<User Name>\AppData\Local\Temp

> **NOTE:** The folder may be treated as hidden folder. If the folder does not appear, run Explorer and select [Organize] - [Folder and search options] -[View], and check to [Show hidden files, folders, and drives].

When the User-mode Process Dump is created, pick up the file from the directory described in Step 4.

Refer to Knowledge Base of Microsoft web-site for more information about the User-mode Process Dump file collection.

"How to create a user-mode process dump file in Windows Server 2008"

http://support.microsoft.com/kb/949180/en-us

> **NOTE:** For Windows Server 2008 R2, Dr. Watson is replaced by [Problem Reports and Solutions], therefore, you can not collect the Crash Dump file by existing Dr. Watson.
>
> The above process provides you the information same level as the Crash Dump file.

When the system is Windows Server 2008

"User-mode Process Dump" is the file that records information when any application error occurs.

When any application error occurs, do not close the pop-up window that notifies the error, and then collect a dump using following process.

1. Right-click a blank part of the taskbar and click [Task Manager], or press Ctrl + Shift + Esc to start [Task Manager].

2. Click [Processes] tab.

3. Right-click on process name that you want to collect dump, and then click [Create Dump File].

4. The dump file is stored in following directory.

   C:\Users\<User Name>\AppData\Local\Temp

   > **NOTE:** The folder may be treated as hidden folder. If the folder does not appear, run Explorer and select [Tools] - [Folder Options...] - [View], and check to [Show hidden files and folders].

   When the User-mode Process Dump is created, pick up the file from the directory described in Step 4.

   Refer to Knowledge Base of Microsoft web-site for more information about the User-mode Process Dump file collection.

   "How to create a user-mode process dump file in Windows Server 2008"

   http://support.microsoft.com/kb/949180/en-us

   > **NOTE:** For Windows Server 2008, Dr. Watson is replaced by [Problem Reports and Solutions], therefore, you can not collect the Crash Dump file by existing Dr. Watson.
   >
   > The above process provides you the information same level as the Crash Dump file.

When the system is Windows Server 2003 (Dr.Watson)

Dr. Watson is a debugger for application errors. If any application error is detected, Dr. Watson diagnoses the server and logs diagnostic information (log). Follow the procedure below and specify Dr. Watson to collect diagnostic information.

1. Click [Run] on Start menu.

2. Type "drwtsn32.exe" in the [Open] box, and click [OK].

    The [Dr. Watson for Windows] dialog box appears.

3. Specify the location to store the diagnostic information in the [Log File Path] box.

    The diagnostic information will be stored with the file name "DRWTSN32.LOG".

    > **NOTE:** You can not specify network pass. Specify the pass on local computer.

4. Specify the location of crash dump file in the [Crash Dump] box.

    > **NOTE:** "Crash Dump File" is a binary file that can be read with Windows Debugger.

5. Select [Full] radio button from [Crash Dump Type].

6. Check the following check box on the [Options] box.

    ☐ Dump Symbol Table

    ☐ Dump All Thread Contexts

    ☐ Append TO Existing Log File

    ☐ Create Crash Dump File

    For more information on each function above, refer to Online Help.

7. Click [OK].

Network Monitor

Utilizing Network Monitor helps you to investigate and manage with network trouble.

Network Monitor Setup (Windows Server 2008 R2/Windows Server 2008)

Microsoft Network Monitor allows you to examine and troubleshoot network problems.

> **NOTE:** Windows Server 2008 R2/Windows Server 2008 does not provide Network Monitor.
>
> To use Network Monitor on Windows Server 2008 R2/Windows Server 2008, install Network Monitor by following the steps below.

1. Download Microsoft Network Monitor from the following web site:
    http://support.microsoft.com/kb/933741/en-us

2. Run the downloaded file to start the installer.

    Follow the on-screen instructions to install Network Monitor.

    > **NOTE:** If a Security Alert appears, click [Run]. Select [Complete] for a setup format.

3. Network Monitor is installed.

    > **NOTE:** To remove Network Monitor, go to [Programs and Features].

Network Trace Capture (Windows Server 2008 R2/Windows Server 2008)

1. On the Start menu, start Microsoft Network Monitor.

2. On [Start Page], select [Create a new capture tab...] or select [New] in the [File] menu, and click [Capture...].

    A new tab for capturing a network trace is created.

3. On the [Select Networks] window, select a network you want to capture a trace.

4. On the [Capture] menu, click [Start] to start capturing a network trace.

5. On the [Capture] menu, click [Stop] to stop capturing a network trace.

6. On the [File] menu, select [Save As...].

    The [Save As] window appears. Select [All captured frames] from [Frame selection], and enter the names of a folder and a file.

    > **NOTE:** The default folder name is:
    > C:\Users\<User name>\Documents\Network Monitor 3\Captures

7. Click **Save** to create the file in the folder selected in step 6.

Network Monitor (Windows Server 2003)

To utilize Network Monitor, you need to restart the system after the installation has completed, so we recommend to install Network Monitor before any network trouble may occur.

1. Point to [Settings] from Start menu and click [Control Panel].

    The [Control Panel] dialog box appears.

2. Double-click [Add or Remove Programs].

    The [Add or Remove Programs] dialog box appears.

3. Click [Add/Remove Windows Component].

    The [Windows Components Wizard] dialog box appears.

4. Click [Management and Monitoring Tools] and then click [Details].

    The [Management and Monitoring Tools] dialog appears.

5. Click to select the [Network Monitor Tools] check box, and then click [OK].

6. The [Windows Components Wizard] dialog box appears again, so click [Next].

7. If the setup asks to install the disk, insert the OS CD-ROM into optical disk drive and click [OK].

8. Click [Finish] in the [Windows Component Wizard] dialog box.

9. Close the [Add or Remove Programs] dialog box.

10. Close the [Control Panel] dialog box.

To start Network Monitor, point to [Program] → [Administrative Tools] and click [Network Monitor]. For information on how to operate Network Monitor, refer to Online Help.

Re-installing the Operation System if Multiple Logical Drives Exist

Before Re-installing the Operation System

Be sure to make backup copies before re-installing the operation system just in case.

Re-installing the Operation System

1. Start the clean installation following the procedure described in this manual.

2. Specify the partition in which you want to install the operating system when the following message appears:

   <Windows Server 2008 R2/Windows Server 2008>

   > Where do you want to install Windows?

   <Windows Server 2003>

   > The following list shows the existing partitions and
   > unpartitioned space on this computer.
   >
   > Use the UP and DOWN ARROW keys to select an item in the list.

   * Cannot modify the drive letter of your system or boot volume. Confirm the proper drive letter is assigned and then, continue the setup.

3. Continue the clean installation again following the procedure described in this manual.

4. The drive letter of the re-installed system may differ from the one of the previous system. If you need to modify the drive letter, modify it according to the "Procedure for Modifying the Drive Letter".

Procedure for Modifying the Drive Letter

Be careful that the drive letter of the system or boot volume cannot be modified with the following procedure.

<Windows Server 2008 R2/Windows Server 2008>

1. Click Start menu, right-click [Computer], and specify [Manage] to start [Server Manager].

2. Specify the [Storage] - [Disk Management] in the left side of the window.

3. Right-click the volume you want to modify the drive letter and specify the [Change Drive Letter and Paths...].

4. Click [Change...].

5. Choose the [Assign the following drive letter] and specify the drive letter you want to assign.

6. Click [OK].

7. If the following message appears, click [Yes].

> Some programs that rely on drive letters might not run correctly.
> Do you want to continue?

8. Close the [Server Manager].

<Windows Server 2003>

1. Click Start menu, right-click [My Computer], and specify [Manage] to start [Computer Management].

2. Specify the [Disk Management] in the left side of the window.

3. Right-click the volume you want to modify the drive letter and specify the [Change Drive Letter and Paths...].

4. Click [Change...].

5. Choose the [Assign the following drive letter] and specify the drive letter you want to assign.

6. Click [OK].

7. If the following message appears, click [Yes].

> Changing the drive letter of a volume might cause programs to no longer run.
> Are you sure you want to change this drive letter?

8. Close the [Computer Management].

INSTALLING MAINTENANCE UTILITIES

Various maintenance utilities are contained in your NEC EXPRESSBUILDER DVD-ROM. See Chapter 6 for installing the utilities to your server or management workstations.

UPDATING THE SYSTEM

> **IMPORTANT:** If you install Windows Server 2003 CD-ROM which contains Service Pack 2 to your system, you do not have to apply Service Pack 2 again.

"Updating the System" is executed by Express Setup automatically.

Execute "Updating the System" in following cases.

- Modified system configuration.
- Recovered the system using recovery process.

See "Updating the System" section in Appendix D for detail of update process.

MAKING BACKUP COPIES OF SYSTEM INFORMATION

The system information includes the current BIOS settings and any specific information for the server.

Save the information after completing the system setup.

Without the backup data, you will not be able to recover the information.

You can save the information by the following process.

1. Connect Flash FDD or USB FDD to the USB connector.

2. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive and reboot the system.

3. Select [Tool menu (Normal mode)].

4. Select [English].

5. Select [Maintenance Utility].

6. Select [System Information Management].

7. Select [Save].

Installing with the OEM-Disk for Mass Storage Device

This section explains how to setup with the OEM-Disk. You usually do not have to do as follows. If your system has any Mass storage devices, you have to set as follows depending on your system. The detailed information is provided by the manual of the Mass storage device.

Installation of Mass Storage Device not to be Supported by Express Setup

If you would like to install or re-install the OS when the system has new mass storage device not to be supported by NEC EXPRESSBUILDER, you have to set as follows.

1. Read the manual supplied with the mass storage device before setting the server.

2. If the mass storage device is RAID Controller, configure the RAID System before running the NEC EXPRESSBUILDER.

3. Boot the system from NEC EXPRESSBUILDER DVD-ROM.

4. Select [Load the optional driver into the EXPRESSBUILDER] from the Top menu, click [Next].

Setting the driver disk for the mass storage controller. Press the "Perform" button.

> **NOTE:** By choosing this option, you can load the driver provided by CD-ROM or floppy disk to proceed with the Express Setup.

5. Perform Express Setup with the following settings.

(a) When "Enter RAID settings" appears, check "Skip the logical drive creation".

(b) Confirm [Apply OEM-Disk for mass storage device] is displayed in [Selected applications] box at "Select applications" steps.

Chapter 6
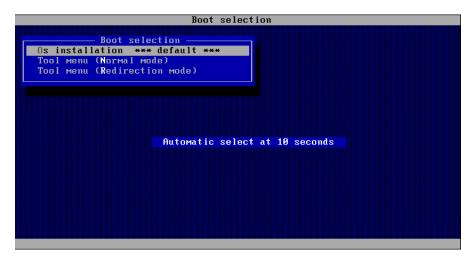
Installing and Using Utilities

This section describes how to use the NEC EXPRESSBUILDER DVD-ROM that comes with your server and to install the utilities stored on the NEC EXPRESSBUILDER.

NEC EXPRESSBUILDER
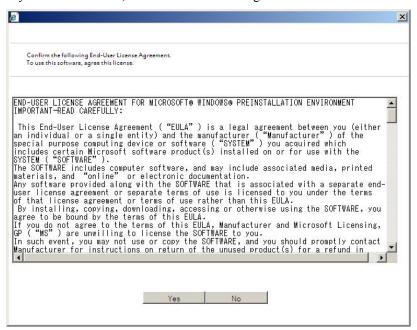
The NEC EXPRESSBUILDER helps you install the Operating system/the Management software or use the maintenance utilities.

When you insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive and restart the system, the following menu appears.

■ Os installation

If you select this item, the Software License Agreement screen of Windows PE appears.

If you click [Yes], the Top menu appears.

> **IMPORTANT:** This tool is Configuration Tool that built on Windows
> PE technology.
> Pay attention to the automatic reboot that occurs after 72 hours from
> start.
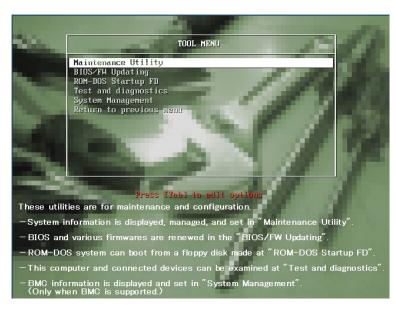
You can use the Express Setup (see Chapter 5) or the following functions from this menu.

− Create the OEM-Disk
  You can create the Windows OEM-Disk to use at the Windows manual setup.

− Load the driver
  This function is not usually used. If you add the new device to the server, this function
  may use. (See Chapter 5.)

■   Tool menu (Normal mode)

If you select this item, the Tool menu appears.

You can use the below functions for maintenance.

– Maintenance Utility

The Maintenance Utility is usually used by the service representative. (See Chapter 8.)

– BIOS/FW Updating

You can update the system BIOS by using the Flash FDD or USB FDD.

– ROM-DOS Startup FD

The ROM-DOS Startup FD is used for starting the ROM-DOS system.

– Test and diagnostics

This function allows you to diagnose this computer. (See Chapter 7.)

– 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".

■   Tool menu (Redirection mode)

If you want to operate this computer via the BIOS redirection (the console-less function), select this item.
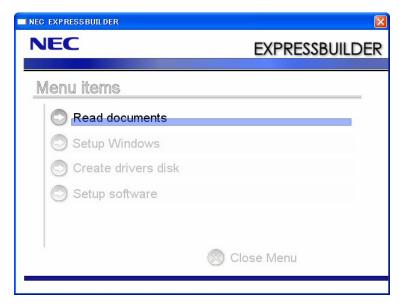
NOTE: If you operate this computer via the Remote KVM function, select the "Tool menu (Normal mode)".

The menu's functions are the same as the "Tool menu (Normal mode)".

Autorun Menu

When the NEC EXPRESSBUILDER DVD-ROM 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).
>
> - Some documents are provided in PDF format. Use the Adobe Reader to view or print these documents.

If the menu does not appear, select "My computer" by using the Explorer, and double-click the icon of the optical disk drive that contains the NEC EXPRESSBUILDER DVD-ROM.

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 [Parameter file] that is used for configuring the server with the Express Setup (see Chapter 5 for details).

If you use the Parameter 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 confirm the specification. Also, you can install the system with the same specification as before when re-installing the system. We recommend you to create [Parameter file] to setup the servers from NEC EXPRESSBUILDER.

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

IMPORTANT:

- You cannot create [Parameter file] for Microsoft Windows Server 2003 x64 Editions.

- The setup using a parameter file saved in the Flash FDD is not supported.

NOTE: You can install Windows Server 2008 R2/Windows Server 2008/Windows Server 2003 without [Parameter file].
Also, you can modify/newly create [Parameter file] during the setup with NEC EXPRESSBUILDER.
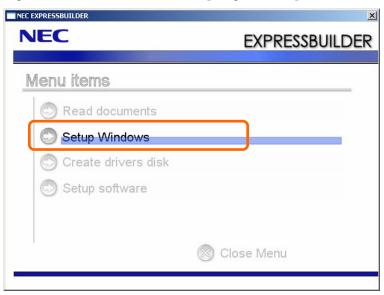
Parameter File

This section describes about specifying setup information that is necessary for OS installation and creating [Parameter file].
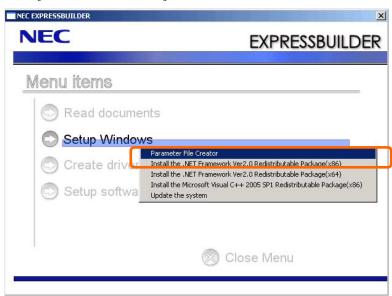
Follow the procedure below.

> **IMPORTANT:** Do not remove NEC EXPRESSBUILDER
> DVD-ROM from drive during a parameter file creation.

1. Start the OS.

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

    The menu will appear.

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

4.   Click [Parameter File Creator].
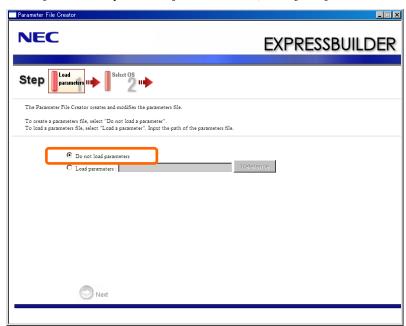
Parameter File Creator will appear.
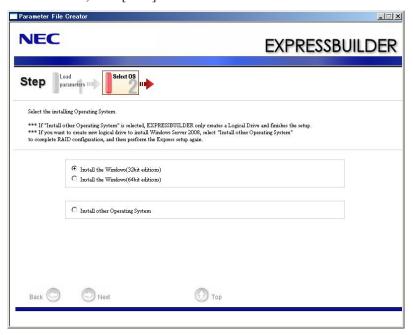
5. [Load Parameters] step is displayed.

Select [Do not load parameters] from the menu, click [Next].
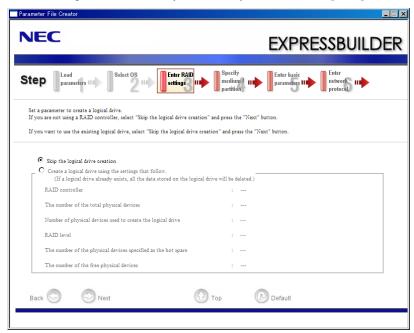
6. Select the installing Operating System.

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.
Confirm the parameters, modify if necessary, and then click [Next].

IMPORTANT: At "The number of the total physical devices",
Parameter File Creator displays upper limit that the RAID Controller
can support.
The total of "The number of physical devices used to create the logical
drive" and "The number of the physical devices specified as the hot
spare" must not exceed "The number of the total physical devices"
which connected to the target system.
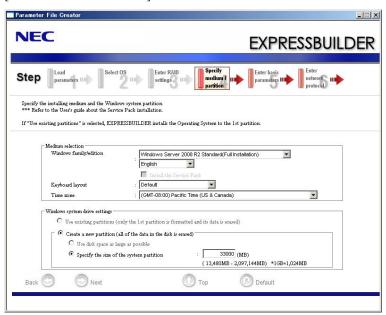
NOTE: You can use only the physical devices that have same model
number to configure logical drive.

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 R2]


[Windows Server 2008]

[Windows Server 2003]

IMPORTANT:

- If you install Windows Server 2003 R2 and Service Pack, apply Windows Server 2003 R2 DISC 2 after Express Setup completion, and then install Service Pack by "Updating the system".

- About partition size
  - Specify the partition size larger than required minimum size for OS installation.
  - Do not specify larger partition size than the capacity of connected hard disk drive.
  - You can not specify a logical drive larger than 2,097,144MB at RAID system.

- 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 when you operate Windows Server 2008 R2, NEC EXPRESSBUILDER installs the Operating System to the Windows partition (The Boot partition (if it exists) and the Windows partition are deleted).
  The data in the other partition is kept if the system has two or more partitions. (See the figure below.)

Boot Partition Deleted	Windows Partition Deleted	User Data Partition Retained

- If "Use existing partitions" is selected when you operate Windows Server 2008 or Windows Server 2003, NEC EXPRESSBUILDER installs 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
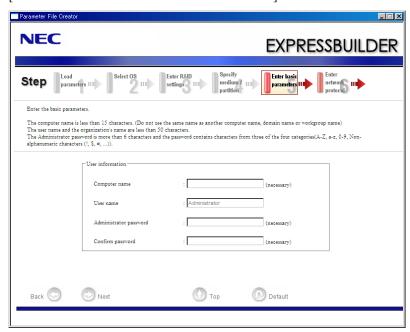
- You cannot re-install the system with the existing partition that is upgraded to Dynamic Disk remained. Do not select "Use existing partitions" at "Windows system drive settings".
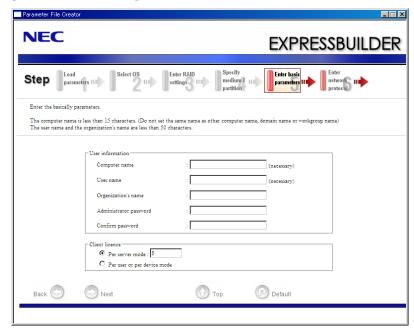
9.   Enter the user information and client license mode.

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

[Windows Server 2008 R2/Windows Server 2008]

[Windows Server 2003]
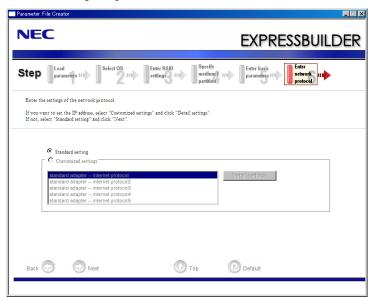
> **IMPORTANT:** Computer name and User name are required
> parameters.

> **NOTE:** Even if you do not input value into "Administrator password",
> "Confirm password", "●●●●●" is displayed.

10. Enter the setting of the network protocol.
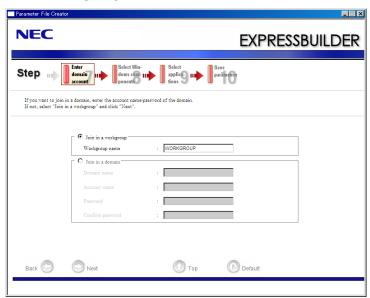
[Enter network protocol] steps are displayed. Confirm the parameters, modify if necessary,
and then click [Next].

> **NOTE:** The order of entry in custom setting may differ from the
> numbering of LAN port.

11.   Enter the domain or workgroup name to be used.
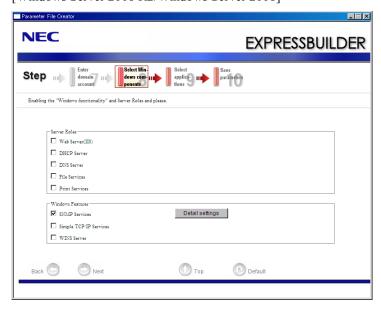
[Enter domain account] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].
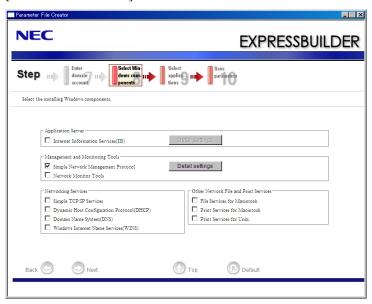
12.   Select the installing components.

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

[Windows Server 2008 R2/Windows Server 2008]
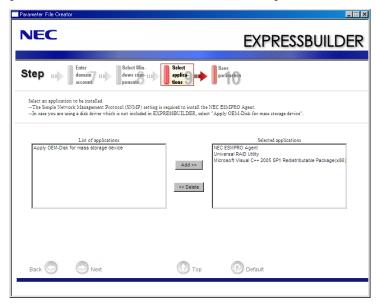
[Windows Server 2003]
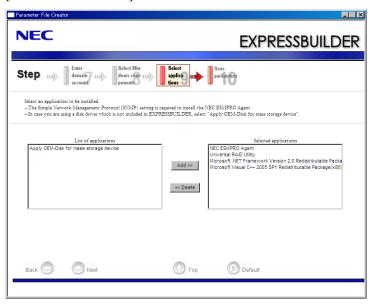
13. Select the installing applications.

[Select applications] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].

[Windows Server 2008 R2/Windows Server 2008]
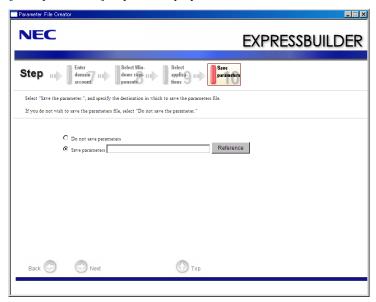
[Windows Server 2003]

14.   Save the parameters.
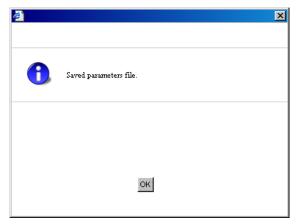
[Save parameters] steps are displayed.

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

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

If not, select [Do not save parameters].
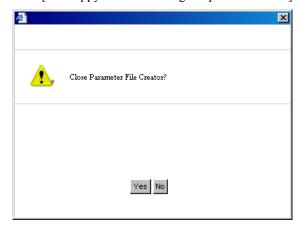
15. Saved to a floppy disk.

Now [the floppy disk containing the parameters file] has been created.

Click [Yes] to exit Parameter File Creator.

NOTES:

- If you modify existing information file (parameter 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

The NEC ESMPRO lets a system administrator manage remote servers across a network. NEC ESMPRO monitors server hardware and software configurations, failures, and performance. With log data collected by NEC ESMPRO, a system administrator can track long-term and short-term performance, monitor server usage, and check server failure rates. The administrator can use the information collected to create more efficient data routing procedures and optimize server usage.

Functions and Features

The NEC ESMPRO offers many functions and features for managing remote servers across a network. These features help the system administrator perform daily system operation, system extension, and transfer tasks. Some features of NEC ESMPRO Manager include:

- Hardware and software server configuration
    - Hardware resources mounted in servers, such as the CPU, memory, disks, RAID System, and LAN boards.
    - Software resources, such as operating system information and drivers running on each server.
- Server failures
    - On-screen real-time displays provide the system administrator with the failure type, location, cause, and suggested corrective action.
    - Failure data includes hardware failure information such as system board temperature, memory failure, crashes, and software failure information.
- Performance
    - NEC ESMPRO monitors server performance and displays server usage on the screen and displays information, such as the rate of CPU load, memory usage, disk usage, and LAN traffic. Usage threshold values can help the system administrator monitor and prevent server overloads.

NEC ESMPRO Agent Extension

The NEC ESMPRO Agent Extension is software for the remote management of this server.

See the online documents for details on the functions and installation of the NEC ESMPRO Agent Extension.

NEC ExpressUpdate Agent

The NEC ExpressUpdate Agent enables you to control the version of the firmware and software that are installed on the server.

Using the NEC ESMPRO Manager, you can download update packages automatically and install them simply without terminating the system.

Refer to "Installation Manual" in the NEC EXPRESSBUILDER for more information about an installation and functions of the NEC ExpressUpdate Agent.

> **IMPORTANT:** To get the information of the update package which does not support NEC ExpressUpdate, please refer to the web site below.
>
> http://www.nec.com/global/prod/express/index.html

For installation procedure and detailed explanations on NEC ESMPRO, refer to the online document in the NEC EXPREDSBUILDER DVD.

Universal RAID Utility

Universal RAID Utility is an application to manage or monitor the following RAID Controllers.

- Onboard RAID Controller (LSI Embedded MegaRAID™)

- N8103-129 RAID Controller (256 MB, RAID 0/1)*

- N8103-130 RAID Controller (256 MB, RAID 0/1/5/6)*

Before attempting to operate Universal RAID Utility, read the "Universal RAID Utility Ver2.3 User's Guide" contained in NEC EXPRESSBUILDER DVD-ROM. The manual explains the installation procedure and notes on operating Universal RAID Utility.

Setup with Express Setup

You can install Universal RAID Utility with Express Setup contained in NEC EXPRESSBUILDER DVD-ROM. When you start the Express Setup, a dialog to specify an application appears. Select [Universal RAID Utility] on the dialog.

Manual Setup

Windows

You can start the setup program of Universal RAID Utility from [Autorun Menu].

Click [Setup Software] → [Universal RAID Utility] in [Autorun Menu].

You need to install the following software.

- Microsoft .NET Framework 2.0 or later
- The Runtime component of the Microsoft Visual C++ 2005 SP1

You can install these software from [Autorun Menu] too.

Click [Setup Windows] → [Install the .NET Framework Ver 2.0 Redistributable Package (x86)] (If CPU architecture is x64, [Install the .NET Framework Ver2.0 Redistributable Package (x64)]) in [Autorun Menu] for the setup of Microsoft.NET Framework 2.0.

Click [Setup Windows] → [Install the Microsoft Visual C++ 2005 SP1 Redistributable Package(x86)] (Use the x86 package whatever the CPU architecture may be.) for the setup of the Runtime component of the Microsoft Visual C++ 2005 SP1.

・**Microsoft .NET Framework**

To use the RAID Viewer and Log Viewer, Microsoft .NET Framework Version 2.0 or higher is required.
Windows Server 2008 and Windows Server 2008 R2, Windows Vista, Windows 7 include .NET Framework Version 2.0 or higher. Therefore, you do not need to install .NET Framework in case of using them.

・**Runtime component of Microsoft Visual C++ 2005 SP1 library**

To use the RAID Viewer, the runtime component of the Microsoft Visual C++ 2005 SP1 library is required.
Windows Server 2008 and Windows Server 2008 R2, Windows Vista SP1 or later, Windows 7 include the runtime component of the Microsoft Visual C++ 2005 SP1 library. Therefore, you do not need to install the runtime component of the Microsoft Visual C++ 2005 SP1 library in case of using them as operating system.

Linux

You need to run the setup.sh in the install image of Universal RAID Utility.

There is the install image of Universal RAID Utility in the following directory of NEC EXPRESSBUILDER.

/*BBB*/lnx/pp/uraidutl

The part of BBB is BBB of the medium number (5.AA-BBB.CC) of NEC EXPRESSBUILDER.

Creating Logical Drive of RAID 6

You must use four or larger Physical Devices for creating the Logical Drive of RAID 6 by Universal RAID Utility. If you want to create the Logical Drive from three Physical Devices, you need to use WebBIOS.
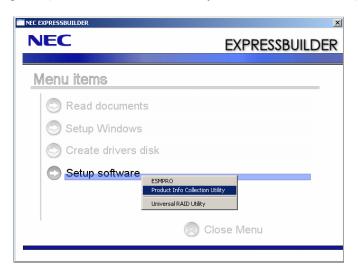
NEC PRODUCT INFO COLLECTION UTILITY

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-ROM.

Installation

You can install this utility according to the following procedure.

1. Insert NEC EXPRESSBUILDER DVD-ROM 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:

- 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

Except for Server Core

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.

For Server Core

Enter the following command from the command prompt.

Wmic product where name="Product Info Collection Utility" call uninstall

Chapter 7

Maintenance

This chapter describes the daily maintenance of the server and precautions when relocating or storing the server.

MAKING BACKUP COPIES

NEC recommends you make backup copies of your valuable data stored in hard disk drives of the server on a regular basis. For backup storage devices suitable for the server and backup tools, consult with your service representative.

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.

Also make a backup copy of the RAID System configuration data by using NEC EXPRESSBUILDER, if your system is in the RAID System configuration. When your hard disk drives have been auto-rebuilt due to a failure, it is recommended to make a backup copy of the configuration data. For how to make a backup copy of the configuration data, see Chapter 3.

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. Failure to follow these instructions may result in death or serious personal injury. See pages 1-4 to 1-12 for details. ■ Do not disassemble, repair, or alter the server. ■ Disconnect the power plug before working with the server.

Cleaning the Server

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 and 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 off-powered (the POWER/SLEEP lamp goes 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 lukewarm 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, 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 Interior

One of the most important items in a good maintenance program is regular and thorough cleaning of the interior of the server, especially around the mother board.

Dust buildup inside the server can lead to several problems. As dust acts as a thermal insulator, a buildup can prevent proper system cooling. Excessive heat will shorten the life of server components. Also, dust may contain conductive or corrosive materials that can cause short circuits or corrosion of electrical contacts.

How often you should clean the interior of the server depends on the environment in which it is located. For most office environments, you probably should clean the server every 12 months. For more severe environments, clean the interior every 6 months.

Cleaning the interior of the server entails powering off the server and removing the left side cover. You will need a small vacuum cleaner (with plastic tipped nozzle and electrostatic protection), computer grade canned air, and a small brush for cleaning the interior.

Follow the procedure below to clean the interior of the server.

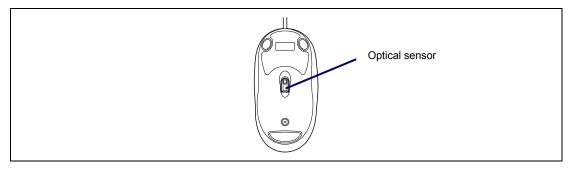| ⚠ **WARNING** |
|---|
| Unplug all power cords.

Unplug all power cords before performing any maintenance. Voltage is present inside the server and display unit even after the power is turned off. All voltage is removed only when the power cord is unplugged. |

IMPORTANT: Do not use the brush made of chemical fabric, or the cleaning material that will generate an electrostatics.

1. Turn off the server and unplug all power cables.
2. Remove the left side cover. (See Chapter 9.)
3. Remove the dust accumulate on the air inlet of the front and the rear fan.
4. Use a small brush to loosen any dust and debris on the mother board.
5. Use computer grade canned air to blow dust off components on the mother board.
6. Use a small vacuum cleaner with plastic tip to vacuum out dust and debris from the interior of the server.
7. Reinstall the left side cover. (See Chapter 9.)
8. Reconnect all power cables and turn on the server.

Cleaning the Keyboard/Mouse

Make sure that the server and peripheral devices are all off-powered (the POWER/SLEEP lamp goes off), and then wipe the keyboard surface with a dry cloth.

The mouse does not work normally if its optical sensor is stained. Wipe the optical sensor with a dry cloth.

Optical sensor

Cleaning Disc

A dusty disc or dust-accumulated tray causes the device to fail to read data correctly.

Follow the procedure below to clean the tray and disc regularly:

1. Make sure that the server is powered (the POWER/SLEEP LED is lit).

2. Press the CD tray Open/Close button on the front of the optical disk drive. The tray opens.

3. Hold the disc lightly and take it out from the tray.
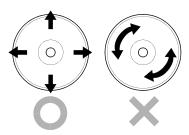
    > **NOTE:** Do not touch the signal side of the disc with your hand.

4. Wipe the tray with a dry soft cloth.

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

5. Push on the tray front to close the tray.

6. Wipe the signal side of the disc with a dry soft cloth.

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

SYSTEM DIAGNOSTICS

The System Diagnostics runs several tests on the server.

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

Test Items

The following items are tested in system diagnostics.

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

> **IMPORTANT:** When executing the system diagnostics, make sure to disconnect the LAN cable. Executing the system diagnostics with the LAN cable connected, the network may be influenced.

> **NOTE:** On checking the hard disk drive, no data is written into the disk.

Startup and Exit of System Diagnostics

There are two ways to diagnose the server: to use the local console (keyboard) of the server itself, and to use the management PC via serial port (remote console).

> **IMPORTANT:** Two methods of LAN and the serial port are mentioned in "MAINTENANCE TOOLS" of Chapter 8 "Troubleshooting" in the way of communicating in remote console.
> Use the serial port to execute System Diagnostics with remote console. The LAN connection is not for System Diagnostics.
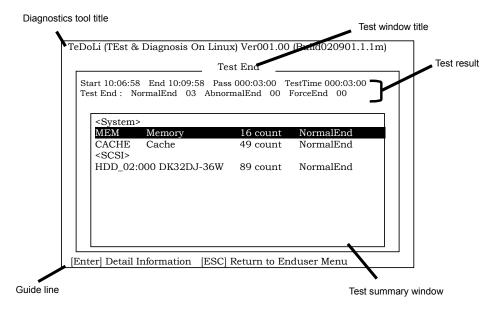
Procedures to start the diagnostics program are as follows:

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-ROM to start the system.

5. Select [Tool menu (Normal mode)] when local console of the server is used for, or select [Tool menu (Redirection mode)] when remote console is used for.

> **NOTE:** 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

Test window title

Test result

Guide line

Test summary window

```
TeDoLi (TEst & Diagnosis On Linux) Ver001.00 (Build020901.1.1m)

                           Test End
  Start 10:06:58   End 10:09:58   Pass 000:03:00   TestTime 000:03:00
  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




  [Enter] Detail Information   [ESC] Return to Enduser Menu
```

– 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.

– Guide line

Shows the details of the keys to operate window.
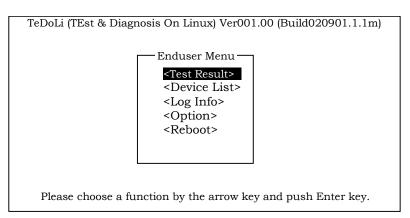
– Test summary window

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 service representative.

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

The [Enduser Menu] below is displayed.

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

<Test Result> Shows the diagnostics completion screen of the above diagnostics.

<Device List> Shows a list of connected devices.

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

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

<Reboot> Reboots the system.

8.   Select <Reboot> in the [Enduser Menu] above.

The server restarts and the system is started from the NEC EXPRESSBUILDER.

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

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

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

12. Plug in the power cord.

This completes the system diagnostics.

Notes on Using Power Control Feature

Power consumption of the server can be controlled through command line interface of EXPRESSSCOPE Engine 2 (BMC) or NEC ESMPRO Manager. Using this feature to suppress the upper limit of power consumption, the larger number of servers can be installed in the site where the allowable power consumption is limited.

Refer to the User's Guide of EXPRESSSCOPE Engine 2 or Online Help of NEC ESMPRO Manager for how to enable this feature.

Applicable OS

Power control feature uses P-State (Performance State) of processor that is defined in ACPI (Advanced Configuration and Power Interface). Thus, the OS must support P-State. The following OSs support the power control feature.

OS that supports power control feature

- Windows Server 2003, Standard Edition (SP1 or later)
- Windows Server 2003, Enterprise Edition (SP1 or later)
- Windows Server 2003 R2, Standard Edition
- Windows Server 2003 R2, Enterprise Edition
- Windows Server 2003 R2, Standard x64 Edition
- Windows Server 2003 R2, Enterprise x64 Edition
- Windows Server 2008, Standard
- Windows Server 2008, Enterprise
- Windows Server 2008, Standard x64
- Windows Server 2008, Enterprise x64
- Red Hat Enterprise Linux 5.3 or later
- Red Hat Enterprise Linux 5.3 or later (EM64T)

Notes on Using Windows Server 2008

The following event will be logged in Event Viewer if power control feature is used on Windows Server 2008. However, it is not the problem in operating the system, the event is logged because the P-State is controlled by the server side.

Event ID:	7
Source:	Kernel-Processor-Power
Level:	Warning
Description:	The speed of processor 0 is being limited by system firmware. The processor has been in this reduced performance state for 71 seconds since the last report.

RELOCATING/STORING THE SERVER

Follow the procedure below to relocate or store the server:

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-4 to 1-12 for details.

- Do not disassemble, repair, or alter the server.
- 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. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details.

- Never attempt to lift the server only by two or less persons.
- Do not install the server in any place other than specified.
- Do not pinch your finger with mechanical component.
- Do not connect/disconnect any interface cable with the power cord of the server plugged to a power source.
- Avoid installation in extreme temperature conditions.

IMPORTANT:

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

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

- Make sure not to apply a shock to hard disk drives to relocated the server if the contains any.

1. Take a media out of the server, if any.

2. Power off the server (the POWER/SLEEP lamp goes off).

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

4. Remove all the cables from the server.

5. Hold the server by its bottom to carry the server.

> **IMPORTANT:** Do not hold the front mask to lift the server. The front mask may be disengaged from the server, causing personal injury.

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

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Chapter 8

Troubleshooting

If your server does not operate as expected, read this chapter before assuming a failure.
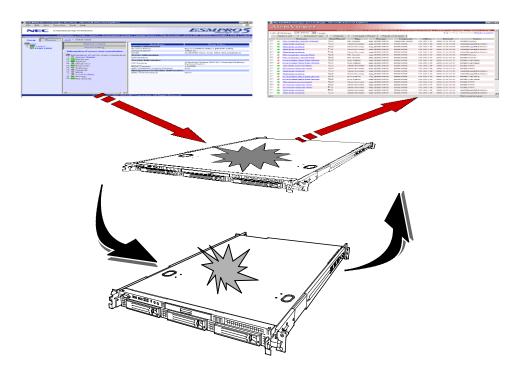
> **NOTE:** For provision against an unexpected failure, it is recommended to install the maintenance utility, NEC ESMPRO, to the server and client computers.

System Viewers

Monitor the occurrence of fault by using NEC ESMPRO Manager 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 in NEC ESMPRO Manager.

Example

> **NOTE:** For provision against an unexpected failure, it is recommended to install NEC ESMPRO Manager to your computer.

Status Indicators

This section explains the indication and meanings of the server LEDs.

POWER LED ( )

The POWER LED is on (green) while the server is being powered. It is off while no power is supplied to the server. It flashes while the server is in standby status.

STATUS LED ( )

The STATUS LED is on (green) while the server is operating normally. If the STATUS LED is off or turns amber and flashes, it indicates that the server is in abnormal state.

The table below explains the STATUS LED indication, the meanings, and the procedures.

> **NOTES:**
>
> - If NEC ESMPRO is installed, you can confirm the cause of a failure by referring to the error log.
>
> - If shutdown processing can be performed via the operating system when you want to restart the system after turning the power off, restart the system by performing shutdown processing. If shutdown processing cannot be performed, restart the system by resetting the system, forcibly turning the power off, (see page 8-60), or disconnecting and then connecting the power cord.

STATUS LED indication	Description	Procedure
On (green)	The server is operating normally.	–
Flashing (green)	The server is operating with the memory in degraded state. An uncorrectable memory error has often occurred.	Identify the device in degraded state by using the BIOS setup utility "SETUP," and replace it as soon as possible.
Off	The power is off.	–
	POST is in progress.	Wait for a while. The STATUS LED turns green when POST is completed.
	A CPU error occurred. (IERR)	Turn the power off and then turn it on. If the POST screen displays an error message, take notes of the message, and contact your sales representative.
	A timeout occurred when the time set for the watchdog timer arrived.	
	A CPU bus error occurred.	
	A memory dump request is made. (The STATUS LED stays on (green) during a dump caused by software.)	Wait until the memory dump is completed.
On (amber)	A temperature alarm was detected.	Check if the internal fans are clean and if the fan units are firmly connected. If the STATUS LED indication does not change when the fans are normal, contact your sales representative.
	A voltage alarm was detected.	Contact your sales representative.
	All the power supply units failed.	
	A CPU temperature alarm was detected.	
	A temperature alarm was detected on chipset.	
Flashing (amber)	Either of the following was detected in the redundant power configuration: AC power not supplied to one of the two power supply units Failure of one of the two power supply units	Connect the power cord to supply power. If the power supply unit is faulty, contact your service representative.
	A fan alarm was detected.	Check if the fan units are firmly connected. If the STATUS LED indication does not change when the fans are normal, contact your sales representative.
	A temperature warning was detected.	Check if the internal fans are clean and if the fan units are firmly connected. If the STATUS LED indication does not change when the fans are normal, contact your sales representative.
	A voltage warning was detected	Contact your service representative.
	An error was detected on either of the hard disk drives.	
	Detected that the top cover is open.	Check if the top cover is open or not.

DISK ACCESS LED (⬛)

The DISK ACCESS LED indicates the status of the hard disk drive mounted in the hard disk drive bay.

The LED turns green each time access is made to the hard disk drive.

When the DISK ACCESS LED turns amber, it indicates that a hard disk drive failure has occurred. Check the hard disk drive LED for the status of the failing hard disk drive.

ACT LED (⬛)

The ACT LED is green while the server is connected to the LAN. The LED flashes while the server is accessed via the LAN (during transmission/reception of packets). The number next to the icon indicates the network port number on the rear panel of the server.
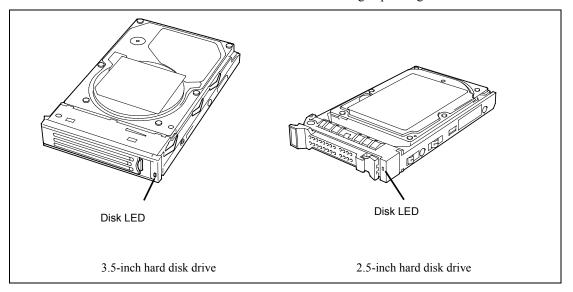
UID LED (ID)

When the UID switch is pressed, the front panel UID LED (blue) and the motherboard UID LED turn on or flash. The motherboard UID LED is visible through the rear of the chassis and allows you to locate the server you're working on from the rear of the servers on a rack. For details, see **Identification of Servers ~ UID Switch ~** on page 2-24.

> **NOTE:** LEDs can be turned on or made to flash by using remote management software.

Hard Disk Drive LED

The disk LED located on the drive carrier indicates the following depending on the status:

Disk LED

Disk LED

3.5-inch hard disk drive   2.5-inch hard disk drive

- Flashing (green)

    The LED indicates that the hard disk drive is being accessed.

- On (amber)

    The LED indicates a failure of a hard disk drive mounted in the RAID system.

    > **NOTE:** Even if one (two in RAID6) of the hard disk drives fails in the
    > logical drive (RAID1, RAID5, RAID6, RAID10, RAID50), the server
    > can continue operating. However, replace the hard disk drive as soon as
    > possible, and perform reconstruction (rebuild) processing. (The failing
    > hard disk drive can be replaced in hot swap mode.)

- Blinking in green and amber alternately

    The LED indicates that reconstruction (rebuild) processing is being performed for the hard
    disk drive. (This flashing does not indicate a failure.) When a failing hard disk drive is
    replaced in RAID System, the system automatically rebuilds the data. (Auto-rebuild
    function) The LED switches back and forth between green and amber during rebuild
    processing.
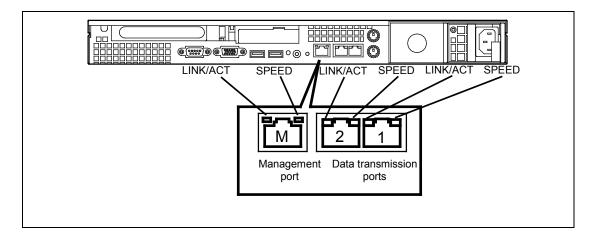
    The LED goes off when the rebuild processing has terminated. It turns amber when the
    rebuild processing fails.

IMPORTANT: If the server is turned off during rebuild processing, the processing is stopped. Restart the server, mount the new hard disk drive in hot swap mode, and then perform rebuild processing again. Observe the following notes on using the auto-rebuild function.

- Do not turn the power off or reboot the system during rebuild processing.

- Let 90 seconds or more pass between removing a failing hard disk drive and mounting a new one.

- Do not replace a failing hard disk drive while rebuild processing is being performed on another hard disk drive.

LAN Connector LEDs

There are two LEDs for each of the two LAN ports (connectors) on the rear panel.

- ■ LINK/ACT LEDs

    Each LINK/ACT LED indicates the status of the standard network port of the server. While power is supplied to the server and HUB and the connection is correct, the LED is on (green). The LED turns green and flashes while the network port is transmitting/receiving data.

    If the LED does not go on when the LINK state is placed, check if the network cable is in normal state and if it is connected correctly. If the LED does not go on yet when the network cable is normal, the network (LAN) controller may be faulty. In this case, contact your sales representative.

- ■ Speed LEDs (for data transmission ports)
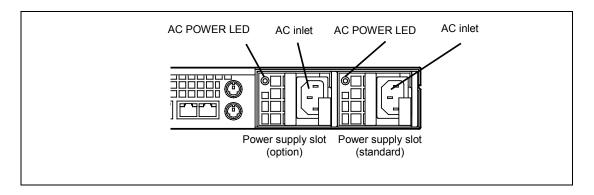
    This LED indicates whether each of the network ports normally equipped with the server is operated through the 1000BASE-T, 100BASE-TX or 10BASE-T network interface. If the LED is lit amber, the network port is operated through 1000BASE-T. If the LED is lit green, the network port is operated through 100BASE-TX. If the LED is off, the network port is operated through 10BASE-T.

- ■ Speed LED (for management port)

    This LED indicates whether each of the network ports normally equipped with the server is operated through the 100BASE-TX or 10BASE-T network interface. If the LED is lit green, the network port is operated through 100BASE-TX. If the LED is off, the network port is operated through 10BASE-T.

AC POWER LEDs

There is an AC POWER LED for the power supply unit on the rear.

The LED turns green and flashes when the power supply unit receives AC power from the power cord, which is connected to the AC inlet. (Flashing amber indicates no AC power is received in any one of two power supplies in the redundant configuration.)

The LED turns green when the server power switch is turned on. If the LED does not go on when the server power switch is turned on or if it turns amber, the power supply unit is probably faulty. In this case, contact your service representative to replace the power supply unit.

> **NOTE:** If one power supply unit fails while an optional power supply is mounted, the system can continue operating on the other power supply unit (redundancy function). The failing power supply unit can be replaced in hot swap mode (with the power on) without the system being stopped.

Error Messages

If an error occurs in the server, an error message appears on the display unit connected to the server.

POST Error Messages

When POST detects an error, it displays an error message on the display unit screen. In addition, depending on the error contents, the computer might beep to report that an error occurred.

Messages indicating a memory error (In this example, the messages indicate that CPU1_DIMM1 and CPU1_DIMM4 have failed and been disabled, and that CPU1_DIMM1 have been forcibly started up.)

```
:
System Monitoring Check
... Passed
ERROR
AE81: CPU1_DIMM1 with error is enabled.
AE01: CPU1_DIMM1 has been disabled.
AE04: CPU1_DIMM4 has been disabled.

Press <F1> to resume, <F2> to setup
```

The following table lists error messages and actions to take.

> **IMPORTANT:** Write down the messages displayed before contacting your service representative. Alarm messages are useful information for maintenance.

> **NOTE:**   The list of POST error messages only contains messages for the server. For details about the BIOS error messages for the SCSI controller card and RAID controller, which are options connected to the motherboard, and the actions to take, see the manuals that come with the options.

Error message after power-on

Displayed Error Message		Description	Recommended Action
8001	Real time clock error	Real-time clock error	Start up the BIOS setup utility, and then specify the correct date and time. If the same error continues to occur, contact your service representative.
8002	Check date and time settings	The real-time clock time setting is incorrect.	
8003	System battery is dead - Replace and run SETUP	There is no system battery.	Contact your service representative to request battery replacement. (After the replacement, start up the BIOS setup utility, and then specify the correct settings.)
8005	Previous boot incomplete - Default configuration used	The last time the system was started up, POST processing did not finish.	Use the BIOS setup utility to specify the correct settings.
8006	System configuration data cleared by Jumper.	The BIOS setup utility settings were cleared using the jumper.	Specify the BIOS setup utility settings again.
8007	SETUP Menu Password cleared by Jumper.	The BIOS setup utility menu password was cleared using the jumper.	Use the BIOS setup utility to specify another password.
8010	Graphics controller was not detected.	No graphics controller was detected.	Contact your service representative.
8800	DXE_NB_ERROR	An error was detected during chip set initialization.	
8801	DXE_NO_CON_IN	An error was detected during console initialization.	
8802	DXE_NO_CON_OUT		
8803	PEI_DXE_CORE_NOT_ FOUND	A Flash ROM failure was detected.	
8804	PEI_DXEIPL_NOT_FOU ND		
8805	DXE_ARCH_PROTOCO L_NOT_AVAILABLE		
8806	PEI_RESET_NOT_ AVAILABLE	The system was not reset correctly.	
8807	DXE_RESET_NOT_ AVAILABLE		

Displayed Error Message	Description	Recommended Action
8808 DXE_FLASH_UPDATE_FAILED	The Flash ROM was not written to correctly.	Contact your service representative.
8830 PEI_RECOVERY_NO_CAPSULE	The Flash ROM was not recovered correctly.	
8831 PEI_RECOVERY_PPI_NOT_FOUND		
8832 PEI_RECOVERY_FAILED		
9000 PEI_CPU_NO_MICROCODE	An unsupported CPU was detected.	
9001 Unsupported CPU detected on CPU #1		
9002 Unsupported CPU detected on CPU #2		
9021 Unsupported CPU Speed detected on CPU #1	A CPU running at an unsupported clock speed was detected.	
9022 Unsupported CPU Speed detected on CPU #2		
9040 PEI_CPU_SELF_TEST_FAILED	An error was detected during CPU initialization.	
9060 PEI_CPU_MISMATCH	Different CPUs are installed for CPU #1 and #2.	
9800 GENERIC_CPU_THERMAL_ERROR	A CPU temperature abnormality was detected.	
A001 Memory Error detected in CPU1_DIMM1	An error was detected for CPU1_DIMM1.	
A002 Memory Error detected in CPU1_DIMM2	An error was detected for CPU1_DIMM2.	
A003 Memory Error detected in CPU1_DIMM3	An error was detected for CPU1_DIMM3.	
A004 Memory Error detected in CPU1_DIMM4	An error was detected for CPU1_DIMM4.	
A005 Memory Error detected in CPU1_DIMM5	An error was detected for CPU1_DIMM5.	
A006 Memory Error detected in CPU1_DIMM6	An error was detected for CPU1_DIMM6.	
A007 Memory Error detected in CPU2_DIMM1	An error was detected for CPU2_DIMM1.	
A008 Memory Error detected in CPU2_DIMM2	An error was detected for CPU2_DIMM2.	
A009 Memory Error detected in CPU2_DIMM3	An error was detected for CPU2_DIMM3.	
A00A Memory Error detected in CPU2_DIMM4	An error was detected for CPU2_DIMM4.	
A00B Memory Error detected in CPU2_DIMM5	An error was detected for CPU2_DIMM5.	
A00C Memory Error detected in CPU2_DIMM6	An error was detected for CPU2_DIMM6.	

Displayed Error Message	Description	Recommended Action
AE01 CPU1_DIMM1 has been disabled.	A memory error was detected. CPU1_DIMM1 has been disabled.	Contact your service representative.
AE02 CPU1_DIMM2 has been disabled.	A memory error was detected. CPU1_DIMM2 has been disabled.	
AE03 CPU1_DIMM3 has been disabled.	A memory error was detected. CPU1_DIMM3 has been disabled.	
AE04 CPU1_DIMM4 has been disabled.	A memory error was detected. CPU1_DIMM4 has been disabled.	
AE05 CPU1_DIMM5 has been disabled.	A memory error was detected. CPU1_DIMM5 has been disabled.	
AE06 CPU1_DIMM6 has been disabled.	A memory error was detected. CPU1_DIMM6 has been disabled.	
AE07 CPU2_DIMM1 has been disabled.	A memory error was detected. CPU2_DIMM1 has been disabled.	
AE08 CPU2_DIMM2 has been disabled.	A memory error was detected. CPU2_DIMM2 has been disabled.	
AE09 CPU2_DIMM3 has been disabled.	A memory error was detected. CPU2_DIMM3 has been disabled.	
AE0A CPU2_DIMM4 has been disabled.	A memory error was detected. CPU2_DIMM4 has been disabled.	
AE0B CPU2_DIMM5 has been disabled.	A memory error was detected. CPU2_DIMM5 has been disabled.	
AE0C CPU2_DIMM6 has been disabled.	A memory error was detected. CPU2_DIMM6 has been disabled.	
AE81 CPU1_DIMM1 with error enabled.	CPU1_DIMM1 was disabled, but, because all memory is currently disabled, this DIMM was forcibly enabled.	
AE82 CPU1_DIMM2 with error enabled.	CPU1_DIMM2 was disabled, but, because all memory is currently disabled, this DIMM was forcibly enabled.	

Displayed Error Message	Description	Recommended Action
AE83 CPU1_DIMM3 with error enabled.	CPU1_DIMM3 was disabled, but, because all memory is currently disabled, this DIMM was forcibly enabled.	Contact your service representative.
AE87 CPU2_DIMM1 with error enabled.	CPU2_DIMM1 was disabled, but, because all memory is currently disabled, this DIMM was forcibly enabled.	
AE88 CPU2_DIMM2 with error enabled.	CPU2_DIMM2 was disabled, but, because all memory is currently disabled, this DIMM was forcibly enabled.	
AE89 CPU2_DIMM3 with error enabled.	CPU2_DIMM3 was disabled, but, because all memory is currently disabled, this DIMM was forcibly enabled.	
B000 DXE_LEGACY_OPROM_ NO_SPACE	There is no space for expanding option ROM.	If the board is not used as a boot device, disable the Option ROM Scan for that board.
B001 Expansion ROM not initialized - PCI Slot 1B	Option ROM expansion in PCI slot 1B failed.	
B004 Expansion ROM not initialized - PCI Slot 1C	Option ROM expansion in PCI slot 1C failed.	
B00A Expansion ROM not initialized - PCI Slot 0A	Option ROM expansion in PCI slot 0A failed.	
B030 PCI System Error on Bus/Device/Function	PCI SERR was detected.	Contact your service representative.
B040 PCI Parity Error on Bus/Device/Function	PCI PERR was detected.	
C010 The error occurred during temperature sensor reading	An error was detected while reading the temperature sensor.	
C011 System Temperature out of the range.	A temperature abnormality was detected.	It is possible that a fan has failed or is clogged up. Contact your service representative and request repairs.
C020 The error occurred during voltage sensor reading.	An error was detected while reading the voltage sensor.	Contact your service representative.

Displayed Error Message	Description	Recommended Action
C021 System Voltage out of the range.	A system voltage abnormality was detected.	Contact your service representative.
C040 SROM data read error	SROM data reading error	
C041 SROM data checksm bad	SROM data checksum error	
C060 SMBus device Error detected.	An error was detected for the SM Bus.	
C061 1st SMBus device Error detected.	An error was detected for the 1st SM Bus.	
C062 2nd SMBus device Error detected.	An error was detected for the 2nd SM Bus.	
C063 3rd SMBus device Error detected.	An error was detected for the 3rd SM Bus.	
C064 4th SMBus device Error detected.	An error was detected for the 4th SM Bus.	
C065 5th SMBus device Error detected.	An error was detected for the 5th SM Bus.	
C066 6th SMBus device Error detected.	An error was detected for the 6th SM Bus.	
C101 BMC Memory Test Failed.	BMC device (chip) error	Turn off the power, and then restart the server. If this does not resolve the problem, contact your service representative
C102 BMC Firmware Code Area CRC check failed.		
C103 BMC core hardware failure.		
C104 BMC IBF or OBF check failed.	Accessing the BMC address failed.	
C105 BMC SEL area full.	There is not enough capacity to write the system event log.	Start up the BIOS setup utility, select [Clear All Error Logs] under [Event Log Configuration] on the [Server] menu, and then press the **Enter** key to delete the logs.

Displayed Error Message	Description	Recommended Action
C106 BMC set in progress monitoring timeout.	The BMC check was interrupted.	Turn off the power, and then restart the server. If this does not resolve the problem, contact your service representative.
C107 BMC command access failed.	BMC command access failed.	
C108 Could not redirect the console - BMC Busy -	Console redirection was not possible (BMC busy).	
C109 Could not redirect the console - BMC Error -	Console redirection was not possible (BMC error).	
C10A Could not redirect the console - BMC Parameter Error -	Console redirection was not possible (BMC parameter error).	
C10B BMC Platform Information Area corrupted.	BMC device (chip) error	
C10C BMC update firmware corrupted.		
C10D Internal Use Area of BMC FRU corrupted.	Failure of the SROM for storing chassis information	This is not a fatal error, but turn off the power, and then restart the server. If this does not resolve the problem, contact your service representative.
C10E BMC SDR Repository empty.	BMC device (chip) error	Turn off the power, and then restart the server. If this does not resolve the problem, contact your service representative.
C10F IPMB signal lines do not respond.	SMC (Satellite Management Controller) failure	This is not a fatal error, but turn off the power, and then restart the server. If this does not resolve the problem, contact your service representative.
C110 BMC FRU device failure.	Failure of the SROM for storing chassis information	This is not a fatal error, but turn off the power, and then restart the server. If this does not resolve the problem, contact your service representative.

Displayed Error Message		Description	Recommended Action
C111	BMC SDR Repository failure.	Failure of the SROM for storing sensor data record information	Turn off the power, and then restart the server. If this does not resolve the problem, contact your service representative.
C112	BMC SEL device failure.	BMC device (chip) failure	
C113	BMC RAM test error.	BMC RAM error	
C114	BMC Fatal hardware error.	BMC error	
C115	Management controller not responding	BMC error	Upload the RMC firmware. If this does not resolve the problem, contact your service representative.
C116	Private I2C bus not responding.	Private I2C bus not responding	Turn off the power, and then restart the server. If this does not resolve the problem, contact your service representative.
C117	BMC internal exception	BMC error	
C118	BMC A/D timeout error.	BMC error	
C119	SDR repository corrupt.	BMC error or SDR data corruption	
C11A	SEL corrupt.	BMC error or system event log data corruption	
C200	The error occurred during memory configuration check.	The memory information could not be obtained.	
C201	Memory Configuration change is detected.	The memory configuration has changed since the previous startup.	This message appears if the configuration was changed since the previous startup. If this message appears even no configuration change has been made, contact your service representative.
C202	The error occurred during CPU configuration check.	The CPU information could not be obtained.	Turn off the power, and then restart the server. If this does not resolve the problem, contact your service representative.
C203	CPU Configuration change is detected.	The CPU configuration has changed since the previous startup.	This message appears if the configuration was changed since the previous startup. If this message appears even no configuration change has been made, contact your service representative.

Messages displayed by RAID Controller during POST

On-screen message	Action
Memory/battery problems were detected. The adapter has recovered, but cached data was lost. Press any key to continue, or 'C' to load the configuration utility.	Contact your service representative.
Firmware version inconsistency was detected. The adapter has recovered, but cached data was lost. Press any key to continue, or 'C' to load the configuration utility.	Contact your service representative.
Foreign configuration(s) found on adapter Press any key to continue, or 'C' to load the configuration utility.	Press **C** to run the utility to import or clear configuration.
Previous configuration cleared or missing Importing configuration created on MM/DD hh:mm Press any key to continue, or 'C' to load the configuration utility.	Contact your service representative.
An enclosure was found that contains both SAS and SATA drives, but this controller does not allow mixed drive types in a single enclosure. Please correct the problem then restart your system. Press any key to continue, or 'C' to load the configuration utility.	RAID Controller may be faulty. Contact your service representative to replace the RAID controller.
SAS drives were detected, but this controller does not support SAS drives. Please remove the SAS drives then restart your system. Press any key to continue, or 'C' to load the configuration utility.	RAID Controller may be faulty. Contact your service representative to replace the RAID controller.
SATA drives were detected, but this controller does not support SATA drives. Please remove the SATA drives then restart your system. Press any key to continue, or 'C' to load the configuration utility.	RAID Controller may be faulty. Contact your service representative to replace the RAID controller.
Invalid SAS topology detected. Please check your cable configurations, repair the problem, and restart your system.	Check if cable is connected properly. If the same error persists, contact your service representative.
The battery hardware is missing or malfunctioning, or the battery is unplugged. If you continue to boot the system, the battery-backed cache will not function. Please contact technical support for assistance. Press 'D' to disable this warning (if your controller does not have a battery).	<When battery is not used> Press **D** to hide this message. <When battery is used> Check if battery is connected properly. If the same error persists, contact your service representative.

On-screen message	Action

Your VDs that are configured for write-back are temporarily running in write-through mode.
This is caused by the battery being charged, missing, or bad.
Please allow battery to charge for 24 hours before evaluating battery for replacement.
The following VDs are affected :XX
Press any key to continue.
	\<When battery is not used\>
	Ignore this message.
	
	\<When battery is used\>
	Run WebBIOS or Universal RAID Utility to check if battery is detected.
	• Battery is not detected:
	  – Check if battery is connected properly.
	  – Battery may be insufficiently charged. Halt the system for 24 hours or longer and charge battery.
	• Battery is detected:
	  – Halt the system for 9 hours or longer and charge battery.
	If the same error persists, contact your service representative.

Invalid SAS Address present in MFC data. Please program valid SAS Address, and restart your system.	Contact your service representative.
Some configured disks have been removed from your system, or are no longer accessible. Please check your cables and also ensure all disks are present. Press any key to continue, or 'C' to load the configuration utility.	Check if cable and hard disk drives are connected properly. If the same error persists, contact your service representative.
The following VDs have missing disks: xx If you proceed (or load the configuration utility), these VDs will be marked OFFLINE and will be inaccessible. Please check your cables and ensure all disks are present. Press any key to continue, or 'C' to load the configuration utility.	
The following VDs are missing: xx If you proceed (or load the configuration utility), these VDs will be removed from your configuration. If you wish to use them at a later time, they will have to be imported. If you believe these VDs should be present, please power off your system and check your cables to ensure all disks are present. Press any key to continue, or 'C' to load the configuration utility.	
All of the disks from your previous configuration are gone. If this is an unexpected message, then please power off your system and check your cables to ensure all disks are present. Press any key to continue, or 'C' to load the configuration utility.	

On-screen message	Action
The cache contains dirty data, but some VDs are missing or will go offline, so the cached data can not be written to disk. If this is an unexpected error, then please power off your system and check your cables to ensure all disks are present. If you continue, the data in cache will be permanently discarded. Press 'X' to acknowledge and permanently destroy the cached data.	Check if cable, hard disk drives, and upgrade kit are connected properly. If the same error persists, contact your service representative. NOTE: If you press **X**, the data in cache memory will be lost.
Invalid memory configuration detected. Please contact your system support. System has halted.	Contact your service representative to replace the RAID controller.
RAID Adapter FW Failed Validation!!! Adapter needs to be refreshed. Press any key to continue.	Contact your service representative to replace the RAID controller.
Cache data was lost due to an unexpected power-off or reboot during a write operation, but the adapter has recovered. This could be due to memory problems, bad battery, or you may not have a battery installed. Press any key to continue or 'C' to load the configuration utility.	<When battery is not used> Run WebBIOS or Universal RAID Utility to check the setting for cache mode. If forced write-back is specified, change it to constant write back or write through mode. <When battery is used> Check if battery is connected properly. If the same error persists, contact your service representative to replace the RAID Controller and battery.
Entering the configuration utility in this state will result in drive configuration changes. Press 'Y' to continue loading the configuration utility or please power off your system and check your cables to ensure all disks are present and reboot.	Contact your service representative to replace the RAID controller.
Multibit ECC errors were detected on the controller. DIMM on the controller needs replacement. If you continue, data corruption can occur. Press 'X' to continue or else power off the system and replace the DIMM module and reboot. If you have replaced the DIMM please press 'X' to continue.	Contact your service representative to replace the RAID controller.
Multiple Single-bit ECC errors were detected during the previous boot of the controller. DIMM on the controller needs replacement. If you continue, data corruption can occur. Press 'X' to continue or else power off the system and replace the DIMM module and reboot. If you have replaced the DIMM please press 'X' to continue.	Contact your service representative to replace the RAID controller.

On-screen message	Action
Single-bit overflow ECC errors were detected during the previous boot of the controller. DIMM on the controller needs replacement. If you continue, data corruption can occur. Press 'X' to continue or else power off the system and replace the DIMM module and reboot. If you have replaced the DIMM please press 'X' to continue.	Contact your service representative to replace the RAID controller.

Beep Codes

If an error occurs during the POST, the server beeps, indicating the type of error.

Each number indicates the number of short beeps, and a hyphen indicates a pause. For example, the beep interval 1-3-3-1 indicates 1 beep, a pause, 3 beeps, a pause, 3 beeps, a pause, and 1 beep, which indicates that an error occurred while checking the memory capacity.
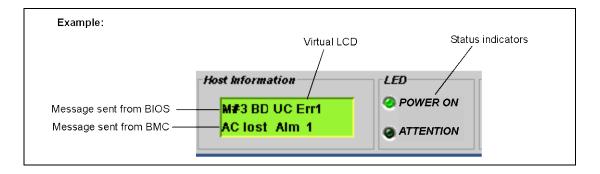
Beep code	Description	Recommended action
1-3-3-1	No memory could be detected. An error occurred during a memory capacity check. An unsupported CPU may be installed.	Make sure that the DIMMs are correctly inserted. If this does not resolve the problem, contact your service representative and request DIMM, CPU, or motherboard replacement.
1-1	No graphics controller could be detected.	Contact your service representative and request motherboard replacement.
1	An error was detected during the POST processing or DIMM has already been installed.	Contact your service representative and request motherboard replacement.
3	Failed to read the BIOS executable module. Or, BIOS has no executable module.	
4	Failed to initialize the BIOS executable module.	
7	Failed to reset the system.	

Error messages on virtual LCD

NEC EXPRESSSCOPE Engine 2 (Remote Management Controller), which is on your server board, allows you to monitor the server status from a Web browser running on a client PC via a network.

The virtual LCD (16 digits x 2 lines) in the "Host Information" area displays the POST codes and status message.

When POST detects an error, the POST error code is displayed on the virtual LCD upon completion of POST. See the table for POST error codes for details.

● **Messages displayed on top line (BIOS messages)**

On-screen message	Description	Action
XX BIOS Rev YYYY	POST in progress. XX: POST code, YYYY: BIOS version	Wait until POST completes.
Prepare To Boot	POST completes normally.	Wait until booting up completes.
CPU1_DIMM C-Err	A correctable error occurred on one of CPU1_DIMMs.	The error was corrected. You may continue operating the server.
CPU2_DIMM C-Err	A correctable error occurred on one of CPU2_DIMMs.	
Mem Err Disable	A correctable memory error frequently occurred.	Contact your service representative.
Mem Reconfigured	The system is running with memory degraded.	
PCI Bus SERR XX	A SERR has occurred in the PCI bus XX.	
PCI Bus PERR XX	A PERR has occurred in the PCI bus XX.	

● **Messages displayed on bottom line (BMC messages)**

On-screen message	Description	Action
Proc1 VccpAlm XX	A voltage abnormality was detected. XX = 09: Upper limit abnormality XX = 02: Lower limit abnormality A voltage abnormality at the warning level was detected: XX = 07: Upper limit warning XX = 00: Lower limit warning	Contact your service representative.
Proc2 VccpAlm XX		
Proc1PVtt Alm XX		
Proc2PVtt Alm XX		
Proc1 1.5v Alm XX		
Proc2 1.5v Alm XX		
BB 1.0vsb Alm XX		
BB 1.1v Alm XX		
BB 1.2vsb Alm XX		
BB +1.5v Alm XX		
BB +1.8v Alm XX		
BB 1.8vsb Alm XX		
BB +3.3v Alm XX		
BB 3.3vsb Alm XX		
BB +5.0v Alm XX		
BB 5vsb Alm XX		
BB +12v Alm XX		
VBAT Alm XX		
BB Temp1 Alm XX	A temperature abnormality was detected. XX = 09: High temperature abnormality XX = 02: Low temperature abnormality A temperature abnormality at the warning level was detected: XX = 07: High temperature warning XX = 00: Low temperature warning	It is possible that a fan has failed or is clogged up. Contact your service representative and request repairs.
FP Temp Alm XX		
Proc1 Therm % XX		
Proc2 Therm % XX		
CPU1_DIMM1 Temp XX		
CPU1_DIMM2 Temp XX		
CPU1_DIMM3 Temp XX		
CPU1_DIMM4 Temp XX		
CPU1_DIMM5 Temp XX		
CPU1_DIMM6 Temp XX		
CPU2_DIMM1 Temp XX		
CPU2_DIMM2 Temp XX		
CPU2_DIMM3 Temp XX		
CPU2_DIMM4 Temp XX		
CPU2_DIMM5 Temp XX		
CPU2_DIMM6 Temp XX		
DUMP Request !	The dump button was pressed.	Wait until collecting the memory dump data has finished.
OS shutdown Alm	An OS stop error was detected.	Record the displayed message, wait until collecting the memory dump data has finished, and then contact your service representative and request repairs.
Power Unit 1 Alm	A power supply unit 1 abnormality occurred.	Make sure that the power cord is plugged in. If this does not resolve the problem, contact your service representative and request repairs.
Power Unit 2 Alm	A power supply unit 2 abnormality occurred.	
Proc Missing	No CPU is installed.	Contact your service representative and request CPU or motherboard replacement.

On-screen message	Description	Action
Proc1 T-Trip	The power was forcibly turned off due to a CPU1 temperature abnormality.	Contact your service representative.
Proc2 T-Trip	The power was forcibly turned off due to a CPU2 temperature abnormality.	
ChipSet T-Trip	The power was forcibly turned off due to a chip set temperature abnormality.	
CPU1_DIMM U-Err	An unrecoverable error occurred for a CPU1 DIMM.	
CPU2_DIMM U-Err	An unrecoverable error occurred for a CPU2 DIMM.	
Processor1 IERR	An internal CPU1 error (IERR) occurred.	
Processor2 IERR	An internal CPU2 error (IERR) occurred.	
SMI timeout	A timeout occurred while servicing system management interrupts.	
WDT timeout	A watchdog timer timeout occurred.	
HDD 1 Fault	Operation was performed while the hard disk drive had a failed status (supported only when the onboard RAID Controller (LSI Embedded MegaRAID^{TM}) is used). HDD 4 Fault to HDD 6 Fault only apply to 2.5-inch hard disk drive models.	
HDD 2 Fault		
HDD 3 Fault		
HDD 4 Fault		
HDD 5 Fault		
HDD 6 Fault		
Sys Fan 1R Alarm	A fan alarm was detected.	It is possible that a fan has failed or is clogged up. Contact your service representative and request repairs.
Sys Fan 2R Alarm		
Sys Fan 3R Alarm		
Sys Fan 4R Alarm		
Sys Fan 5R Alarm		
Sys Fan 6R Alarm		
Sys Fan 7R Alarm		
Sys Fan 1F Alarm		
Sys Fan 2F Alarm		
Sys Fan 3F Alarm		
Sys Fan 4F Alarm		
Sys Fan 5F Alarm		
Sys Fan 6F Alarm		
Sys Fan 7F Alarm		

SOLVING PROBLEMS

When the server fails to operate as expected, see the following to find out your problem and follow the instruction given 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 service representative.

Problems with NEC Express Server

No screen display appears and beep occurs:

- ❑ Is the DIMM board installed securely?

  → Check whether the DIMM board is inserted into the mating connector securely.

  → Make sure the jumper switches have been returned to their original positions after CMOS clearing. See "Configuring Mother Board Jumpers" in Chapter 4 for the positions of the jumper switches.

Fail to power on the server:

- ❑ Is the server is 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 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 outputs 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: [Advanced] - [AC-LINK]>

- ❑ Did you press the POWER/SLEEP switch?

  → Press the POWER/SLEEP switch on the front of the server to turn on the power (the POWER/SLEEP lamp lights).

POST fails to complete:

❑ Is the DIMM board installed?

→ Check the installation location of DIMMs (see Chapter 9).

❑ Is the memory size large?

→ The memory check may take a few seconds 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 contains appropriate memory boards or PCI devices?

→ Operation of the server with unauthorized devices is not guaranteed.

Fail to access to internal or external devices (or such devices fail to operate):

❑ 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 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 BIOS configuration correct?

→ Some devices connected to the serial or parallel port may require I/O port address or operation mode settings. Refer to the manual that comes with the board for details to make correct settings.

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.

  - → The keyboard or mouse does not operate if it is connected when the server is powered (not applicable to USB devices). Power of the server first and connect it properly.

- ❑ Are the server 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's 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.

Fail to access to the DVD/CD-ROM:

- ❑ Is the DVD/CD-ROM properly set in the optical disk drive tray?

  - → The tray is provided with a holder to secure the DVD/CD-ROM. Make sure that the DVD/CD-ROM is placed properly in the holder.

- ❑ Is the DVD/CD-ROM applicable to the server?

  - → The DVD/CD-ROM for Macintosh is not available for use.

  - → For the disk which does not conform to the CD standard, the playback of such a disk with the optical disk drive is not guaranteed.

The POWER/SLEEP lamp goes on when the power cord is connected:

  - → When the server receives an AC power after the power cord is connected, the POWER/SLEEP lamp goes on. This is a normal operation of the server, not a fault. The lamp will go off when DC power is turned on, and then off.

Inserted the correct DVD/CD-ROM but the message like the following is displayed:

```
The DVD/CD-ROM is not inserted or the wrong DVD/CD-ROM is inserted.
Please insert the correct DVD/CD-ROM.
OK
```

- ❑ Is the data side of the DVD/CD-ROM dirty or injured?

  - → Take the DVD/CD-ROM out of the optical disk drive, confirm that it is not dirty or injured, reset and click [OK].

Fail to access the hard disk drive:

(Refer to the documentation supplied with the RAID Controller.)

❑ Is the hard disk drive applicable to the server?

→ Operation of any device that is not authorized by NEC is not guaranteed.

❑ Is the hard disk drive properly installed?

→ See Chapter 9.

Fail to access the (internal or external) SCSI devices:

❑ Is the SCSI device applicable to the server?

→ Operation of any SCSI device that is not authorized by NEC is not guaranteed.

❑ Is the cable connection changed?

→ See Chapter 10 for cable connection.

❑ Are SCSI devices properly configured?

→ When the server has external SCSI devices connected, hard disk drive settings, including SCSI ID and terminator, are required. Refer to the manual that comes with the SCSI device for details.

❑ Is cable length exceeded?

→ Refer to the manual that comes with the SCSI device for details.

❑ Are the optional SCSI controllers properly configured?

→ Use the BIOS Setup utility for proper configuration of SCSI devices connected to the SCSI connector on the mother board. When the server has an optional SCSI controller installed and SCSI devices connected to it, use the BIOS Setup utility that comes with the optional SCSI controller for proper configuration. See the manual that comes with the optional SCSI controller for details.

Event logs in using Intel Network adapter teaming

Event Type: Warning
Event Source: iANSMiniport
Event Category: None
Event ID: 11
Description: Adapter link down:Intel(R) ----

Event Type: Warning
Event Source: iANSMiniport
Event Category: None
Event ID: 13
Description: Intel(R) ---- has been deactivated from the team.

Event Type: Error
Event Source: iANSMiniport
Event Category: None
Event ID: 16
Description: Team Name : The last adapter has lost link.
Team network connection has been lost.

Event Type: Warning
Event Source: iANSMiniport
Event Category: None
Event ID: 22
Description: Primary Adapter does not sense any Probes:
Intel(R) ---- Possible reason: partitioned Team.

→ Above-mentioned event log will appear when the system starts.

There is no problem in LAN driver operation.

Problems with Windows

The following warnings are logged when you start Windows Server 2008 R2:

Event ID:	27
Source:	e1qexpress
Level:	Warning
Description:	Intel(R) 82576 Gigabit Dual Port Server Network ... Network link has been disconnected.

→ If the above event is logged when you start the system, this event does not affect system operation. Ignore this message.

Event ID:	63
Source:	Microsoft-Windows-WMI
Level:	Warning
Description:	A provider, Ncs2, has been registered in the Windows Management Instrumentation namespace Root\IntelNCS2 to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.

→ This event does not affect system operation. Ignore this message.

The following system event is logged when Windows Server 2008 R2 is installed:

Event ID:	134
Source:	Microsoft-Windows-Time-Service
Level:	Warning
Description:	NtpClient was unable to set a manual peer to use as a time source because of DNS resolution error on ''. NtpClient will try again in 3473457 minutes and double the reattempt interval thereafter. The error was: No such host is known. (0x80072AF9)

→ This event does not affect system operation. Ignore this message.

The following application event is logged when Windows Server 2008 R2 is installed:

Event ID: 1534

Source: Microsoft-Windows-User Profiles Service

Level: Warning

Description: Profile notification of event Create for component
                {56EA1054-1959-467f-BE3B-A2A787C4B6EA} failed, error code is The
                revision level is unknown.

    → This event does not affect system operation. Ignore this message.

The following system event is logged when I use the system:

Event ID: 1

Source: iScsiPrt

Level: Error

Description: Initiator failed to connect to the target. Target IP address and TCP Port
                number are given in dump data.

    → Go to the Microsoft website:
       http://support.microsoft.com/default.aspx/kb/976072/en-us

The following warnings are logged to application event log when you import a transportable shadow-copy to another server that has a read-only volume while operating Windows Server 2008 R2:

Event ID: 8193

Source: VSS

Level: Error

Description: Volume Shadow Copy Service error: Unexpected error calling routine
                IOCTL_DISK_GET_DRIVE_LAYOUT_EX(\\?\mpio#disk&ven_nec&pro
                d_istorage_2000&rev_2800#1&7f6ac24&0&30303030303030393331303
                03037353730303323934#{ *GUID* }) - BuildLunInfoForDrive.
                hr = 0x80070013, This media is write-protected.

Event ID: 12289

Source: VSS

Level: Error

Description: Volume Shadow Copy Service error: Unexpected error
                DeviceIoControl(\\?\storage#volume#{ *GUID* }#0000000000010000#
                { *GUID* } - 00000000000002B8,0x00560000,0000000000000000,0,
                00000000002BE0C0,4096,[0]).
                hr = 0x80070013, This media is write-protected.

    → Go to the Microsoft website:
       http://support.microsoft.com/kb/2003016/en-us

The following warnings are logged to application event log when I import a transportable shadow-copy to another server that has a floppy disk drive while operating Windows Server 2008 R2:

Event ID: 12289

Source: VSS

Level: Error

Description: Volume shadow copy service error: unexpected error

DeviceIoControl (\\? # 6 \usbstor#sfloppy &ven_teac&prod_fd-05pub &rev_3000 & 158e20d0 & 0 # { *GUID* }-00000000000002B8, 0x00560000, 0000000000000000, 0, 0000000000327C70,4096, [0]). HR = 0x80070032, this request is not supported.

$\rightarrow$ Go to the Microsoft website:
    http://support.microsoft.com/kb/2003968/en-us

There is the case that the following message is displayed at the time of shutdown when you executes "Updating the system" in Windows Server 2008 R2:

1 program still needs to close: (Waiting for) Task Host Window

$\rightarrow$ This event does not affect system operation.
    Ignore this message. For more details, see
    http://support.microsoft.com/kb/975777/en-us

The following system events are logged when Windows Server 2008 is installed:

Event ID: 134

Source: Microsoft-Windows-Time-Service

Level: Warning

Description: NtpClient was unable to set a manual peer to use as a time source because of DNS resolution error on 'time.windows.com,0x9'. NtpClient will try again in 15 minutes and double the reattempt interval thereafter. The error was: No such host is known. (0x80072AF9)

Event ID: 263

Source: PlugPlayManager

Level: Warning

Description: The service 'ShellHWDetection' may not have unregistered for device event notifications before it was stopped.

Event ID: 7000

Source: Service Control Manager

Level: Error

Description: The Parallel port driver service failed to start due to the following error: The service cannot be started, either because it is disabled or because it has no enabled devices associated with it.

Event ID: 15016
Source: Microsoft-Windows-Http
Level: Error
Description: Unable to initialize the security package Kerberos for server side authentication. The data field contains the error number.

→ These events do not affect system operation. Ignore these messages.

The following application events are logged when Windows Server 2008 is installed:

Event ID: 63
Source: Microsoft-Windows-WMI
Level: Warning
Description: A provider, Ncs2, has been registered in the Windows Management Instrumentation namespace Root\cimv2 to use the LocalSystem account.

This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.

A provider, IntelEthernetDiag, has been registered in the Windows Management Instrumentation namespace Root\CIMv2 to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.

A provider, WmiPerfClass, has been registered in the Windows Management Instrumentation namespace root\cimv2 to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.

Event ID: 6000
Source: Microsoft-Windows-Winlogon
Level: Warning
Description: The winlogon notification subscriber <GPClient> was unavailable to handle a notification event.

Event ID: 6001
Source: Microsoft-Windows-Winlogon
Level: Warning
Description: The winlogon notification subscriber <GPClient> failed a notification event.

→ These events do not affect system operation. Ignore these messages.

The following system event is logged when Windows Server 2008 is installed:

Event ID: 10
Source: VDS Dynamic Provider
Description: The provider failed while storing notifications from the driver.
               The Virtual Disk Service should be restarted. hr=80042505

→ Go to the Microsoft website:
  http://support.microsoft.com/kb/948275/en-us/

The following application events are logged when Windows Server 2008 is installed:

Event ID: 1021
Source: Microsoft-Windows-Security-Licensing-SLC
Level: Warning
Description: SLUINotify service has failed to start. hr=0x80070424

Event ID: 1534
Source: Microsoft-Windows-User Profiles Service
Level: Warning
Description: Profile notification of event Create for component
               {56EA1054-1959-467f-BE3B-A2A787C4B6EA} failed, error code is
               -2147023591.

→ These events do not affect system operation. Ignore these messages.

There are some cases that an event log is registered as follows when you install Windows Server 2003 x64 Editions:

Source: DCOM
Category: Error
Event ID: 10016
Description: The application-specific permission settings do not grant Local Activation
               permission for the COM server application with CLSID
               {555F3418-D99E-4E51-800A-6E89CFD8B1D7} to the user {NT
               AUTHORITY\LOCAL SERVICE} SID {S-1-5-19}.
               This security permission can be modified using the component Services
               administrative tool.

→ It is not a problem in operating the system.

There are some cases that an event log is registered as follows when you install Windows Server 2003 x64 Editions:

Event Source: Service Control Manager
Event Type: Error
Event ID: 7011
Description: Timeout (30000 milliseconds) waiting for a transaction response from the
               IMAP4Svc service.

→ When this event is not registered by restarting the system, it is not a problem in
  operating the system.

Installed Service Pack before application of Windows Server 2003 R2 DISC 2 during Windows Server 2003 R2 installation:

→ Apply Windows Server 2003 R2 DISC 2, and then install Service Pack again by "Updating the System".

There are some cases that an event log is registered as follows when you operate Windows Server 2003 R2:

Source: IPMIDRV

Type: Error

Event ID: 1001

Description: The IPMI device driver attempted to determine if the system supported an IPMI BMC device. The driver attempted to detect the presence of the IPMI BMC by searching the SMBIOS for Type 38 record. But either no record was found or the record was not compatible with the version of the device driver.
If a SMBIOS Type 38 record was detected, the Dump Data field of the event contains a binary representation of the record.

→ If you use "Hardware Management" which is provided by Windows Server 2003 R2, above-shown event log will be registered.

For more details, refer to "Enabling Microsoft Windows Server 2003 R2 Hardware Management" on the following site.

[NEC Express5800 Web Site]

http://www.nec.co.jp/express/download/W2K3_R2

The system displays the message below and fails to log on:

```
Windows Product Activation

    This copy of Windows must be activated with Microsoft before you can
    continue. You cannot log on until you activate Windows.

    To shut down the computer, click Cancel.

           [  YES  ]        [  NO  ]         [ Cancel ]
```

→ In Windows Server 2003, the above message will be displayed if you use the operating system without executing the license authentication. Select "Yes", and execute the procedure for license authentication.

Cannot install the operating system correctly:

❑ Did you confirm the notes on installing the operating system?

→ See Chapter 6.

Fail to start the OS with the /3GB switch

→ System often fails to start the OS with the /3GB switch.

In this case, please adjust the capacity of the user mode area using the /userva switch in reference to the following URL.

http://support.microsoft.com/kb/316739/en

During installation, the following warning is registered in the System Log of the Event Viewer:

Error detected on the device \Device\CdRom0
during the paging operation.

→ There is no problem on this issue.

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-ROM in the optical disk drive?

→ Take out the NEC EXPRESSBUILDER DVD-ROM and restart the server.

❑ Is the OS broken?

→ Use recovery process to recover the system.

The OS presents unstable operation:

❑ Did you update the system?

→ Installing a network drive after installation of the OS may cause unstable operation. Use the NEC EXPRESSBUILDER DVD-ROM to update the system. (See Chapter 6.)

The system does not restart automatically when a stop error occurs, though the system is adjusted to automatically restarting:

→ When the system does not restart automatically, restart it manually.

The system restarts automatically when a stop error occurs, though the system is NOT adjusted to automatically restarting:

→ There is no problem about this issue.
Check the System Event Log to confirm that STOP error occurred.

Cannot turn the power OFF at the blue screen:

→ If you want to turn off the power at the blue screen, execute forced shutdown (forced shutdown: continue to press POWER/SLEEP switch for 4 seconds). The power will not be turned off if you press the switch for less than 3 seconds.

The PXE boot (network boot) fails or the server is not found on the network:

❑ Is the cable connected properly?

→ Connect the proper cable to the network port on the rear of the Express server. In addition, make sure that the used cable conforms to the network interface standard.

❑ Is BIOS configuration correct?

→ The internal LAN controller may be disabled with the BIOS SETUP utility of the server. Check the setting with the BIOS setup utility.

❑ 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?

→ Open the network property dialog box in control panel to specify the link speed and duplex value the same as the value specified for HUB.

The Telnet Service is not installed:

→ Adjust the computer name to 14 characters or less, and then install the Telnet Service according to <How to install the Telnet Service>.

<How to install the Telnet Service>

1. Click [Run] on Start menu.

2. Type "tlntsvr /service" in the [Open] box, and click [OK].

3. Click Start menu, point to [Control Panel] and click [Computer Management] and then click the [Services] to specify whether the Telnet Service is registered.

* When the installation of Telnet Service is finished, there is no problem if the computer name is set to 15 characters or more.

Power ON/OFF (Wake On LAN) feature does not work:

→ Immediately after the AC power is turned on, the Remote Power ON/OFF feature
(Wake ON LAN) is disabled. Start Windows Server 2003 once, provide settings as
shown below, then shutdown the system. After restart, the Remote Power On/Off
feature is available unless the AC power is turned off.
Select [Start] → [Administrative Tools] → [Computer Management].
Select Device Manager, double-click [Intel(R) PRO/1000EB Network Connection
with I/O Acceleration #n] under Network Adapter, and specify as follows in
[Detail] tab.

PME: [ON]

Wake On: [Magic Packet]

The system time lags:

→ In Windows Server 2008, If you do not use the server that adjust time such as NTP
(Network Time Protocol) Server, the system time may differ from actual time.
In this case, use NTP server or disable "Windows Time Service".

Problems with RAID System Configuration

Fail to install the OS:

❑   Did you create a configuration file?

→ Create a configuration file by using the configuration utility.

Fail to start the OS:

❑   Is RAID Controller inserted firmly straight into the PCI slot?

→ Install the RAID Controller properly.

❑   Is the RAID Controller installed in the proper slot?

→ Check if the slot is appropriate to the RAID controller. If the same error persists, the RAID Controller may be faulty. Contact your service representative.

❑   Are hard disk drives properly installed?

→ Install them properly.

❑   Is SAS cable connected correctly? (Check connection status with the server, hard disk drives, and additional disk cage.)

→ Connect the SAS cable properly.

If the same error persists, the hard disk drive may be faulty. Contact your service representative.

A hard disk drive fails:

→ Contact your service representative.

Rebuild fails:

❑   Is the capacity of the hard disk drive to be rebuilt sufficient?

→ The hard disk drive to be rebuilt should have the same capacity of the failed had disk drive.

❑   Is RAID0 configured for virtual disk?

→ RAID0 has no data redundancy, therefore, Rebuild is disabled in the RAID0 configuration. Replace the failed hard disk drive, then create the virtual disk again.

Check Consistency fails:

❑   Is virtual disk "Degraded"?

→ Replace the failed hard disk drive with new one, then perform Rebuild.

❑   Is RAID0 configured for virtual disk?

→ RAID0 has no data redundancy, therefore, Check Consistency is disabled in the RAID0 configuration.

Cannot set Write-Back for cache mode:

→ The current cache mode of RAID Controller is displayed on [Virtual Disks] - [Properties] - [Policies] - "Write". If additional battery is faulty, is not connected, or insufficiently charged, the cache mode is changed to "WThru (Write Through)" even if you specify "WBack (Write Back)". See Chapter 4 for details.

Event ID129:

The following message appears on Windows Event Log.

Source: msas2k3
Event ID: 129
Type: Warning
Description: Information about Event ID (129) (Source: msas2k3) is not found.

→ Retry by OS has succeeded. It is not the problem in operating the system.

Physical device is not correctly displayed on Universal RAID Utility:

→ If you use LSI Embedded MegaRAID™, a part of information on a physical device is not correctly displayed on Universal RAID Utility. It is no problem.

Event ID317:

The following message may be registered in RAID log in Universal RAID Utility and OS log (Event Log or Windows, syslog of Linux).

Source: Raidsrv
Event ID: 317 (8000013D)
Type: Warning
Description: <RU0317>[CTRL: %1 PD:%2(%3) %4 %5] An error of warning level
                 occurred on physical device.
                 Error code: %6

→ Single-shot message indicates the successful retry even if the message above is registered. If this message is repeatedly registered, physical device may be faulty. Contact your service representative.

Access LED flashes:

❑   Access LED flashes frequently even while the hard disk drive is not accessed.

→ The Access LED flashes if Patrol Read is running. With SATA hard disk drive, the LED may stay on.

Problems with NEC EXPRESSBUILDER

When the server is not booted from the NEC EXPRESSBUILDER DVD-ROM, check the following:

❑ Did you set the NEC EXPRESSBUILDER during POST and restart the server?

→ If you do not set the NEC EXPRESSBUILDER 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]>

❑ Is the connected Flash FDD or inserted floppy disk formatted?

→ Make sure that the Windows recognizes that the connected Flash FDD or inserted floppy disk is formatted. If not, format it.

❑ If [Os installation ***default***] 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 message listed in the table below.

Message	Cause
This EXPRESSBUILDER version was not designed for this computer. Insert the correct version and click [OK]. (When you click [OK], the computer reboots.)	This NEC EXPRESSBUILDER version is 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 NEC EXPRESSBUILDER could not find system-specific information because of mother board exchange and so on.
The hardware parameters written in this motherboard are incorrect. This version is not designed for this computer or the motherboard may be broken.	

❑   If the creation of the OEM-Disk for Windows failed, the following message will be displayed.
Confirm the message, and then try the solution described in the "Cause".

Error message	Cause
The format went wrong. It is write-protected or the floppy disk may be damaged.	The Flash FDD or the floppy disk is write-protected.
Please check a floppy disk and perform creation of OEM-Disk again.	Cancel write-protected state. If you have already cancelled
Failed in the deletion of the file. Please confirm whether the media is not write-protected state or not.	write-protected state, connect the USB floppy disk drive again.

Problems with Express Setup

Specified to join the Domain, but the system is installed as Workgroup:

$\rightarrow$ When the setup fails to join the Domain during the installation, it will install the system as Workgroup. Open [System] in Control Panel to specify joining the Domain.

Unable to specify the details of Network adapter:

$\rightarrow$ In Express Setup, you can not specify the details of Network adapter. Specify them from Control Panel after starting Windows.

There is unused area on the lead of hard disk drive:

❑ Did you install Windows Server 2003?

$\rightarrow$ If you had installed Windows Server 2003 by Express Setup, the head 8MB of hard disk drive may be unused area.

It is not a problem in operating the system.

Product key was not asked:

❑ Case of Windows Server 2008

$\rightarrow$ If you install using BackUp DVD-ROM, product key is not required.

If you install using the DVD-ROM other than BackUp DVD-ROM, product key screen is displayed twice, at "during OS installation" and "before [MICROSOFT SOFTWARE LICENSE TERMS] dialog, which displayed after OS installation".

Enter product key following the message.

❑ Case of Windows Server 2003

$\rightarrow$ If you install using BackUp CD-ROM, product key is not required.

If you install using the DVD-ROM other than BackUp DVD-ROM, product key screen is displayed during OS installation.

Enter Product Key following the message.

When IIS is installed with Windows Server 2008 by Express Setup, following feature is installed:

❑ Windows Process Activation Service

– Process Model
– Configuration APIs

❑ Remote Server Administration Tool

– Role Administration Tools
– Web Server (IIS) Tools

$\rightarrow$ The feature listed above is activated because they are required for the installation of IIS basic feature.

Problems with Parameter File Creator

Fail to start Parameter File Creator:

❑ Parameter File Creator requires to run by "Microsoft® HTML Application host".

→ If Parameter File Creator does not start, associate the file type with "Microsoft® HTML Application host" via following process.

1) Click [Run] on Start menu.

2) Type "%windir%\system32\mshta.exe /register" in the [Open] box, and click [OK].

Problems with N8190-127/131/153/154 FibreChannel Controller

When N8190-127/131/153/154 is used, the names of the Fibre Channel controllers may appear with different names on Device Manager:

→ It is not a problem in operating the system. To display correct controller name, run following command in the driver software NEC EXPRESSBUILDER DVD and restart the system.

[Windows Server 2008 R2/Windows Server 2008 32-bit (x86) / Windows Server 2008 64-bit (x64)]

<Drive Letter>:\017\win\winnt\ws2008x64\elxstor\friendlyname.exe

Problems with Autorun Menu

Cannot read documents:

❑ Do you have Adobe Reader installed correctly in your system?

→ Some 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 SP2 (or later)?

→ With Windows XP SP2 (or later), 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 Server 2003 or later?

→ The Autorun menu is supported by Windows XP/Windows Server 2003 or later.

→ If your system runs on Windows 2000, you need to setup IE6.0 before using the menu.

→ The menu is not available for Windows 2008 server core environment.

❑ Is **Shift** pressed?

→ Setting the DVD/CD with **Shift** pressed down cancels the Autorun feature.

❑ 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. In such a case, eject the disk from the disk drive once and insert it again.

Some menu items are grayed-out:

❑ Is your system 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.

Collecting Event Log

This section describes on how to collect the log of various events that occurred on the server.

> **IMPORTANT:** If STOP error, system error, or stall occurred, follow the procedure below after restarting the system.

1. Click [Management Tool] → [EventViewer] from the Control Panel.

2. Select the type of the log to collect.

    On [Application Log], the events related to the running application is archived. On [Security Log], the events related to the security is archived. On [System Log], the events occurred at the item which configures Windows system is archived.

3. Click [Save as...] in the [Run] menu.

4. Input the file name of archived log in the [File Name] box.

5. Select the type of the log file you want to save in the [File Type] list box and click [OK].

For more information, refer to Windows Online Help.

Collect Configuration Information

This section describes on how to collect the information on hardware configuration and inside specification.

In order to collect information, "Diagnostic Program" is used.

> **IMPORTANT:** If STOP error, system error, or stall occurred, follow the procedure below after restarting the system.

1. Point to [Settings] in Start menu, and click [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click [Management Tool], and double-click [Computer Management].

   The [Computer Management] dialog box appears.

3. Click [System Tool] → [System Information].

4. Click [Save as System Information File] in the [Operation] menu.

5. Input the file name to save in the [File Name] box.

6. Click [Save].

Collecting Dr. Watson Diagnostic Information

Dr. Watson collects diagnostic information related to application errors. The location to save the information can be specified as you like. For more information, refer to Chapter 5.

Memory Dump

If an error occurs, the dump file should be saved to acquire necessary information.

If you saved the dump to DAT, write down that it is saved as "NTBackup" or "ARCServe" on the label. You can specify the location to save the diagnostic information as you like. For more information, refer to "Specifying Memory Dump (Debug Information (refer to Chapter 5 for detail)".

> **IMPORTANT:**
>
> ■ Consult with your service representative before dumping the memory. Dumping the memory while the server is in the successful 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 may result in dumping improper data.

RECOVERY FOR Windows SYSTEM

If any file necessary for running the OS is damaged, use the following procedures to recover the system.

> **IMPORTANT:**
>
> - After recovering the system, see "Updating the System" in Chapter 5 and be sure to update the system.
>   Also, you need to update all the drivers after the system update. For more information, see "Installing and Setting Device Drivers" in Chapter 5.
>
> - If the hard disk drive can not be recognized, you can not recover the system.

For Windows Server 2008 R2

If the system fails to start for some reason, rebuild the system using the recovery console. Note that this method is recommended for only users and administrators who have a thorough knowledge of the recovery console.

For more information, refer to Online Help.

For Windows Server 2008

If the system fails to start for some reason, rebuild the system using the recovery console. Note that this method is recommended for only users and administrators who have a thorough knowledge of the recovery console.

For more information, refer to Online Help.

For Windows Server 2003 x64 Editions

If the system fails to start for some reason, rebuild the system using the recovery console. Note that this method is recommended for only users and administrators who have a thorough knowledge of the recovery console.

For more information, refer to Online Help.

For Windows Server 2003

If the system fails to start for some reason, rebuild the system using the recovery console. Note that this method is recommended for only users and administrators who have a thorough knowledge of the recovery console.

For more information, refer to Online Help.

MAINTENANCE TOOLS

The Maintenance Tools is a tool of this product prevention to maintain, and to analyze the trouble.

> **IMPORTANT:** This guide contains procedures to use a floppy disk, however, your server is not equipped with factory-installed floppy disk drive. Use the optional Flash FDD or USB FDD.

Starting Maintenance Tools

The Maintenance Tools is started according to the following procedure.

1. Turn on peripheral devices and the server in this order.

2. Insert the NEC EXPRESSBUILDER DVD-ROM supplied with your server into the optical disk drive of your server.

3. Press **Ctrl**, **Alt**, and **Delete** to reboot the server from the NEC EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)

System boots up displaying Boot selection menu.

> **IMPORTANT:** An initial selection of the menu is "Os installation". "Os installation" starts by the automatic after the Boot selection menu is displayed.

4. When a local console is used, "Tool menu (Normal mode)" is selected.

Moreover, "Tool menu (Redirection mode)" is selected when using it with remote console.

> **IMPORTANT:** An initial selection of the menu is "Japanese".
> "Japanese" starts by the automatic operation when the operation is not
> done for five seconds after the Language selection menu is displayed.

5. "English" is selected.

The tool menu is displayed.

When you use a local console

```
                              TOOL MENU
        ---- TOOL MENU ----
        Maintenance Utility
        BIOS/FW Updating
        ROM-DOS Startup FD
        Test and diagnostics
        System Management
        Return to previous menu


                        Automatic select at 10 seconds




System information is displayed, managed, and set.
```

When you use a remote console

6. Each tool is selected, and it starts.

Function of Maintenance Tools

The following functions can be executed 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-ROM you have created contain a file that describes operation of the utility, but do not attempt to use the utility by yourself. Contact your service representative and follow instructions.
>
> ■ See the on-line help for details of 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 filed 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 information on the processor and the BIOS and export it 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 personnel 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 restarting 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

Creates 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. See Chapter 7 for details.

■ 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".

Maintenance Tools with Remote Console

This subsection describes the procedures for using Maintenance Tools with remote console.

Maintenance Tools contains the remote console feature that allows the system administrator to set up the server from the management workstation (management PC) via the network or the server's COM B (serial) port.

> **IMPORTANT:**
> - Do not use this feature on any other computer than the server, or on any other server obtained without the NEC EXPRESSBUILDER. Doing so may cause a failure of the server.
> - Be sure to select [Tool menu (Redirection mode)] in [Boot selection] menu from the remote console.

Starting

The following two methods are available to start the server.

- Running Maintenance Tools from the management PC via LAN
- Running Maintenance Tools from the management PC via direct connection (COM B)

For the procedure for starting Maintenance Tools with Remote Console, refer to the online document of NEC ESMPRO Manager.

IMPORTANT:

- Do not change the boot device order in BOOT menu in BIOS SETUP. NEC EXPRESSBUILDER cannot be used if the DVD-ROM drive is not the first device to launch the system.

- Connect the LAN cable to the connector on management LAN port. Or, connect the LAN cable to LAN connector 1 if Shared BMC LAN feature is used.

- Use the serial port B for direct connection.

- To use this feature, you need to create a configuration file (3.5-inch floppy disk) that includes communication method between the server and the management PC, and various setup parameters. Use NEC ESMPRO BMC Configuration or NEC ESMPRO Agent Extension or run "System Management" menu from NEC EXPRESSBUILDER to create a configuration file. Save the configuration file into the root directory of the floppy disk as the following file name.
  – File name: CSL_LESS.cfg

- If you exit the BIOS SETUP by unusual way (e.g., forced power-off or reset), the redirection process may fail. In such a case, setup again by using the configuration file.

- On Windows Server 2008, you need to open Device Manager, disable the COM port, and restart the system to use the direct connection through COM port.

NOTE: The following items of BIOS setup information will be set as shown below.

- LAN Controller: [Enabled]
- Serial Port A: [Enabled]
  Base I/O Address: [3F8]
  Interrupt: [IRQ 4]
- Serial Port B: [Enabled]
  Base I/O Address: [2F8]
  Interrupt: [IRQ 3]
- BIOS Redirection Port: [Serial Port B]
- Baud Rate: [19.2K]
- Flow Control: [CTS/RTS]
- Console Type: [PC ANSI]

RESETTING THE SERVER

If the server halts before starting the OS, press and hold **Ctrl** and **Alt** and press **Delete**. This restarts the server.

> **IMPORTANT:** Resetting the server clears the DIMM memory and the data in process. To reset the server when it is not frozen, make sure that no processing is in progress.

FORCED SHUTDOWN

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

Press and hold the POWER/SLEEP switch on the server for at least four seconds. The power is forcibly turned off. To turn on the power back again, wait approximately 10 seconds after turning off the power (forced shutdown).

> **IMPORTANT:**
>
> - If the remote power-on function is used, cycle the power once to load the OS, and turn off the power again in the normal way.
>
> - If the processor is heated excessively, the circuit for protecting expensive components is started. If so, the POWER/SLEEP switch cannot be used to control the power because the system is entered into the reset status. Pull out the power cord and turn off the power. After a while, check the operation environment (including the ambient temperature). Then connect the power cord and turn on the power. It may be necessary to leave the power-off status in the period until the processor is cooled sufficiently (about five minutes in normal).

Chapter 9

Upgrading Your Server

This chapter describes internal optional devices available for the server, procedures for installing or removing such optional devices, and notes on using them.

IMPORTANT:

- Optional devices described in this chapter may be installed or removed by any user. However, 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. NEC recommends you ask your service representative for installing or removing any optional devices.

- Make sure to use only optional devices and cables authorized by NEC. Repair of the server due to malfunctions, failures, or damage resulted from installing such devices or cables will be charged.

- For the Windows Server operating system user:
  When you made any change to the hardware configuration, make sure to update the system (see Chapter 5 for details.).

Safety Notes

Observe the following notes to install or remove optional devices safely and properly.

⚠ WARNING
Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-4 to 1-12 for details. ■ Do not disassemble, repair, or alter the server. ■ 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. Failure to follow these instructions might cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details. ■ Do not lift the server only by a single person. ■ Make sure to complete card installation. ■ Do not install the server on the rack leaving the cover removed. ■ Do not install the server on the rack halfway. ■ Do not pinch your fingers with mechanical component. ■ Avoid installation in extreme temperature conditions. ■ Failure to follow these warnings may cause an electric shock.

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 a wrist strap (an arm belt or anti-static glove).
Wear a wrist strap on your wrist. 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 a metal part regularly when working with components to discharge static electricity.

■ Select a suitable work space.
  − 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 work table.
Place the server on an anti-static mat to work with it.

■ Cloth
  − 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 jewels (a ring, bracelet, or wrist watch) 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 any component by its edge to avoid touching any terminals or parts.
  − o store or carry any component, place it in an anti-static bag.
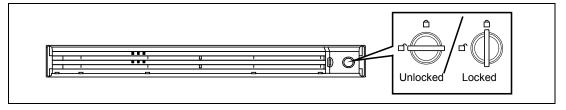
Preparing for Installation and Removal

Follow the procedure below to prepare for installing or removing components.
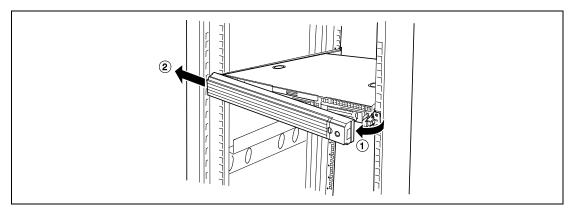
1.   Shutdown the OS.

Shutdown process is not required if the hard disk drives and the additional power supply units are hot-swappable.

2.   Unlock the front bezel with the security key.

3.   Remove the front bezel from the chassis.

4.   Press the POWER switch to power off the server (the POWER LED goes off).

5.   Remove all cables and power cords from the server.

Prepare a Phillips screwdriver to install or remove the component.
The server needs to be pulled out from the rack for installing/removing any internal components other than the hard disk drives and power supply units.

⚠ CAUTION

Observe the following instructions to use the server safely.   Failure to follow these instructions might cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details.
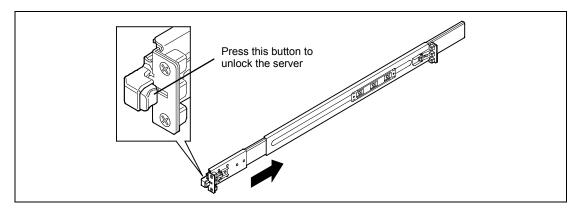
- Do not install the server on a rack with leaving covers removed.
- Do not pinch your finger with mechanical components.
- Note high temperature.
- Do not pull out a device from the rack if the rack is unstable.
- Do not leave more than one device being pulled out from the rack.

6. See page 9-4 to prepare.
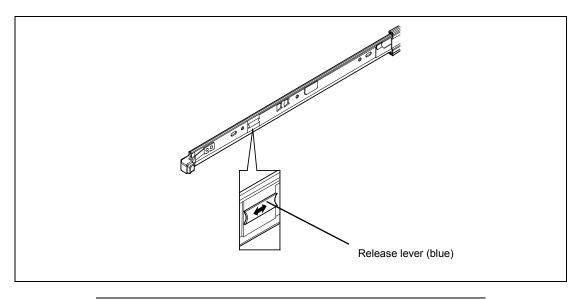
> **NOTE:** To confirm the device you are going to maintain, use the UID switch and the UID LED that goes on when the switch is pressed.

7. Press the unlock buttons at the right and left sides of the front panel, and slowly pull out the server from the rack.

The server is locked while you are pulling it. Stop pulling when it is locked.

Press this button to
unlock the server

To place the server in the rack, push it back into the rack while pushing the right and left release levers (blue) forward or rearward.

Release lever (blue)

> **IMPORTANT:** Be very careful not to get your finger caught in the levers or rails.

Attachment and post-attachment checks

After adding an option or attaching a component, check the following points.

■ **Attach removed components in the same way as before.**
When adding or removing components, attach removed components and cables in the same way as before. Forgetting to attach components or leaving cables unplugged during assembly can cause operational problems. In addition, be sure to attach components and cables securely, not loosely.

■ **Make sure that attaching components and screws in the server has not been forgotten.**
In particular, make sure that attaching screws and other conductive components has not been forgotten. Leaving a conductive component on the motherboard or the end of a cable can cause operational problems when the power is turned on.

■ **Check the effectiveness of server-internal cooling.**
Make sure that the vents used to cool the wires running through the inside of the server are not blocked. If the cooling effectiveness is lost, the server-internal temperature can increase, causing operational problems.

■ **Use tools to check the operation.**
After adding certain devices, it is necessary to make sure they are correctly attached by using tools such as diagnostic utilities or BIOS setup utilities. These requirements are described in detail in the procedures for adding each device. See these procedures as necessary.

Hard Disk Drive

The hard disk drive bay at the front of the server chassis may contain hard disk drives of approximately 25.4 mm (1 inch) high.
The disk interface, number and size of hard disk drives depend on server model, as described below.
The IDs of hard disk drive (channel numbers or port numbers) are also predefined.
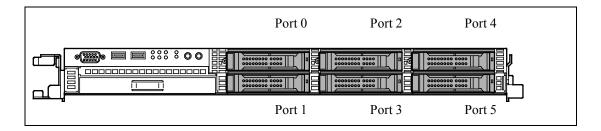
■ 2.5-inch Disk Model

– SAS hard disk drive
The optional RAID Controller (equivalent to N8103-129/130) supports SAS hard disk drives. Up to six hard disk drives (mounted on the dedicated 2.5-inch width tray) can be installed.

> **IMPORTANT:** Use a hard disk drive authorized by NEC. Installing a third-party hard disk drive might cause a failure of the server as well as the hard disk drive. Purchase hard disk drives of the following models (current as of Oct. 2011):
> – N8150-300 (146.5GB, 10000rpm, SAS)
> – N8150-301 (300GB, 10000rpm, SAS)
> – N8150-322 (450GB, 10000rpm, SAS)
> – N8150-304 (600GB, 10000rpm, SAS)
> – N8150-332 (900GB, 10000rpm, SAS)
> – N8150-302 (73.2GB, 15000rpm, SAS)
> – N8150-331 (300GB, 15000rpm, SAS)
> – N8150-303 (146.5GB, 15000rpm, SAS)

A dummy tray is installed in the hard disk drive bays except for Port 0. The purpose of a dummy tray is to increase the cooling effect in the server. Install a dummy tray in slots not containing a hard disk drive.

– SATA hard disk drive
The Onboard RAID Controller (LSI Embedded MegaRAID^{TM}) and the optional RAID Controller (N8103-129/130) support the Serial ATA (SATA) interface. Up to six hard disk drives (mounted on the dedicated 2.5-inch width tray) can be installed.
*: Up to four hard disk drives can be installed when connected onboard.

IMPORTANT: Use a hard disk drive authorized by NEC. Installing a third-party hard disk drive might cause a failure of the server as well as the hard disk drive. Purchase hard disk drives of the following models (current as of Oct. 2011):
– N8150-276 (160GB, 7200rpm, SATA2/300)
– N8150-277 (500GB, 7200rpm, SATA2/300)
– N8150-334 (1TB, 7200rpm, SATA2/300)

– SSD (solid state drive)
The Onboard RAID Controller (LSI Embedded MegaRAID^{TM}) and the optional RAID Controller N8103-129/130) support the Serial ATA (SATA) interface. Up to six solid state drives (mounted on the dedicated 2.5-inch width tray) can be installed.
*: Up to four solid state drives can be installed when connected onboard.

IMPORTANT: Use a solid state drive authorized by NEC. Installing a third-party hard disk drive might cause a failure of the server as well as the solid state drive. Purchase solid state drives of the following model (current as of Oct. 2011):
– N8150-707 (100GB, SSD)
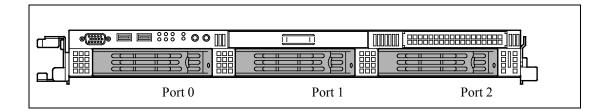
■ 3.5-inch Disk Model

- SATA hard disk drive
  The Onboard RAID Controller (LSI Embedded MegaRAID™) or optional RAID
  Controller (N8103-129/130) supports a serial ATA (SATA) interface. Up to three hard
  disk drives (mounted on the dedicated 3.5-inch width tray) can be installed.

  > **IMPORTANT:** Use a hard disk drive authorized by NEC. Installing a
  > third-party hard disk drive might cause a failure of the server as well as
  > the hard disk drive. Purchase hard disk drives of the following models
  > (current as of Oct. 2011):
  > – N8150-209A (250GB, 7200rpm, SATA2/300)
  > – N8150-274 (500GB, 7200rpm, SATA2/300)
  > – N8150-263 (1TB, 7200rpm, SATA2/300)
  > – N8150-278 (2TB, 7200rpm, SATA2/300)

Port 0   Port 1   Port 2

The hard disk drive bays are connected to the Mini SAS connector on the motherboard.
To use the hard disk drives in a RAID System, refer to:

- When using the Onboard RAID Controller (LSI Embedded MegaRAID™):
  Use LSI Software RAID Configuration Utility or Universal RAID Utility to build,
  configure, and manage the RAID System.
  For details, see "RAID System Configuration" (on page 4-38) and "Universal RAID
  Utility" (on page 6-24).
- When using an optional RAID Controller (N8103-129/130):
  Use WebBIOS or Universal RAID Utility to build, configure, and manage the RAID
  System.
  For details, refer to the manual that comes with the optional RAID controller, or see
  "Universal RAID Utility" (on page 6-24).

Installation

Take the following steps to install a hard disk drive. This procedure applies to all the hard disk drive bays. See the next section for the procedure installing a hard disk drive in the flex bay.

> **NOTE:** Any hard disk drive can be installed or removed in or from the server only by removing the front bezel.

> **IMPORTANT:**
>
> - In the RAID System, use the hard disk drives having the same specification including the capacity.
> - Do not press the POWER switch during the installation or removal of the hard disk drive if your server is running.
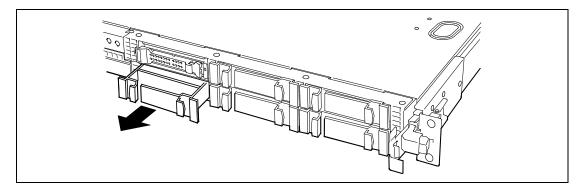
2.5-inch hard disk drive

1. See page 9-4 to prepare.

2. Locate the slot in which you are going to install a hard disk drive.

   The server has six slots. Fill the vacant slots with hard disk drives from the lower port number (as described in "2.5 inch hard disk drive" on page 9-7).
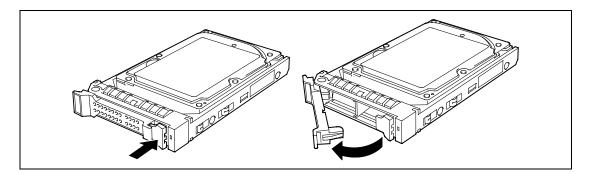
3. Remove the dummy tray.
   There are dummy trays in all hard disk drive bays.
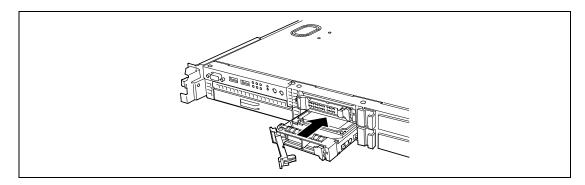
> **IMPORTANT:**
>
> - Keep the dummy tray for future use.
> - The purpose of a dummy tray is to increase the cooling effect in the server. Install a dummy tray in slots not containing a hard disk drive.

4. Unlock the hard disk drive handle.
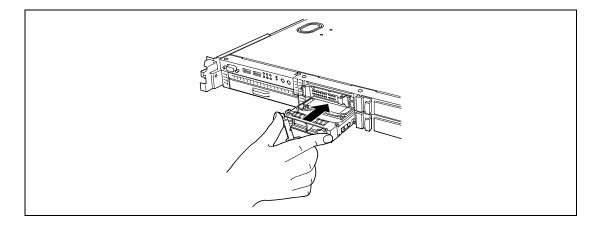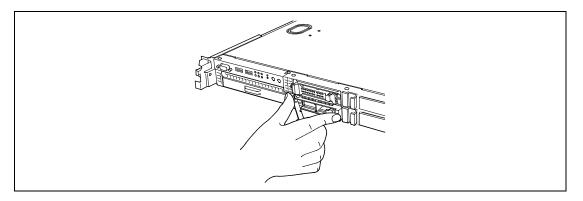
5. Firmly hold the drive carrier, and insert it into the slot.

6. Put your fingers on the front of the drive carrier.

7. Push the drive carrier into the slot until it stops.
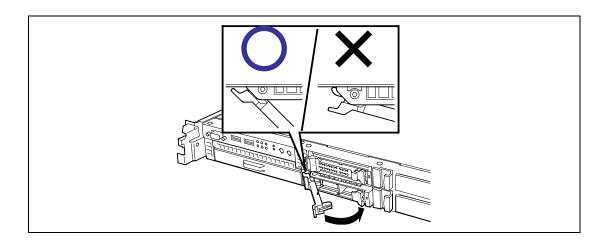
IMPORTANT:

- Confirm that the handle is hooked to the frame when having inserted the hard disk drive.

- Be careful not to get your finger caught between the handle and tray.

NOTE: The hard disk drive bay is located close to the POWER switch. Pay attention not to press the POWER switch when installing/removing the hard disk drive. If the POWER switch is pressed by mistake, the system starts shutdown process.

8. Slowly close the handle.

The drive carrier is locked when a "click" is heard.

IMPORTANT:

- Be careful not to get your finger caught between the handle and tray.

- Push the drive further to check if it is firmly secured.

NOTE: Confirm that the handle is hooked to the frame when having inserted the hard disk drive.

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9. Power on the server, and run the SETUP utility.
   Select the [Boot] menu (described on page 4-34) to set the boot priority. When you install an additional hard disk drive, the boot priority stored in BIOS is cleared.

10. Install the front bezel you removed in step 2.

    There are tabs on the left side of the front bezel. Engage the tabs with the server frame, install the front bezel, and lock it with the security key.

3.5-inch hard disk drive

1. See page 9-4 to prepare.

2. Unlock the front bezel with the security key and remove the front bezel.

3. Locate the slot in which you are going to install a hard disk drive.
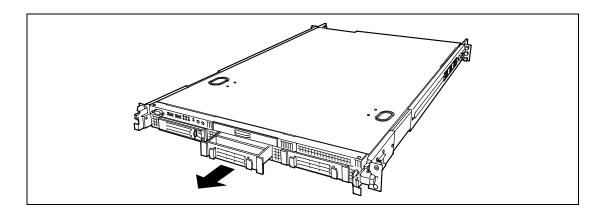
   The server has three slots. Install the hard disk drives from the left vacant slot.

4. Remove the dummy tray.
   There are dummy trays in all hard disk drive bays.
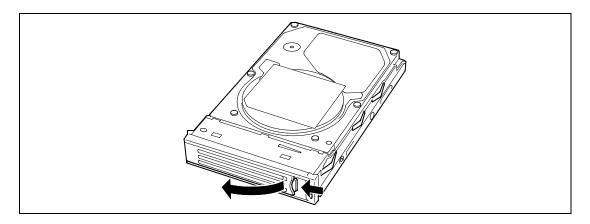
IMPORTANT:

- Keep the dummy tray for future use.

- The purpose of a dummy tray is to increase the cooling effect in the server. Install a dummy tray in slots not containing a hard disk drive.

---

5.   Unlock the hard disk drive handle.
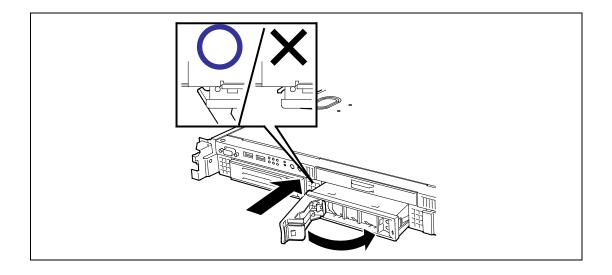
6.   With the handle in the fully open position, firmly hold the drive carrier and handle, and insert it into the chassis.

> **IMPORTANT:**
>
> - Push the drive to check if it is firmly secured.
> - Carefully hold the hard disk drive with both hands.

> **NOTE:** Do not press the POWER switch during the installation or removal of the hard disk drive if your server is running.

7. When the handle begins to close by itself, slowly close the handle.

The drive carrier is locked when a "click" is heard.

> ### IMPORTANT:
>
> - Be careful not to get your finger caught between the handle and tray.
>
> - Push the drive further to check if it is firmly secured.

> **NOTE:** Confirm that the handle is hooked to the frame when having inserted the hard disk drive.

8. Power on the server, and run the SETUP utility.

Select the [Boot] menu (described on page 4-34) to set the boot priority. When you install an additional hard disk drive, the boot priority stored in BIOS is cleared.

9. Install the front bezel you removed in step 2.
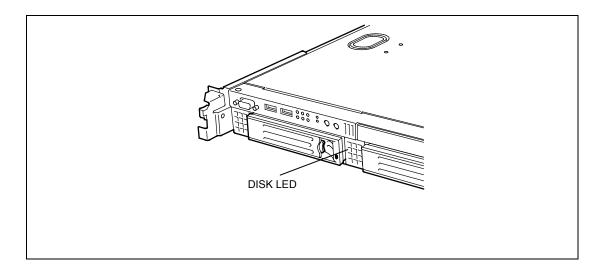
There are tabs on the left side of the front bezel. Engage the tabs with the server frame, install the front bezel, and lock it with the security key.

Removal

Take the following steps to remove a hard disk drive:
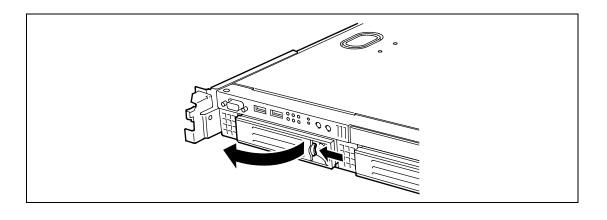
3.5-inch hard disk drive

> **NOTE:** If removing a failed hard disk drive, confirm the slot in which the DISK LED of the hard disk drive is amber before starting the removal.
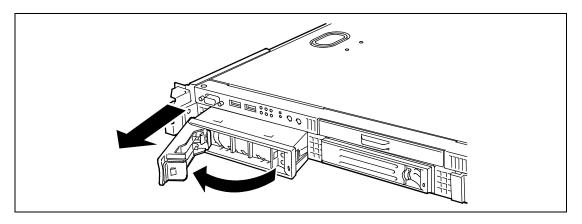
DISK LED

1. See page 9-4 to prepare.
2. Unlock the front bezel with the security key, and remove the front bezel.
3. Push the lever to unlock, and open the handle.

> **IMPORTANT:** Do not press the POWER switch during the installation or removal of the hard disk drive if your server is running.

4. Firmly hold the handle and hard disk drive, and pull out the hard disk drive.

5. If using the server with the hard disk drive removed, install the dummy tray in the vacant slot to ensure the cooling efficiency.

6. Power on the server, and run the SETUP utility.
Select the [Boot] menu (described on page 4-34) to set the boot priority. When you install an additional hard disk drive, the boot priority stored in BIOS is cleared.
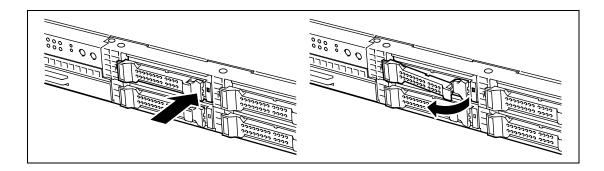
7. Install the front bezel you removed in step 2.

2.5-inch hard disk drive

1. See page 9-4 to prepare.

2. Unlock the front bezel with the security key, and remove the front bezel.

3. Push the lever to unlock, and open the handle.
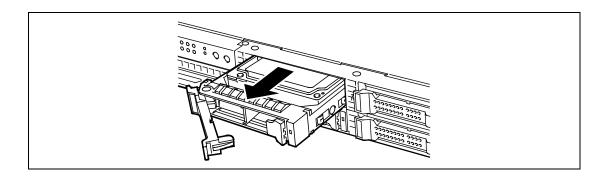
> **IMPORTANT:** Do not press the POWER switch during the
> installation or removal of the hard disk drive if your server is running.

4. Firmly hold the drive carrier, and pull out the hard disk drive. Do not hold the handle.

5. If using the server with the hard disk drive removed, install the dummy tray in the vacant slot to ensure the cooling efficiency.

6. Power on the server, and run the SETUP utility.
Select the [Boot] menu (described on page 4-34) to set the boot priority. When you install an additional hard disk drive, the boot priority stored in BIOS is cleared.

7. Install the front bezel you removed in step 2.

Notes on Replacing Hard Disk Drives in the RAID System

When the hard disk drives are in the RAID System, you can restore the state before an error using the auto-rebuild feature that stores the data in the old hard disk drive into a new one.
The auto-rebuild feature is available for the RAID1, RAID5, RAID6, RAID10, or RAID50.
Auto-rebuild is carried out when you hot-swap a failed hard disk drive with a new one (replace the disk while the server is powered). While auto-rebuild is in progress, the DISK LED flashes green and amber alternatively to indicate it.
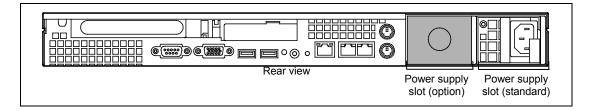
Observe the following notes for auto-rebuild.

- Do not power off the server in the period between a hard disk drive error and completion of auto-rebuild.

- When you removed a hard disk drive, wait at least 90 seconds before installing the hard disk drive back again.

- Do not replace another hard disk drive while rebuilding is in progress. (The DISK LED flashes in green and amber alternatively while rebuilding the hard disk drive.)

Power Supply Unit

Your server contains one or two power supplies.
The second power supply is optional and provides a redundant configuration that ensures continued operation of the system in the unlikely event one of the power supplies fails.

Rear view

Power supply
slot (option)

Power supply
slot (standard)

Installation
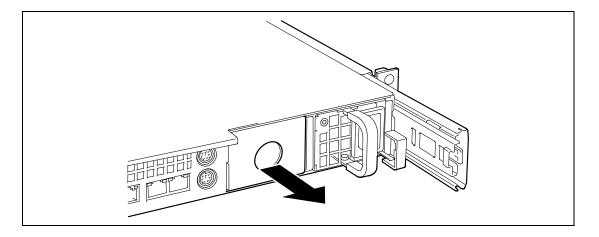
Take the following steps to install a power supply unit:

1. See page 9-4 to prepare.
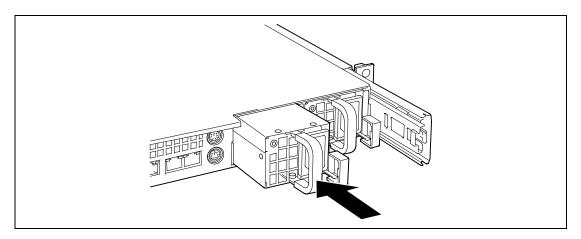
> **IMPORTANT:** Be sure to turn off the power. Failure to do so causes the server to malfunction or fail.

2. Remove the blank cover.
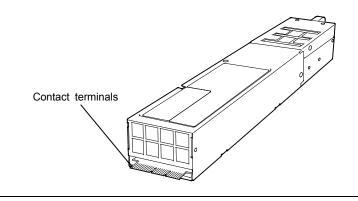
> **IMPORTANT:** Keep the removed blank cover for future use.
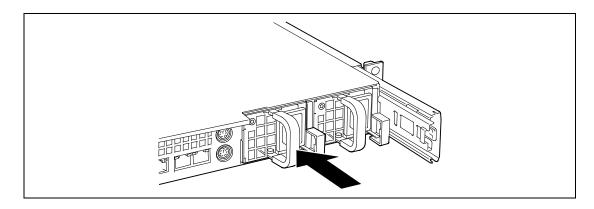
3. Insert the power supply unit.

IMPORTANT: Do not touch the terminals of the power supply unit.

Contact terminals
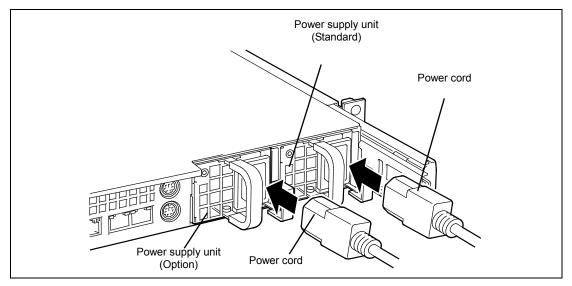
4. Grasp the handle and firmly push the power supply.

The power supply unit is locked when a distinct "click" is heard.
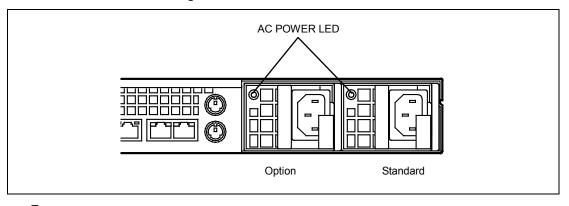
5. Connect two power cords.

Use the power cord provided with the standard power supply unit and the one provided with the system. The AC POWER LEDs flash green when the power cords are connected.
If the power unit is not connected with the power cord, its AC POWER LED goes on amber.
When the power cord is connected, AC POWER LEDs on both power supply units go on green.

6. Power on the server.

The AC POWER LEDs go on.

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

See page 8-10 for details on the error messages.
If the AC POWER LEDs are off, reinstall the power supply units. If the same error message still appears, contact your sales representative.

Replacing a Failed Power Supply Unit

Replace only a failed power supply unit.

⚠ CAUTION
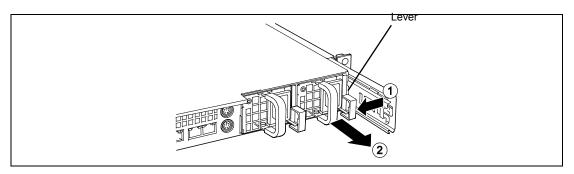
Observe the following instructions to use the server safely.   Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details.

■ Failure to follow this warnings may cause an electric shock.

IMPORTANT: Do not remove a power supply unit operating normally.

NOTE: If one power supply unit fails while the server contains two power supply units in a redundant configuration, the failed power supply unit can be replaced with the system operating (power-on state). (Skip step 1.)

1. Locate the failed power supply unit by the AC POWER LED on the rear of each power supply unit. (The LED of the failed power supply unit is lit amber or flashing amber.)

2. Shutdown the system, and press the POWER switch to turn off the power.

3. Disconnect the power cord from the failed power supply.

4. Hold the handle of the failed power supply.

5. While pressing the lever, pull the power supply to remove it from the chassis.

6. If operating the server with a single power supply unit without installing a new one, install the cover you removed in step 2 of installation procedure.

IMPORTANT: To maintain the cooling effect in the server, install the blank cover in the vacant slot.

7. Install the new power supply unit taking steps 3 to 7 of "Installation", and confirm that the power supply unit is installed normally.
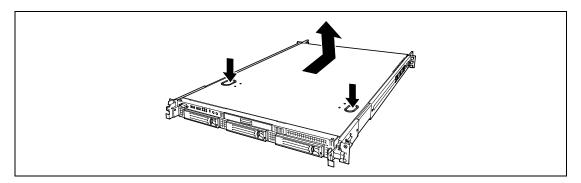
> **NOTE:** If one of the two power supply units of the server is replaced, the AC POWER LED of the new power supply unit goes on amber until the AC power cord is connected. It turns on green when the AC power cord is connected. (If it is replaced while the power is off, the LED flashes green. The LED goes on green when the power is turned on.)

Top Cover

Open the top cover when installing/removing a processor, or reconnecting an internal cable.

Removal

1. See page 9-4 to prepare.
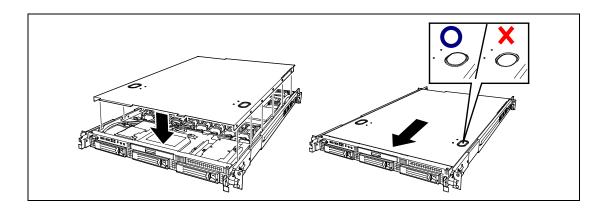
2. Pull out the server from the rack (as described on page 9-4).

3. Slide the top cover toward the rear of the server while pressing the lock buttons on the cover.

4. Lift off the top cover from the server.

Installation

When installing the top cover, confirm that the tab of the cover is securely inserted into the slots in the server frame. Slide the top cover toward the rear of the server. The top cover is locked when a distinct "click" is heard. At this time, check the lock buttons for normal state.

> **NOTE:** The system must be operated with the top cover installed to ensure proper cooling.

DIMM

Install an additional DIMM (Dual Inline Memory Module) to a DIMM socket on the motherboard in the server. The motherboard is provided with 12 DIMM card slots.

> **NOTE:** Up to 192GB of memory (16GB DIMM × 12) can be installed. Upon factory shipment, no memory is installed.

> **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 on-board parts by a bare hand or place the DIMM directly on the desk. For static notes, see page 9-3.
>
> ■ Make sure to use a DIMM authorized by NEC. Installing a third-party DIMM might 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.
>
> Purchase DIMMs of the following models (current as of Oct. 2011):
> – N8102-371(F) Additional 1GB memory module
> – N8102-372(F) Additional 2GB memory module
> – N8102-428(F) Additional 2GB memory module
> – N8102-373(F) Additional 4GB memory module
> – N8102-429(F) Additional 4GB memory module
> – N8102-374(F) Additional 8GB memory module
> – N8102-375(F) Additional 16GB memory module
> – N8102-387 Additional 2GB memory module *
> – N8102-388 Additional 4GB memory module *
> – N8102-389 Additional 8GB memory module *
> – N8102-390 Additional 16GB memory module *
> – N8102-391 Additional 32GB memory module *
>
> * For Memory Mirroring or Memory LockStep (x8 SDDC)
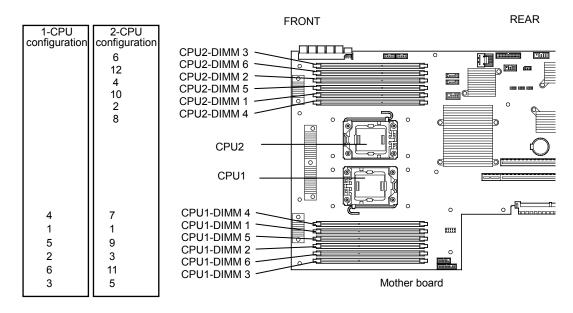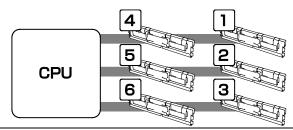
Installation Order

Installation order depends on the number of CPUs installed.

- 1-CPU configuration:
  Install DIMMs starting from the smallest slot number.

- 2-CPU configuration:
  Alternately install DIMMs starting from the smallest slot number of each CPU.

- Install DIMMs starting from the smallest slot number as follows:
  (N8102-375(F) → N8102-374(F) → N8102-373(F) → N8102-429(F) → N8102-372(F)
  → N8102-428(F) → N8102-371(F) or N8102-391 → N8102-390 → N8102-389 →
  N8102-388 → N8102-387)

1-CPU configuration	2-CPU configuration
	6
	12
	4
	10
	2
	8
4	7
1	1
5	9
2	3
6	11
3	5

FRONT   REAR

CPU2-DIMM 3
CPU2-DIMM 6
CPU2-DIMM 2
CPU2-DIMM 5
CPU2-DIMM 1
CPU2-DIMM 4

CPU2

CPU1

CPU1-DIMM 4
CPU1-DIMM 1
CPU1-DIMM 5
CPU1-DIMM 2
CPU1-DIMM 6
CPU1-DIMM 3

Mother board

IMPORTANT: If CPU2 is not installed, CPU2_DIMM1 through CPU2_DIMM6 are not available.

NOTES:
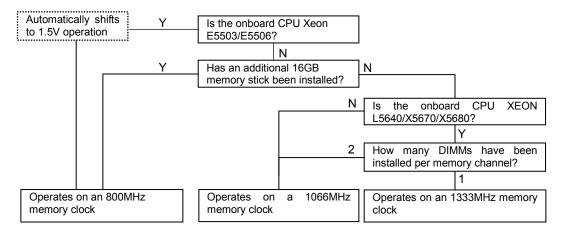
- If an N8102-371(F)/372(F)/373(F /374(F)/375(F)/428(F)/429(F) memory stick is installed or the standard memory configuration is used, memory mirroring and Memory LockStep (x8 SDDC) features are not supported.

- N8102-371(F)/428(F) memory stick is unavailable for x4 SDDC feature. To use x4 SDDC feature, N8102-372(F)/373(F)/374(F)/375(F)/429(F) memory stick is required.

Memory Clock
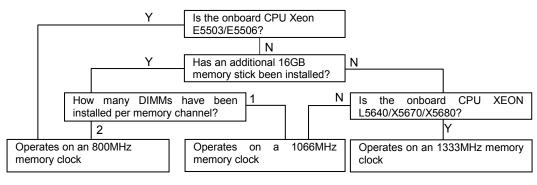
The DR3-800/1066/1333MHz memory clock frequencies are supported, but this depends on the CPU and memory configurations.
Note that all bus memory clocks operate at the same clock frequency.
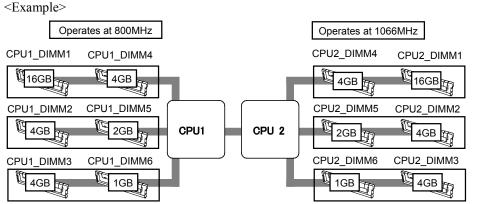
Memory drive voltage: Low (1.35V/power-saving mode)

```
┌ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐           ┌───────────────────────────┐
  Automatically  shifts    Y     │ Is the onboard CPU Xeon   │
  to 1.5V operation  ──────────  │ E5503/E5506?              │
└ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘           └───────────────────────────┘
                                         │ N
                      Y          ┌───────────────────────────┐  N
                   ───────────── │ Has an additional 16GB    │──────┐
                                 │ memory stick been installed?│     │
                                 └───────────────────────────┘      │
                                              N   ┌──────────────────────────────┐
                                          ──────  │ Is  the  onboard  CPU  XEON  │
                                                  │ L5640/X5670/X5680?           │
                                                  └──────────────────────────────┘
                                                              │ Y
                                              2   ┌──────────────────────────────┐
                                          ──────  │ How  many  DIMMs  have  been │
                                                  │ installed per memory channel?│
                                                  └──────────────────────────────┘
                                                              │ 1
┌──────────────────────┐  ┌──────────────────────┐  ┌──────────────────────────────┐
│ Operates on an 800MHz│  │ Operates  on  a  1066MHz│ Operates on an 1333MHz memory│
│ memory clock         │  │ memory clock         │  │ clock                        │
└──────────────────────┘  └──────────────────────┘  └──────────────────────────────┘
```

Memory drive voltage: Normal (1.5V)

```
                      Y          ┌───────────────────────────┐
                   ───────────── │ Is the onboard CPU Xeon   │
                                 │ E5503/E5506?              │
                                 └───────────────────────────┘
                                         │ N
                      Y          ┌───────────────────────────┐  N
                   ───────────── │ Has an additional 16GB    │──────┐
                                 │ memory stick been installed?│     │
                                 └───────────────────────────┘      │
      ┌──────────────────────────────┐  1      N  ┌──────────────────────────────┐
      │ How  many  DIMMs  have  been │─────   ──── │ Is  the  onboard  CPU  XEON  │
      │ installed per memory channel?│            │ L5640/X5670/X5680?           │
      └──────────────────────────────┘            └──────────────────────────────┘
                  │ 2                                          │ Y
┌──────────────────────┐  ┌──────────────────────┐  ┌──────────────────────────────┐
│ Operates on an 800MHz│  │ Operates  on  a  1066MHz│ Operates on an 1333MHz memory│
│ memory clock         │  │ memory clock         │  │ clock                        │
└──────────────────────┘  └──────────────────────┘  └──────────────────────────────┘
```

<Example>

If the onboard CPU is Xeon E5620

Memory RAS Feature
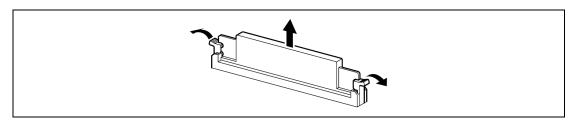
The server has RAS features including "Standard memory configuration (x4 SDDC)", a "Memory Mirroring feature", a "Memory LockStep (x8 SDDC) feature", and a "Memory Sparing feature". To use the Memory Mirroring or Memory LockStep (x8 SDDC) feature, see "Using the Memory RAS Features" (on page 9-34).

Installation

Install a DIMM in the following procedure.

> **IMPORTANT:** The server supports DIMMs of only the low-profile type (30 mm (1.2 inches) in height). It does not support DIMMs exceeding the specified height.
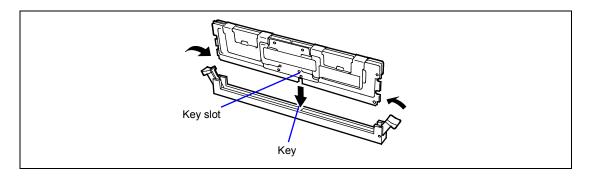
1. See page 9-4 to prepare.

2. Pull out the server from the rack (as described on page 9-4).

3. Remove the top cover (as described on page 9-25).

4. Locate the DIMM socket which you are going to install DIMM.

5. Make sure the clips at either end of the DIMM socket(s) are pushed outward to the open position.

6. Open levers at left and right side of the DIMM socket, and remove the dummy memory.

> **IMPORTANT:** Keep the removed dummy memory for future use.

7. Holding the DIMM by the edges, remove it from its anti-static package.

8. Position the DIMM above the socket. Align the small notch at the bottom edge of the DIMM with the key in the socket.

> **NOTE:** Make sure of the orientation of the DIMM.
> Position the DIMM so that a notch in the bottom edge of the DIMM aligns with the keyed socket. Applying too much pressure can damage the socket. Keyed DIMMs insert only one way.

Key slot

Key

9. Insert the bottom edge of the DIMM into the socket.

10. When the DIMM is inserted, push down on the top edge of the DIMM until the retaining clips snap into place.

IMPORTANT:
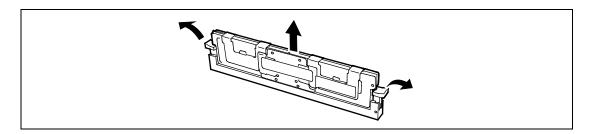
■ To avoid damage to the socket, do not apply excessive force while pressing the DIMM.

■ Make sure the clips are firmly in place.

---

11. Install the components you removed in steps 1 to 3.

12. Power on the server and verify that POST displays no error messages.

If POST displays an error message, take a note on the message and see the POST error messages listed on page 8-10.

13. Run the BIOS SETUP utility and select [Advanced] → [Memory Configuration] → [Memory Information] to verify that the installed DIMM shows a number. (See page 4-13 for details.)

14. Select [Memory Configuration] → [Memory Retest] on the [Advanced] menu and specify "Yes".

This setting is required to update the hardware configuration information. See page 4-12 for details.

15. If the Windows operating system is in use, set the paging file size to the recommended value (total memory size × 1.5) or a greater value. See Chapter 5 for details.

Removal

Remove the DIMM using the following procedure.

> **NOTE:** To remove the failed DIMM, check the error message appearing in POST or NEC ESMPRO to identify the DIMM socket (group) in which the failed DIMM is installed.

1. See page 9-4 to prepare.

2. Pull out the server from the rack (as described on page 9-4).

3. Remove the top cover (as described on page 9-25).

4. Open the clips at each end of the socket from which you remove the DIMM.

The DIMM pops out of the socket.

5. Hold the DIMM by the edges, lift it away from the socket, and store it in an anti-static package.

6. Reinstall all parts removed in Steps 3 to 7.

See installation procedures for detail explanations.

7. Power on the server and verify that POST displays no error messages.

If POST displays an error message, take a note on the message and see the POST error messages listed on page 8-10.

8. Run the BIOS SETUP utility and select [Advanced] → [Memory Configuration] → [Memory Retest] → [Enabled] to clear the error information of the removed DIMM. (See page 4-12 for details.)

This setting is required to update the hardware configuration information.
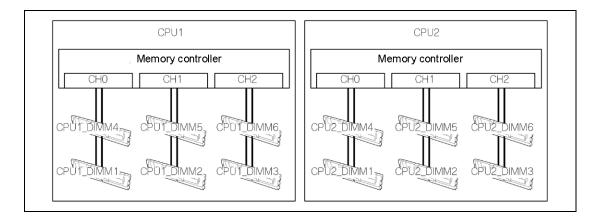
Using the Memory RAS Features

The server has RAS feature including "Standard memory configuration (x4 SDDC)", a "Memory Mirroring feature", a "Memory Sparing feature", and a "Memory LockStep (x8 SDDC) feature". SDDC (Single Device Data Correction) allows automatic correction of memory error (multi-bit error).

> **IMPORTANT:**
>
> - To use the Memory Mirroring feature or Memory LockStep (x8 SDDC) feature, an additional memory stick (N8102-387/388/389/390/391) is required.
>
> - To use x4 SDDC feature, an additional memory stick (N8102-372(F)/373(F)/374(F)/375(F)/429(F)) is required.

The memory area on the motherboard of the server is divided into two memory channels as shown in the figure below.
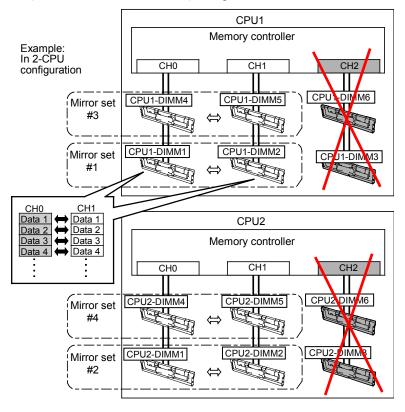
The memory mirroring and LockStep features keep memory redundancy between memory channels by monitoring or altering memory active/inactive status, respectively.

Memory mirroring

The memory mirroring feature writes the same data into two groups of DIMMs corresponding with each other between memory channels (channels 0 and 1) to provide data redundancy.

> **IMPORTANT:**
>
> - The memory mirroring feature uses channels 0 and 1. In memory mirroring configuration, the memory channel 2 of each CPU (CPU1-DIMM3/6, CPU2-DIMM3/6) is disabled.
>
> - To use the Memory Mirroring feature, an additional memory stick (N8102-387/388/389/390/391) is required.
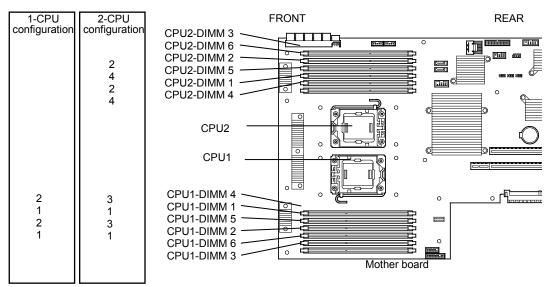
> **NOTE:** The operating system only recognizes a half of the total physical capacity.

The memory mirroring feature can be used under the following conditions:

- Install memory devices on two memory sockets configuring a mirror set.
- DIMMs to be used for mirror set should have the same capacity.
- Run SETUP (described on page 4-2), change parameters appropriately in the [Mirror] menu selected as shown below, save the settings and exit from SETUP.

  [Advanced] → [Memory Configuration] → [Memory RAS Mode] → [Mirror]

- After SETUP finishes, rerun SETUP and make sure that the installed DIMM status is [Mirror].
- Install memory devices in the following order.

1-CPU configuration	2-CPU configuration	
	2 4 2 4	
2 1 2 1	3 1 3 1	

FRONT   REAR

CPU2-DIMM 3
CPU2-DIMM 6
CPU2-DIMM 2
CPU2-DIMM 5
CPU2-DIMM 1
CPU2-DIMM 4

CPU2

CPU1

CPU1-DIMM 4
CPU1-DIMM 1
CPU1-DIMM 5
CPU1-DIMM 2
CPU1-DIMM 6
CPU1-DIMM 3

Mother board

The following mirroring cannot be configured:

- Memory mirroring within a specific memory channel

Notes on configuring memory mirroring

In memory mirroring configuration, [Memory RAS Mode] menu is changed from "Mirror" to "Independent" in the following cases:
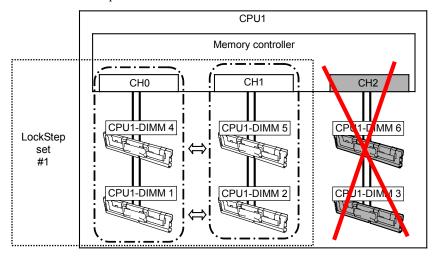
- When you additionally install DIMMs that unable to configure memory mirroring
- When you remove DIMMs that takes down the memory mirroring
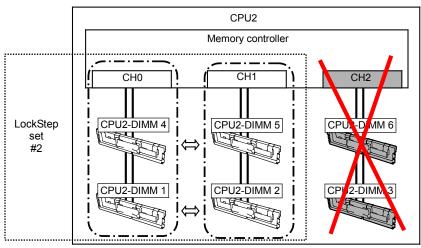
Memory LockStep feature (x8 SDDC)

In Memory LockStep (x8 SDDC) feature, the DIMMs in two groups corresponding to two memory channels (channels 0 and 1) is multiplexed and operated in parallel to enable x8 SDDC (x8 Single Device Data Correction). With this feature, a single device can detect and correct one to eight-bit error.

IMPORTANT:

- The Memory LockStep (x8 SDDC) feature uses channels 0 and 1. In LockStep configuration, the memory channel 2 of each CPU (CPU1-DIMM3/6, CPU2-DIMM3/6) is disabled.

- To use the Memory LockStep (x8 SDDC) feature, two sets of additional memory stick (N8102-387/388/389/390/391) are required.
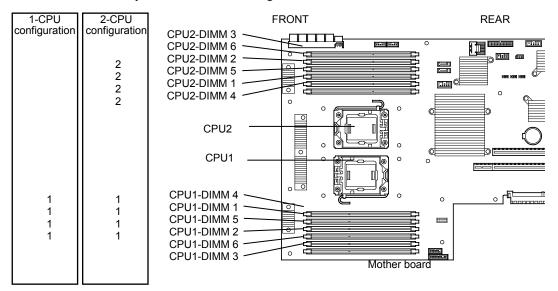
The LockStep feature can be used under the following conditions:

- Install four DIMMs in four DIMM sockets that configure a LockStep set.

- All DIMMs to be used for LockStep set should have the same capacity.

- Run SETUP (described on page 4-2), change parameters appropriately in the menu selected as shown below, save the settings and exit from SETUP.

  Select [Advanced] $\rightarrow$ [Memory Configuration] $\rightarrow$ [Memory RAS Mode] $\rightarrow$ [Lock Step].

- After SETUP finishes, rerun SETUP and make sure that the installed DIMM status is [Lock Step].

- Install memory devices in the following order:

1-CPU configuration	2-CPU configuration
	2
	2
	2
	2
1	1
1	1
1	1
1	1

FRONT   REAR

CPU2-DIMM 3
CPU2-DIMM 6
CPU2-DIMM 2
CPU2-DIMM 5
CPU2-DIMM 1
CPU2-DIMM 4

CPU2

CPU1

CPU1-DIMM 4
CPU1-DIMM 1
CPU1-DIMM 5
CPU1-DIMM 2
CPU1-DIMM 6
CPU1-DIMM 3

Mother board

The following LockStep cannot be configured:

- LockStep between memory channels of different memory controllers (CPU)

Notes on configuring LockStep

In LockStep configuration, [Memory RAS Mode] menu is changed from "LockStep" to "Independent" in the following cases:

- When you additionally install DIMMs that unable to configure LockStep
- When you remove DIMMs that takes down the LockStep
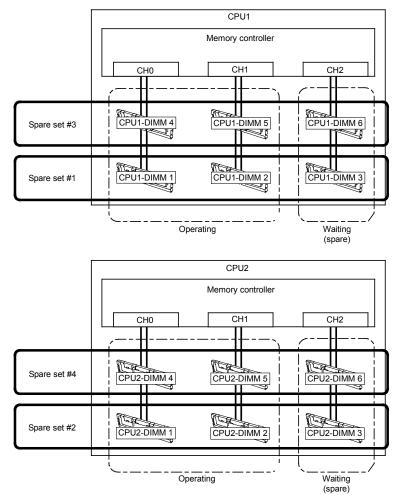
Memory sparing

Memory sparing is a feature whereby channel 2 of the memory controller in each CPU is designated as a "spare" channel and the DIMMs that use that channel are put on standby so that operations can be automatically switched to a standby DIMM if a correctable error occurs in one of the DIMMs operating under the control of the memory controller, allowing processing to continue unimpeded.

IMPORTANT:

- The memory sparing feature is not supported by the N8100-1654F/1660F.

- Additional memory sticks (N8102-371(F)/372(F)/373(F)/374(F)/375(F)/428(F)/429(F)) are required to use the memory sparing feature.

- To use the memory sparing feature, all DIMMs to be installed must be of the same model number.
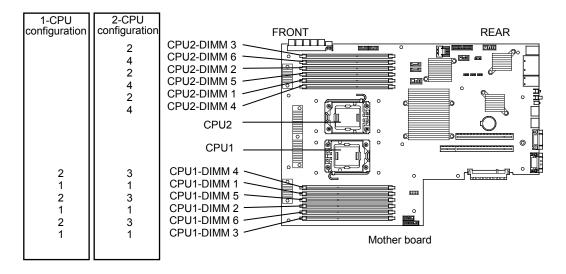
Example: Memory sparing in a 2-CPU configuration

> **NOTE:** The capacity of the DIMMs recognized by the operating system is less than the DIMMs' physical capacity. The capacity recognized by the operating system depends on the number of memory sticks inserted and the capacity of each stick.

Observe the following when using the memory sparing feature:

- The capacity of the additional memory sticks (DIMMs) must the same as the capacity of the memory sticks installed in the server.
- Launch the SETUP utility (referring to System BIOS SETUP on page 4-2) and change the parameter below. Save the changed parameter and exit SETUP.
  [Advanced] → [Memory Configuration] → [Memory RAS Mode] → [Sparing]
- After exiting SETUP, launch SETUP again and check that the added DIMMs have the status "Sparing".
- Insert the additional memory sticks in the following sequence:

1-CPU configuration	2-CPU configuration	
	2	CPU2-DIMM 3
	4	CPU2-DIMM 6
	2	CPU2-DIMM 2
	4	CPU2-DIMM 5
	2	CPU2-DIMM 1
	4	CPU2-DIMM 4
		CPU2
		CPU1
2	3	CPU1-DIMM 4
1	1	CPU1-DIMM 1
2	3	CPU1-DIMM 5
1	1	CPU1-DIMM 2
2	3	CPU1-DIMM 6
1	1	CPU1-DIMM 3

FRONT   REAR

Mother board

Memory sparing cannot be used in the following case:
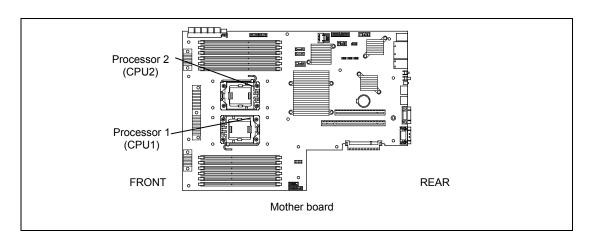
- DIMMs of different model number are installed in the same spare set.

Processor (CPU)
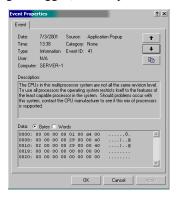
The server may have another CPU installed in addition to the standard CPU.

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 pins by a bare hand or place the CPU directly on the desk. For static notes, see page 9-3.

- Do not operate the system until confirming that the additionally installed CPU is in normal state.

- Make sure to use the CPU authorized by NEC. Installing a third-party CPU might cause a failure of the CPU as well as the server. Repair of the server due to failures or damage resulted from installing such a board will be charged.

Mother board

NOTE: If the different revision of the processor is installed in the multiprocessor system, Windows logs the following information every startup. If this message is logged, it is no problem for operation.

Installation
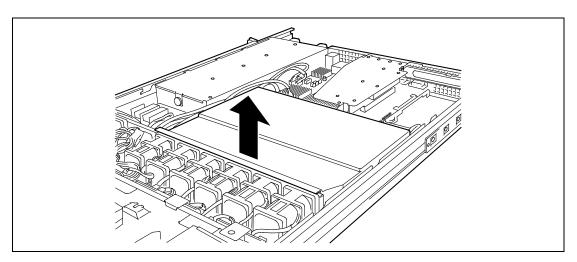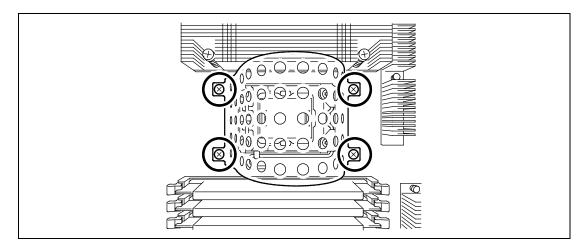
Take the following steps to install the CPU.

1. See page 9-4 to prepare.

2. Pull out the server from the rack (as described on page 9-4).

3. Remove the top cover (as described on page 9-25).

4. Remove the fan duct from the chassis.

> **IMPORTANT:** Make sure not to damage the internal cables.
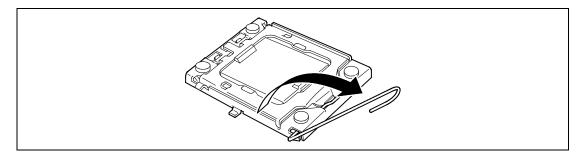
5. Locate the CPU socket which you are going to install CPU.

6. Remove the four screws, and remove the CPU dummy cover.
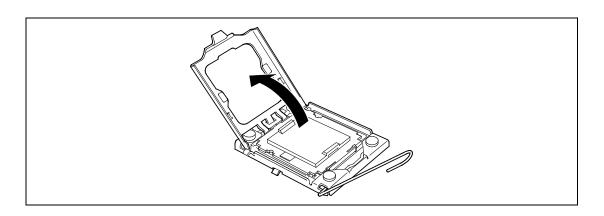
> **IMPORTANT:** Keep the removed cover for future use.

7. Open the socket lever by pushing the lever down and away from the socket.
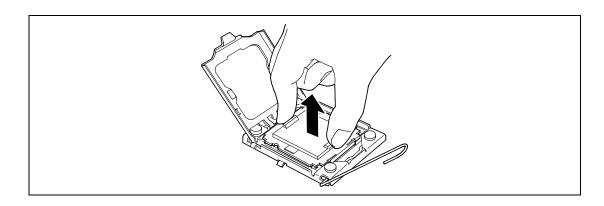
8. Lift the load plate.

> **IMPORTANT:** Do not touch the socket contacts.
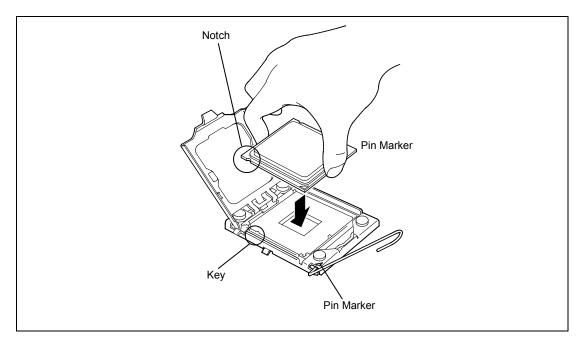
9. Remove the protective socket cover from the load plate.

> **IMPORTANT:** Do not discard the protective socket cover. Always replace the socket cover if the processor is removed from the socket.

10. Hold a new processor with your thumb and index fingers and place it on the socket carefully as shown in the figure below.
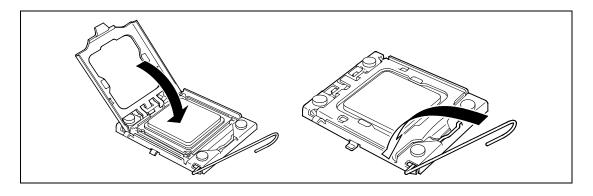
NOTES:

■ Align notches with the socket.

■ Lower the processor straight down without tilting or sliding it in the socket.
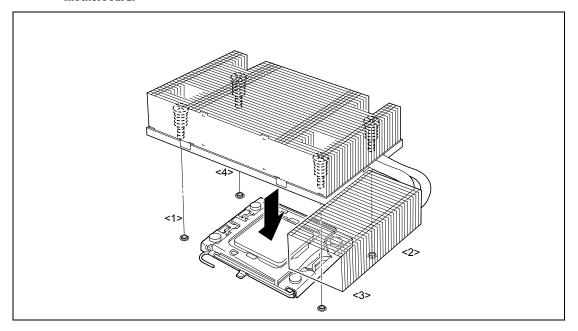
IMPORTANT: Hold the processor only at the edges, being careful not to touch the bottom of the processor.

11. Slightly press the processor on the load plate, close the load plate, and then engage the socket lever.
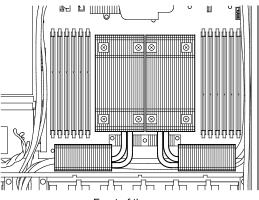
12. Put the heat sink on CPU and fix the heat sink with four screws.

Make sure that the screw aligns with the screw hole. If not, the screw may damage the motherboard.

NOTE: Be aware of direction of heat sink (see figure below).

Rear of the server
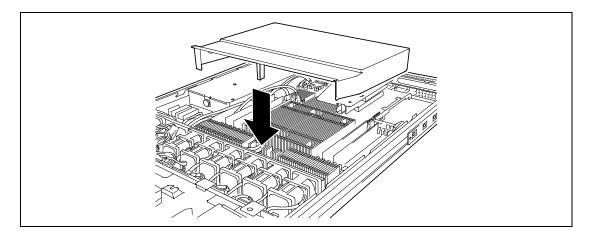
Front of the server

13. Make sure that the heat sink is level.
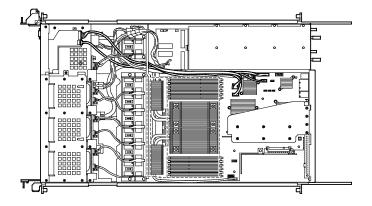
NOTES:

- If the heat sink is not level, remove it, and then install it again. The following probably causes the heat sink not to be level:
  - The CPU is not positioned correctly.
  - All screws are not completely tightened.

- Do not move the secured heat sink.

14. Reinstall the fan duct.

NOTES:

- Check to see that the fan duct is firmly installed with no clearance between the duct and chassis.

- Check to see that no cable is caught between the duct and the motherboard.
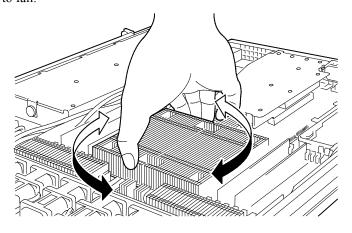
15. Install the covers you removed previously.

16. Power on the server, start the SETUP utility, and set "Processor Retest" of "Processor Settings" on the Main menu to "Enable".

17. Verify that POST displays no error messages.

If POST displays an error message, take a note on the message and see the POST error messages listed in Chapter 8.

Removal

To remove the CPU, prepare the removal referring to steps 1 and 4 in the installation procedure and do the reverse procedure of steps 12 to 7.

> ### IMPORTANT:
>
> ■ Do not remove any CPU unless it is failed.
>
> ■ After the operation, heat may make the cool seat at the bottom of the heat sink adhere to the CPU. To remove the heat sink from the CPU, first turn the heat sink to the left and right lightly to make sure that the heat sink can be apart from the CPU. Removing the heat sink with it adhering to the CPU might cause the CPU and/or socket to fail.
>
>

Do the following procedure if a CPU is removed (or replaced).

1. When a CPU is replaced, select [Advanced] → [Processor Configuration] → [Processor Information] to confirm that the CPU ID, L2 Cache RAM, and L3 Cache RAM of the additional CPU are defined normally (described on page 4-11).
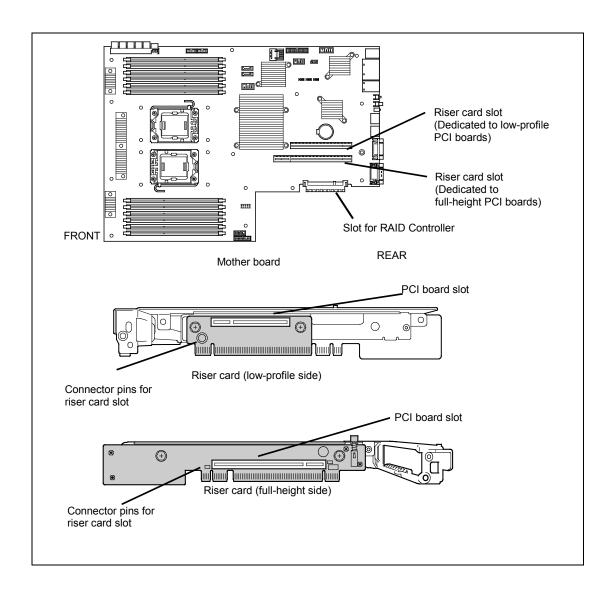
PCI Card

On the motherboard, the server has a riser card assembly that enables installation of PCI cards and a RAID controller-dedicated slot that enables installation of a RAID controller. The riser card assembly can hold one full-height PCI board, one low-profile PCI board, and one RAID Controller (for a total of three PCI boards).

Insert PCI cards for network extension and file device function extension into PCI card slots in each riser card.

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 card terminals or on-board parts by a bare hand or place the PCI card directly on the desk. For static notes, see page 9-3.

- Some restrictions are imposed on the combination of PCI cards which can be installed in the server. Contact your service representative for details.

- A riser card is designed for installing only low-profile PCI cards or full-height PCI cards. Before installing a PCI card, make sure of the card specification.

- If the SCSI controller, RAID controller, LAN card (for network boot), or Fibre Channel controller is not connected with the hard disk drive that contains OS, be sure to disable Option ROM for that card. See page 4-2 for details.

Riser card slot
(Dedicated to low-profile
PCI boards)

Riser card slot
(Dedicated to
full-height PCI boards)

Slot for RAID Controller

FRONT

Mother board

REAR

PCI board slot

Riser card (low-profile side)

Connector pins for
riser card slot

PCI board slot

Riser card (full-height side)

Connector pins for
riser card slot

Notes

Observe the following notes on installing/removing a PCI card:

- Do not touch the terminals of the riser cards and the leads of electronic components with your bare hand. Fingerprints and dust left on them cause the server to malfunction due to a connection failure or damage to the leads.

- A riser card is designed for installing only low-profile PCI cards or full-height PCI cards. Before installing a PCI card, make sure of the card specification.

- PCI slot number "1C" is assigned to the riser card for low-profile PCI cards, "1B" is assigned to the riser card for full-height PCI cards, and "0A" is assigned to the RAID controller-dedicated slot.

- The system detects the boot devices in order of the PCI bus slots 1B (full-height PCI card) and then 1C (low-profile PCI card).

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

PCI device	Bus number	Device number	Function number
Onboard NIC1	1h	0	0
Onboard NIC2	1h	0	1
Slot 1C	5h	0	X
Slot 1B*	3h	0	X
Slot 1B (N8116-23)	4h	0	X
RAID-dedicated slot	7h	0	X

  * A different bus number might be assigned depending on which PCI board is inserted into this slot.

- Set "Disabled" for the optional ROM of a LAN device not to be booted by using the BIOS SETUP utility.

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

- If a bootable PCI card (e.g., a RAID controller, SCSI controller, or LAN card) is additionally installed, the boot priority is changed. After the additional installation, start the BIOS SETUP utility, select [Boot] and set the new boot priority.

- Contact your service representative for the acceptable optional PCI card.

- If a device that can be booted (PCI card, USB device, etc.) is added, the boot priority might change. If the priority has changed, use [Hard Drive BBS Priorities] on the [Boot] menu of BIOS SETUP to specify a higher priority for the boot device.
  [Boot] → [Hard Drive BBS Priorities] → Check the display.

  If the boot device is an HDD under N8103-129/130:
  (Bus 07 Dev 00) PCI RAID Adapter

Installation
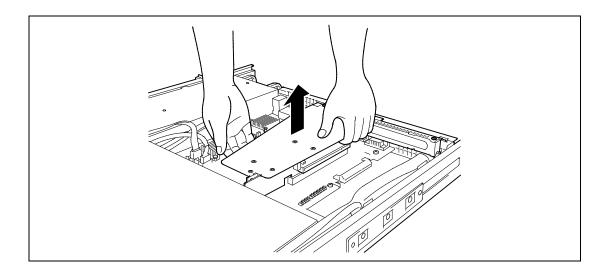
Take the following steps to install a PCI card on the riser card:

> **IMPORTANT:** The full-height riser card is equipped with an "insulator (black)" to protect PCI cards. Do not remove the insulator, and handle it carefully. The insulator is not shown in the figures in this manual for simplifying the illustrations.

> **NOTES:**
> - Each riser card supports low-profile or full-height PCI cards. Before installing a PCI card, confirm that the type of the PCI card.
> - When installing a PCI card, confirm that the card connector matches the connector of the riser card.
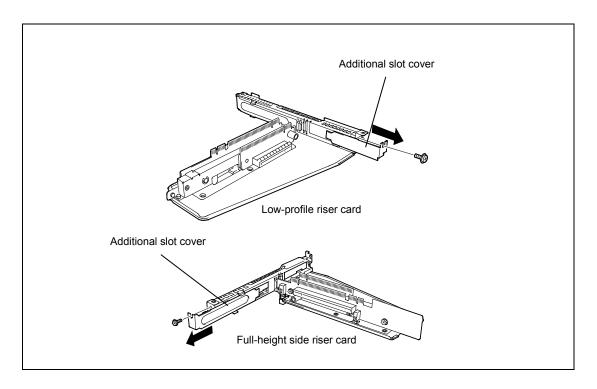
1. See page 9-4 to prepare.

2. Pull out the server from the rack (as described on page 9-4).

3. Remove the top cover (as described on page 9-25).

4. Remove the screws holding the riser card in place.

5. Grasp a handle on the riser module assembly and lift straight up and remove the riser module assembly from the server.

> **NOTE:** Be very careful not to contact the other component.
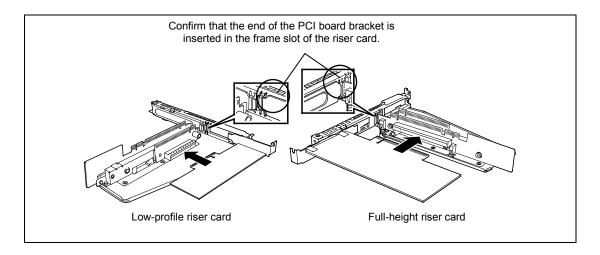
6. Remove the screw from the riser card, and remove the additional slot cover.

> **NOTE:** Keep the removed additional slot cover for future use.

7. Install the PCI board on the riser card.

Align the PCI board terminal section with the riser card slot, and firmly push the PCI board until it is fully seated.

IMPORTANT:
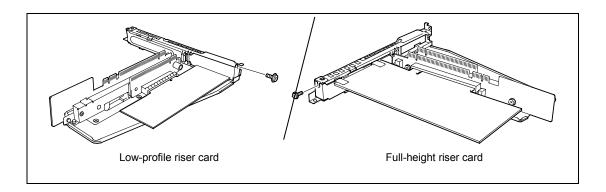
- Do not touch the terminals of the riser cards and PCI cards with your bare hand. Fingerprints and dust left on them cause the server to malfunction.

- If you are unable to install a PCI card correctly, remove it, and then install it again. Be careful not to apply excess force to a PCI card or riser card. Doing so may damage the card.

NOTES:

- Confirm that the end of the PCI card bracket is inserted in the frame slot of the riser card.

- Some PCI cards have terminal section that extends over the mating connector.

8. Secure the PCI card with the screw you removed in step 5.

> **IMPORTANT:** This step is to protect the terminals of the riser card from dust or fingerprints. Dust and fingerprints left on them cause the server to malfunction.

Low-profile riser card   Full-height riser card
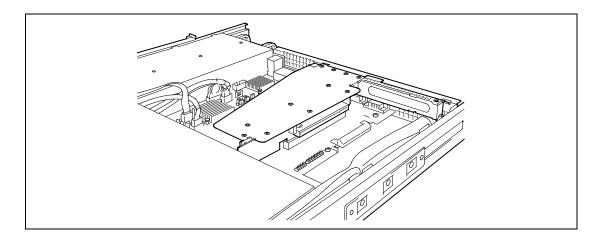
9.   Insert the riser module assembly into the slot on the motherboard.

Align the riser card terminal section with the slot on the motherboard, and firmly push the riser module until it is fully seated.

> ### NOTES:
>
> ■ There are catches on the riser card frame that are used to secure the riser card to the cabinet. When inserting the riser card, confirm that the catches are correctly fit into the holes on the rear of the cabinet. After the insertion, push the riser card with your fingers until you cannot see any part of the riser card terminal section. The riser card is now fully seated in the slot.
>
> ■ Pay attention not to damage the components on motherboard with the riser card when inserting it into the slot.

10.   Use screws to fix the riser card in place.

11.   Install the components you removed previously.

12.   Verify that POST displays no error messages.

If POST displays an error message, take a note on the message and see the POST error messages listed on page 8-10.

Removal
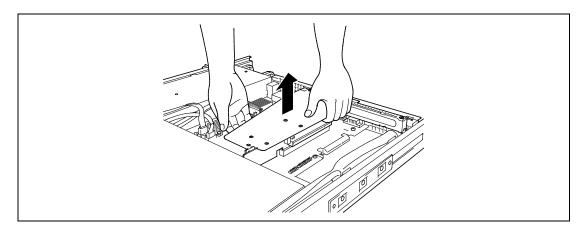
Remove a PCI card in reverse order of the installation steps. After removal, use the [Boot] menu of the BIOS setup utility to set the boot order (as described on page 4-34).

Installing RAID Controller

Take the following steps to install the optional RAID Controller in the RAID Controller slot.
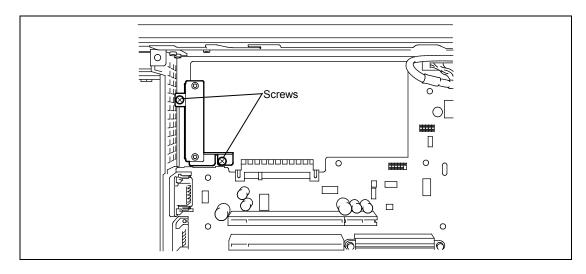
2.5-inch RAID controller

1. See page 9-4 to prepare.

2. Pull out the server from the rack (as described on page 9-4).

3. Remove the top cover (as described on page 9-25).

4. Remove the screws holding the riser card in place.
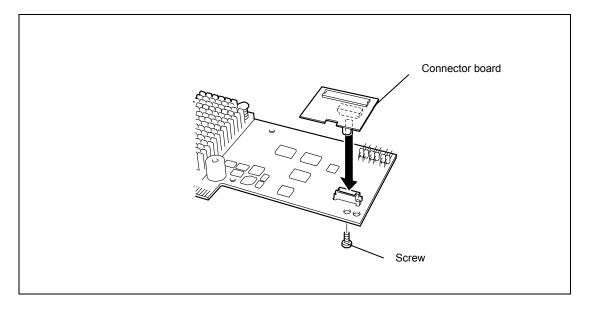
5. Remove the riser card.

> **IMPORTANT:** Carefully remove the riser card so as not to contact any other components.
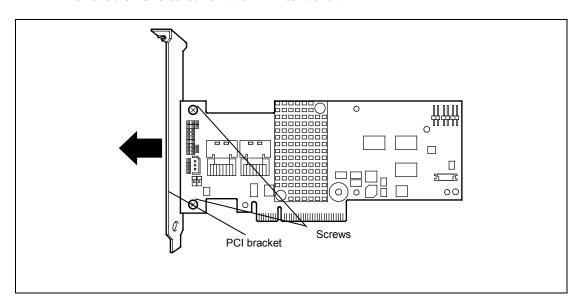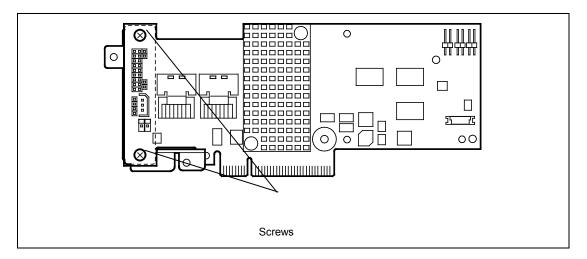
6. Remove the two screws from the bracket, and then remove the bracket.

7. Remove the PCI bracket from the RAID controller.

PCI bracket

Screws

8. Attach the RAID Controller to the bracket that was removed from the server chassis.

Screws

9. Install the RAID Controller in the server chassis, and secure it with the screws that were used to secure the bracket.

Screws

10. Install the components you removed.

3.5-inch RAID controller

1. See page 9-4 to prepare.

2. Pull out the server from the rack (as described on page 9-4).

3. Remove the top cover (as described on page 9-25).

4. Remove the screws holding the riser card in place.

5. Remove the riser card.

> **IMPORTANT:** Carefully remove the riser card so as not to contact any other components.
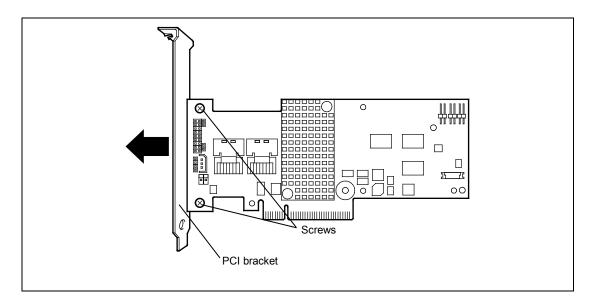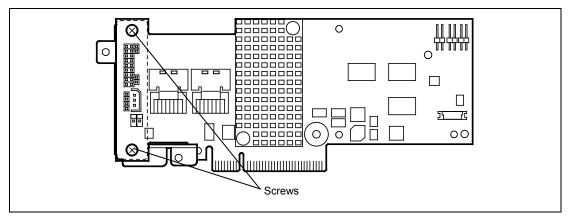
6. Remove the seven screws from the bracket, and then remove the bracket.
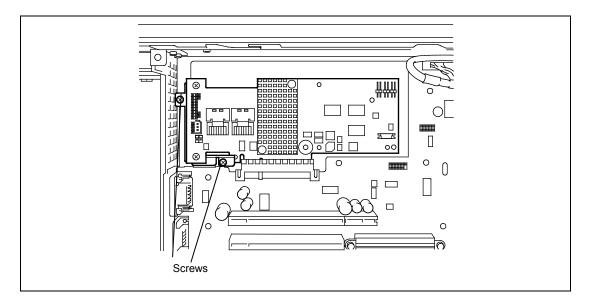
7. Remove the PCI bracket from the RAID controller.
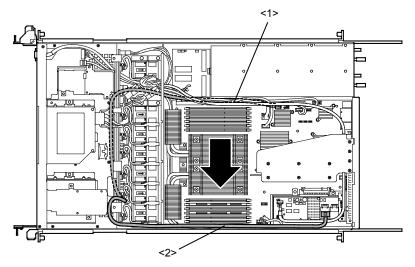
8. Attach the RAID Controller to the bracket that was removed from the server chassis.

Use the screws that were used for securing the PCI bracket.

Screws

9. Install the RAID Controller in the server chassis, and secure it with the screws that were used to secure the bracket.

Screws

10. Reroute the cable as shown in the figure below and connect the cable to the RAID controller. The original cable routing is indicated by <1> in the figure, and the new routing is indicated by <2>.

11. Install the components you removed.

Removing RAID Controller
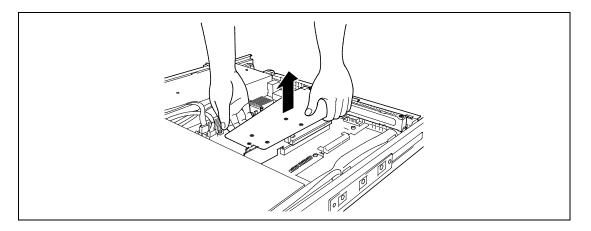
Remove the RAID Controller in reverse order of the installation steps.

Installing Additional Battery for RAID Controller

Take the following steps to install an additional battery for RAID controller.
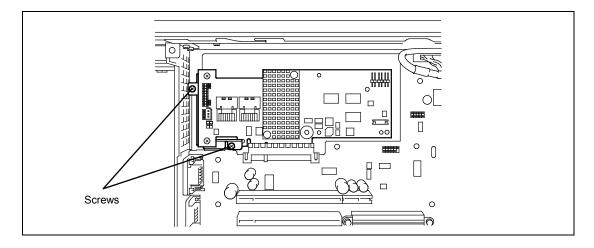
2.5-inch disk model

1. See page 9-4 to prepare.

2. Pull out the server from the rack (as described on page 9-4).

3. Remove the top cover (as described on page 9-25).
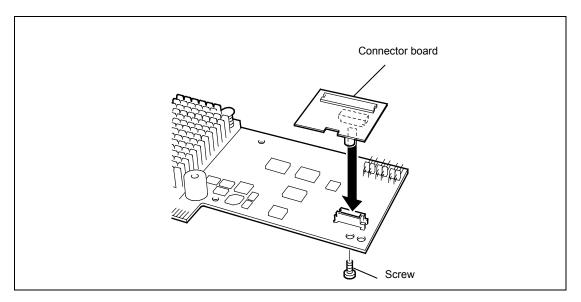
4. Remove the riser card.

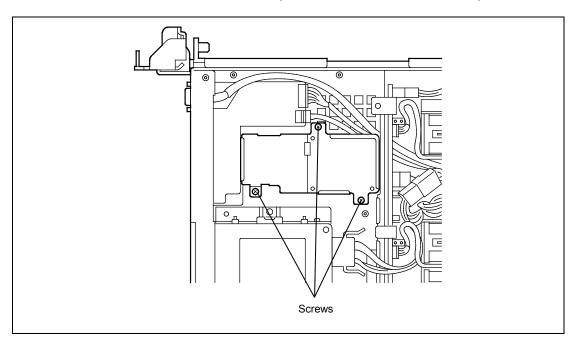> **IMPORTANT:** Carefully remove the riser card so as not to contact any other components.

5. Disconnect cables from the RAID controller.

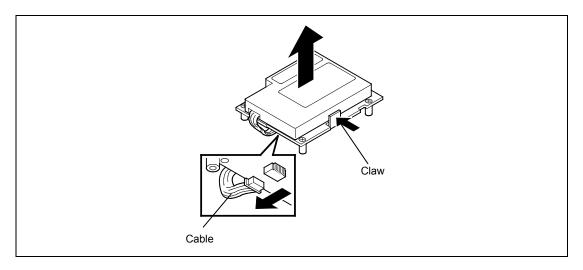6. Remove screws from the RAID controller, and then remove the RAID controller.

Screws
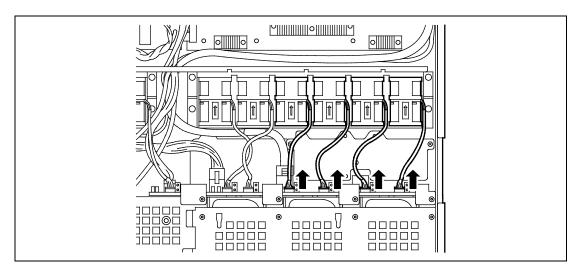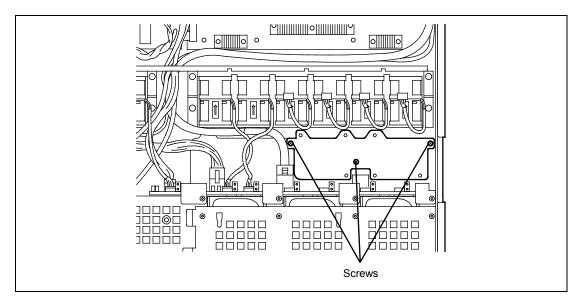
7. Install the connector board provided with the additional battery to the RAID controller.
Use screws that come with the additional battery.

8. Secure the RAID Controller to the server chassis.

9. Disconnect fan cables (four cables at right side viewed from the front).
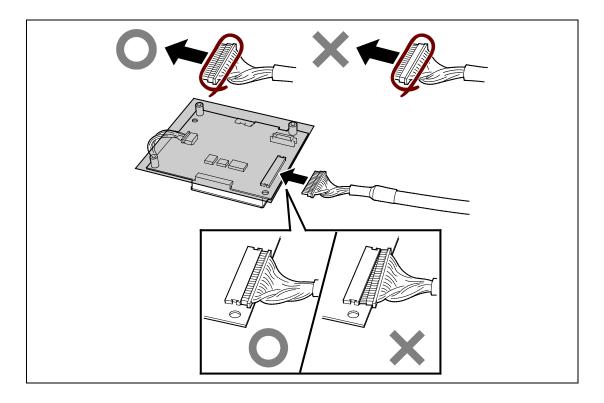
10.   Remove the three screws from the battery bracket, and then remove the battery bracket.
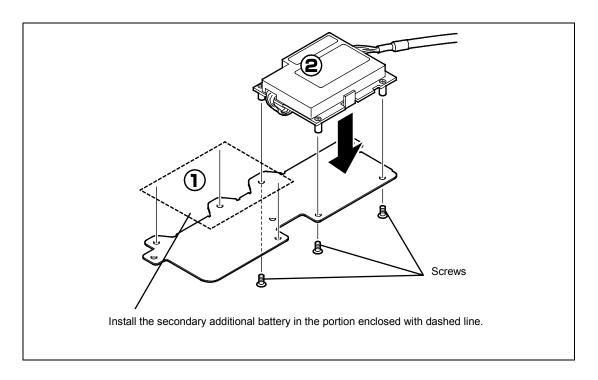
Screws

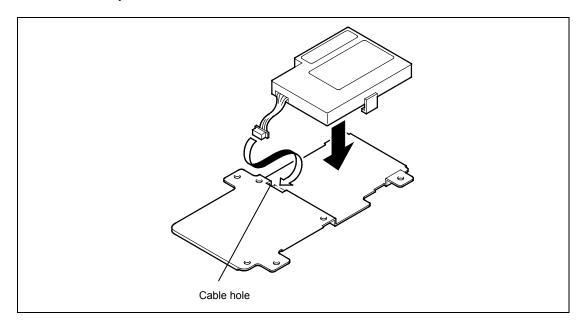**11.**   Connect the cable to the additional battery.
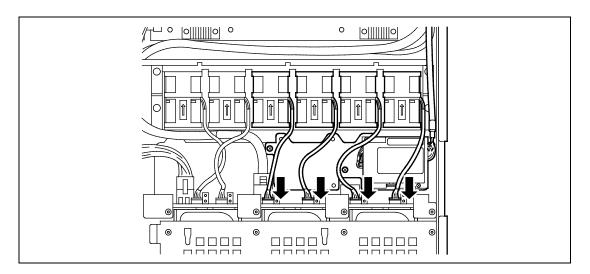
Be aware of the face of the connector according to the figure below.
Connect a cable to the connector with matching their markings.

12. Secure the additional battery to the battery bracket with three screws.

Use screws that come with the additional battery.

Install the secondary additional battery in the portion enclosed with dashed line.
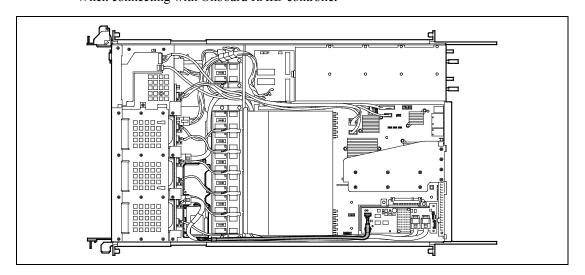
13. Secure the battery bracket to the server chassis with three screws, and connect the fan cables.
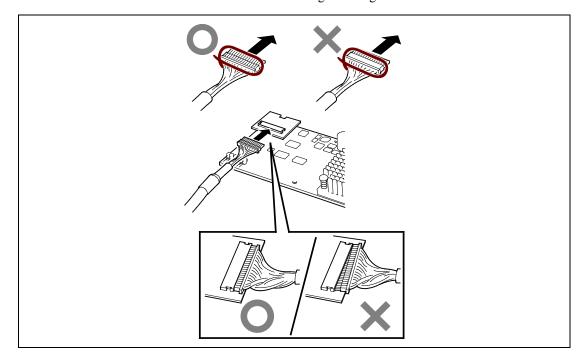
14. Route the cable as shown in the figure below.

When connecting with Onboard RAID controller

15. Connect the cable to the connector board installed on the RAID controller.

Be aware of the face of the connector according to the figure below.
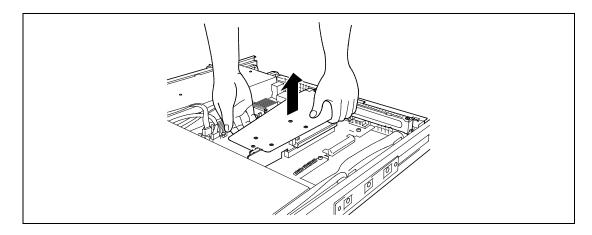
16. Install the components you removed previously.

3.5-inch disk model
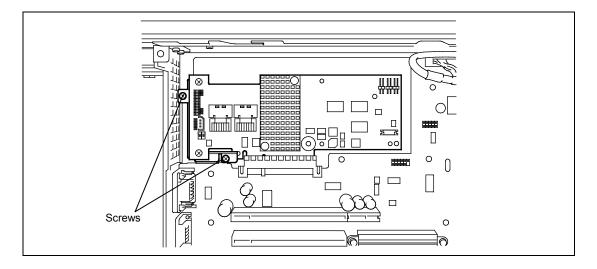
N8103-129/130:

1. See page 9-4 to prepare.

2. Pull out the server from the rack (as described on page 9-4).

3. Remove the top cover (as described on page 9-25).

4. Remove the riser card.

> **IMPORTANT:** Carefully remove the riser card so as not to contact any other components.

5. Disconnect cables from the RAID controller.

6. Remove screws from the RAID controller, and then remove the RAID controller.

Screws

7. Install the connector board provided with the additional battery to the RAID controller.

Connector board

Screw

8. Secure the RAID Controller to the server chassis.

9. Remove the three screws from the battery bracket, and then remove the battery bracket.

Screws
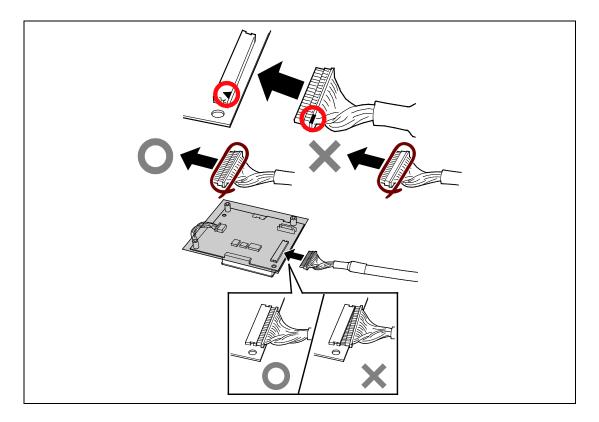
10. Split the additional battery so that the battery is apart from the base board by pushing the claw in the direction of arrow mark, and then disconnect the cable.

Claw

Cable

11. Connect the cable to the additional battery.
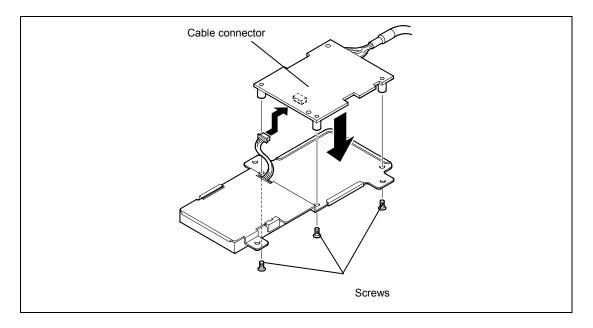
Be aware of the face of the connector according to the figure below.
Connect a cable to the connector with matching their markings.
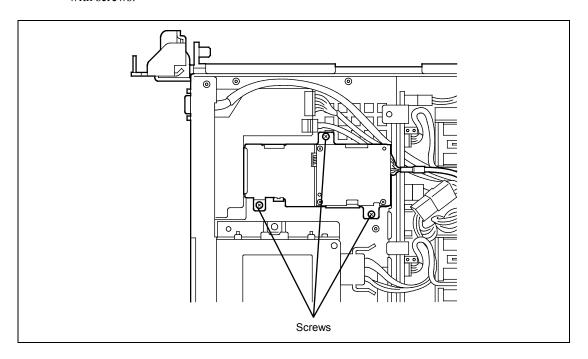
12. Pass the battery cable through the hole on the battery bracket, and then install the battery on the battery bracket.

Cable hole
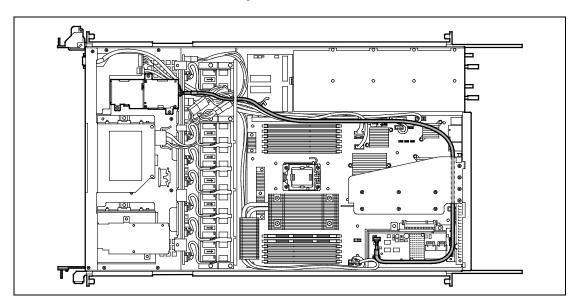
13. Connect the cable to the base board, and then secure the base board to the additional battery with the provided screws.

Cable connector

Screws
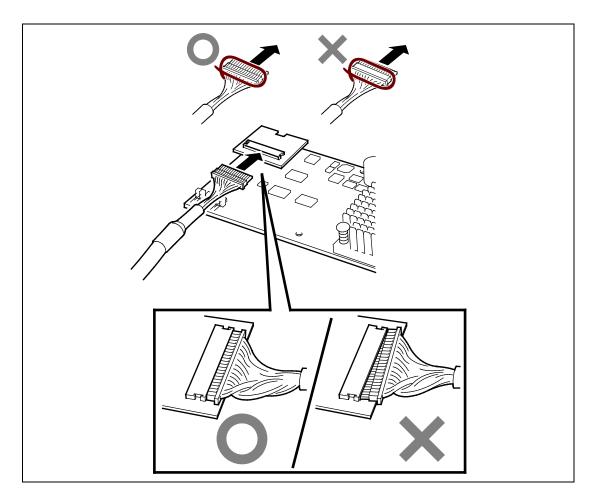
14. Secure the battery bracket on which the additional battery is installed to the server chassis with screws.

Screws

15. Route the cable as shown in the figure below.

16. Connect the cable to the connector board installed on the RAID controller.

Be aware of the face of the connector according to the figure below.

17. Install the components you removed previously.

Removing Additional Battery for RAID Controller

Remove the additional battery for RAID Controller in reverse order of the installation steps.

Use of Internal Hard Disk Drives in the RAID System

Using the RAID Controller allows you to use hard disk drives in the device bays of the server and those in the optional expansion disk cabinet in the RAID System.

IMPORTANT:

- Making hard disk drives in the RAID System or changing the RAID level initializes hard disk drives. If the hard disk drive to be configured in the RAID System has your valuable data stored, make sure to make a backup copy of the data in another hard disk drive before installing the RAID Controller and configuring the RAID System.

- More than one hard disk drive is required to configure a Logical Drive.

- Use hard disk drives of the same capacity and performance (e.g., revolution) for each pack to configure them in the RAID System.
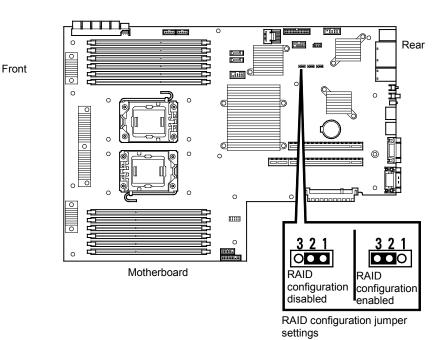
NOTES:

- Make sure of RAID levels and hard disk drives available for the RAID Controller to choose an appropriate controller.

- A Logical Drive except for RAID0 increases disk reliability. However, the actually available capacity becomes smaller than the total hard disk drive capacity in the Logical Drive.

You can build a RAID System by using the Onboard RAID Controller (LSI Embedded MegaRAID^{TM}) or optional RAID Controller (N8103-129/130).

Onboard RAID Controller (LSI Embedded MegaRAID™)

If the setting of the RAID configuration jumper switch on the motherboard is changed, the internal hard disk drives can be detected as RAID hard disk drives. See the figure below.

NOTE: The RAID system is disabled in the factory settings.

RAID configuration jumper settings

When the jumper setting is changed, the internal hard disk drive is recognized by the BIOS setup utility as a RAID system drive.
Select [Advanced] → [SATA Configuration] → [SATA Mode] and confirm that [RAID Mode] is shown.
For details, see *System BIOS (SETUP)* (on page 4-2).

When these settings are changed, the LSI Software RAID Configuration Utility is used to build a RAID system. For details, see RAID System Configuration (on page 4-38).

> **NOTE:** When the Express Setup program provided on the included EXPRESSBUILDER DVD is used, the RAID system is automatically built. In addition, if the operating system to be installed is Windows, the processing up until the operating system is installed can be performed without interruption.

Optional RAID Controller (N8103-129/130)

Your server can include the optional RAID Controller (N8103-129/130). The optional RAID Controller can control the internal hard disk drives as the RAID System. To use the hard disk drives in a RAID System, reconnect the hard disk drive interface cable on the motherboard.
At the factory, the interface cable is connected to the SATA HDD connector on the motherboard. Refer to the manual coming with optional RAID Controller (N8103-129/130) for details.

> **IMPORTANT:** The RAID Controller 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 RAID controller. Do not touch the RAID Controller terminals or on-board parts by a bare hand or place the RAID Controller directly on the desk. For static notes, see page 9-3.

> **NOTE:** Before installing an optional RAID controller, run the SETUP utility, select [Advanced] → [PCI Configuration], and confirm that [Enabled] is set for the parameter [PCI Slot xx ROM] (xx: PCI slot number).

Installation

See "PCI Card" in this chapter and manual that comes with the optional RAID Controller for the installation of a RAID Controller (N8103-129/130).

> **IMPORTANT:**
>
> - A riser card for low-profile PCI card differs from the one for full-height PCI card. Before installing a PCI card, make sure of the board specification.
>
> - Some RAID Controller has LED cable connector to be used for indication of disk access. However, this server is not equipped with LED cable connector.
>
> - To use internal hard disk drives in RAID System by connecting the RAID Controller to the full-height riser card, first connect the cable, and then connect the riser card with motherboard.
>
> - When the RAID Controller is connected, the boot priority specified in BIOS SETUP utility must be eighth or younger. If specified ninth or later, the configuration menu of RAID Controller will fail to start.

Removal

To remove the optional RAID Controller (N8103-129/130), perform the above procedure in reverse.

Notice

Observe the following notes on configuring a RAID System:

- Hard disk drives used in the RAID System configuration should have the same disk revolution rate and capacity in each disk array. (The minimum number of required disks depends on the configuration of RAID (Redundant Arrays of Inexpensive[Independent] Disks).)
- Select/set a RAID level "RAID0", "RAID1", "RAID5", "RAID6", "RAID10" or "RAID50".

When installing a system in an internal hard disk drive, you should use "Express Setup" to perform all the procedures for RAID System configuration, OS installation, and then OS setup.

Use Express Setup even when not installing a system. Start Express Setup, select [OS Selection] → [Others]. The installer automatically performs all the procedures for RAID System configuration, and then maintenance utility installation.

When making the setup in manual mode, use the RAID System configuration utility in the chip on the board. You can start the utility during execution of POST that automatically starts immediately after you turn on the server power switch. For details, see the document in the NEC EXPRESSBUILDER DVD provided with the server. (The utility varies depending on the RAID controller.) For details on the data transfer rate, RAID, and RAID System configuration, see the manual provided with the RAID Controller (N8103-129/130) as well as page 4-38.
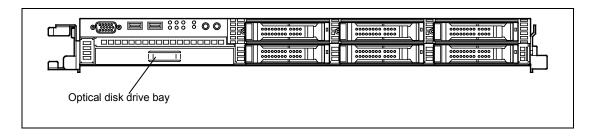
> **IMPORTANT:** When N8103-129/130 is installed, do not let the system enter the hibernation or standby mode.
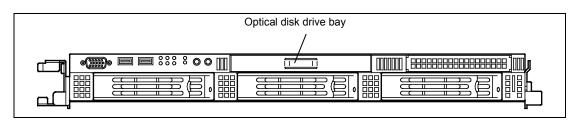
Optical Disk Drive

You may replace the factory-installed optical disk drive with an optical disk drive.

> **IMPORTANT:** Be sure to use the optical disk drive authorized by NEC.

2.5-inch Disk Model

Optical disk drive bay

3.5-inch Disk Model

Optical disk drive bay
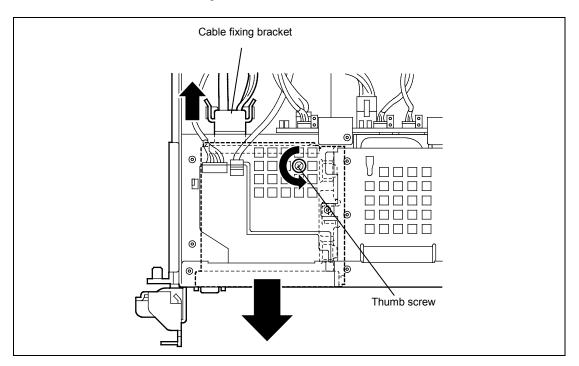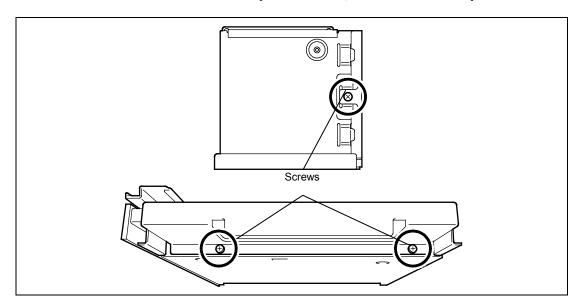
Installation Procedure

Take the following steps to install the optical disk drive.

2.5-inch disk model
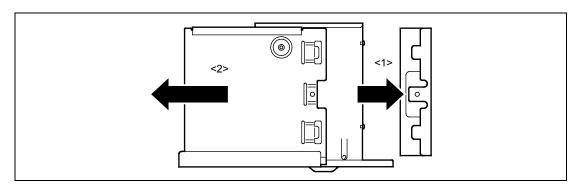
1. See page 9-4 to prepare.

2. Pull out the server from the rack (as described on page 9-4).

3. Remove the top cover (as described on page 9-25).

4. Remove the cable while holding both ends of cable fixing bracket of the optical disk drive.

5. Loosen the thumb screw, and pull out the optical disk drive bracket to the direction of the arrow mark shown in the figure below.
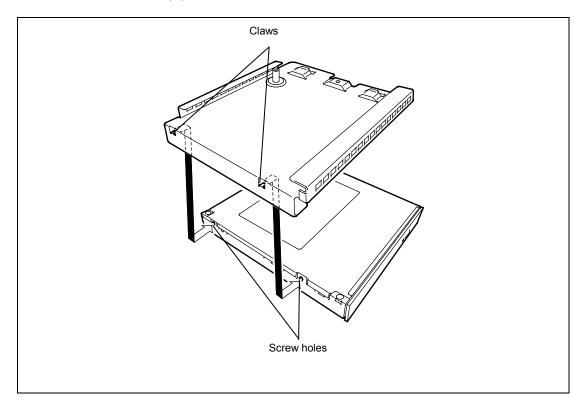

Cable fixing bracket

Thumb screw

6. Remove the three screws from the optical disk drive, and then remove the optical disk drive.
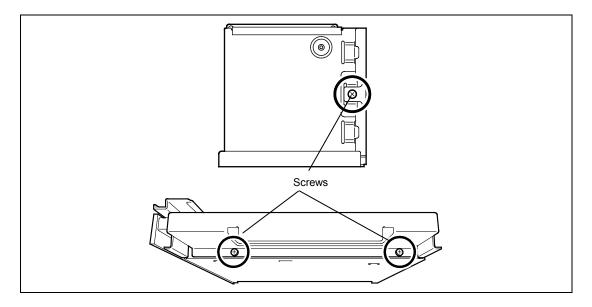

Screws

7. Remove the optical disk drive bracket to the direction of the arrow marks shown in the figure below.
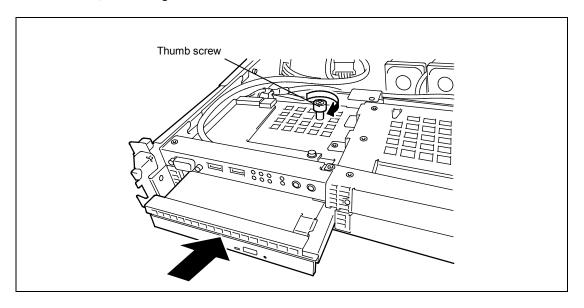

<2>   <1>

8. Align the screw holes on the optional DVD SuperMULTI drive with claws on the optical disk drive bracket (A).

Claws

Screw holes
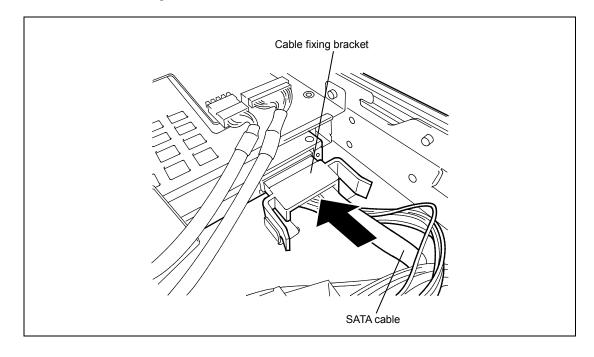
9. Secure the drive with the three screws that were used for optical disk drive bracket (B).

Screws

10. Install the optical disk drive bracket with optional DVD SuperMULTI drive mounted to the server, and then tighten the thumb screw to secure.

Thumb screw

11. Connect the SATA cable to optional DVD SuperMULTI drive. Then, fix the SATA cable with cable fixing bracket.

Cable fixing bracket

SATA cable

12. Install the components you removed previously.

3.5-inch Disk Model

1. See page 9-4 to prepare.

2. Pull out the server from the rack (as described on page 9-4).

3. Remove the top cover (as described on page 9-25).

4. Remove the cable while holding both ends of cable fixing bracket.

5. Remove the screw from the optical disk drive bracket, and then remove the optical disk drive bracket.

   Move the bracket to the left, viewed from the front of server.

Cable fixing bracket

Screw   Optical disk drive bracket
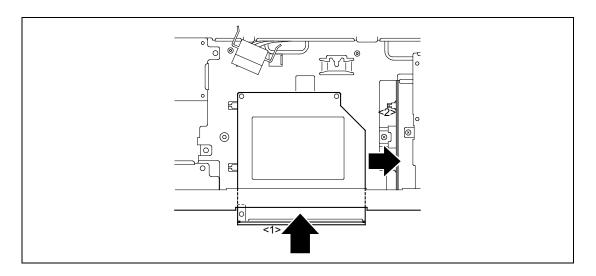
6. Remove the optical disk drive by sliding it to the direction shown by the arrow mark in the figure below.

<1>

<2>
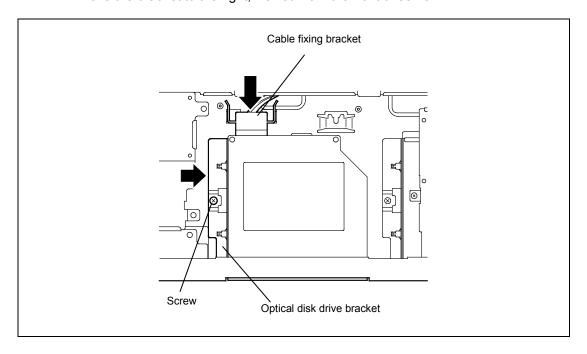
7. Insert the optional DVD SuperMULTI drive into the slot.

Align the screw holes on the optional DVD SuperMULTI drive with claws on the slot, and then move the drive to the right.

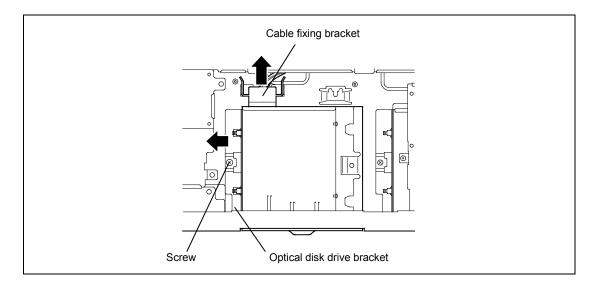**8.** Secure the optional DVD SuperMULTI drive with optical disk drive bracket. Then, tighten the screw.

Move the bracket to the right, viewed from the front of server.

9.   Connect the SATA cable to optional DVD SuperMULTI drive. Then, fix the SATA cable with cable fixing bracket.

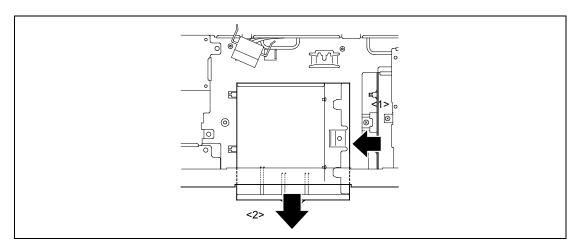**10.**   Install the components you removed previously.

Appendix A

Specifications

2.5-inch disk model

Item			Express5800/R120b-1					
			Diskless model					
			N8100-1654F	N8100-1655F	N8100-1656F	N8100-1657F	N8100-1658F	N8100-1659F
CPU	Type		Intel® Xeon® Processor E5506	Intel® Xeon® Processor E5620	Intel® Xeon® Processor E5640	Intel® Xeon® Processor L5640	Intel® Xeon® Processor X5670	Intel® Xeon® Processor X5680
	Clock		2.13GHz	2.40GHz	2.66GHz	2.26GHz	2.93GHz	3.33GHz
	Standard		1					
	Maximum		2					
	3rd cache		4MB	12MB				
	Number of cores/ number of threads		2/2	4/8		6/12		
Chipset			Intel® 5520					
Memory	Standard		–					
	Maximum		Registered DIMM: 192GB (16GB x 12)*¹					
	Memory module		DDR3L-1333 Registered DIMM (1/2/4/8GB), DDR3L-1066 Registered DIMM (16GB)					
	Maximum clock		800MHz	1066MHz			1333MHz	
	Error check, correction		ECC, x4/LockStep mode (x8) SDDC					
	Online spare memory		–	Supported				
	Memory mirroring/ memory RAID*²		Supported					
Auxiliary storage	Drive bay	Standard	–					
		Maximum*³	HDD: SATA 6TB (1TB x6), SAS 5.4TB (900GB x6), SSD: SATA 600GB (100GB x6)					
		Hot-plug	Supported					
	Interface level/ RAID system		SATA 3Gb/s: RAID 0/1/10 (standard*³), RAID 5/6/50 (option) SAS 6Gb/s: RAID 0/1/5/6/10/50 (option)					
	Optical disk drive		Built in/external drive (option)*⁴, ⁵					
	FDD		External drive (option)*⁵					
	Device bay		1 x 3.5-inch model tape device bay					
Additional slots	Supported slot		1 x PCI Express 2.0 (x 16 lanes, x 16 sockets) (Full-height, 175mm) 1 x PCI Express 2.0 (x 8 lanes, x 8 sockets) (Low-profile, 167.6mm) 1x PCI EXPRESS 2.0 (x4 lanes, x8 sockets) (dedicated RAID slot)					
Graphics	Graphics accelerator/ Video RAM		Management controller embedded on motherboard/ 32MB					
	Graphic display/ resolution		640 x 480, 800 x 600, 1,024 x 768, 1,280 x 1,024: 16,770,000 colors max.					

Item		Express5800/R120b-1					
		Diskless model					
		N8100-1654F	N8100-1655F	N8100-1656F	N8100-1657F	N8100-1658F	N8100-1659F
Interface	Keyboard/mouse	1 port (PS/2, 1 for rear panel)/1 port (PS/2, 1 for rear panel)					
	Analog RGB	2 ports (MINI D-Sub 15-pin, 1 for front panel, 1 for rear panel)					
	Serial	1 port (RS-232C compliant/D-Sub 9-pin, serial port B, 1 for rear panel, optional port can be used (up to two ports in total)					
	USB 2.0	8 ports (2 for front panel, 2 for rear panel, 4 for internal)					
	1000BASE-T LAN connector	2 ports (100Base-TX/10Base-T supported, RJ-45, 2 for rear panel)					
	LAN connector for management	1 port (100Base-TX/10Base-T supported, RJ-45, 1 for rear panel)					
Backup power supply		Supported (option, hot-plug available)					
Backup fan		Supported (standard, hot-plug available)					
External dimensions (mm)	Excluding front bezel, inner rail, and protruding parts	427.5 (width) x 722 (depth) x 43.5 (height)					
	Including front bezel, inner rail, and protruding parts	486.5 (width) x 821.9 (depth) x 43.9 (height)					
Weight (Max.)		16kg (21kg) (including rail)					
Power supply		650W 80 PLUS® Gold compliant (hot-plug available) 100 to 120VAC ± 10%, 200 to 240VAC ± 10%, 50/60Hz ± 3Hz					
Environmental requirements	Temperature	10 to 35ºC (operating), -10 to 55ºC (non-operating, storage)					
	Humidity	20 to 80% RH (no condensation)[*6]					

*1   In a 2-CPU configuration. Max. 96GB (16GB x 6) in a 1-CPU configuration.
*2   When using the memory RAS feature, you need to install a dedicated RAS memory board (N8102-387/388/389/390/391).
   Note that the memory boards N8102-371(F)/372(F)/373(F)/374(F)/375(F)/428(F)/429(F) cannot be used.
*3   The hard disk drive capacity is indicated based on the conversion value of 1GB = 1000^3 bytes. If you are calculating the hard disk drive capacity based on a conversion value of 1GB = 1024^3 bytes, the actual usable hard disk drive capacity will be insufficient.
*4   Writing software is not supplied with the server.
*5   For maintenance purposes or for re-installing operating system, prepare at least one external DVD-ROM and one external FDD or Flash FDD per system.
*6   If the server is stored in an environment where the temperature is either too low or too high, the system clock might become inaccurate.
   If you require an accurate system clock, we recommend using a time server (NTP server).

Item			NEC Express5800/R120b-1						
			Diskless model						
			N8100-1717F	N8100-1718F	N8100-1719F	N8100-1720F	N8100-1721F	N8100-1722F	N8100-1723F
CPU	Type		Intel® Xeon® Processor E5606	Intel® Xeon® Processor E5620	Intel® Xeon® Processor E5645	Intel® Xeon® Processor L5640	Intel® Xeon® Processor X5650	Intel® Xeon® Processor X5675	Intel® Xeon® Processor X5690
	Clock		2.13GHz	2.40GHz		2.26GHz	2.66GHz	3.06GHz	3.46GHz
	Standard		1						
	Maximum		2						
	3rd cache		8MB	12MB					
	Number of cores / number of threads		4/4	4/8	6/12				
Chipset			Intel® 5520						
Memory	Standard		–						
	Maximum		Registered DIMM: 192GB (16GB x12) [1]						
	Memory module		DDR3L-1333 Registered DIMM (1/2/4/8GB), DDR3L-1066 Registered DIMM (16GB)						
	Maximum clock		1066MHz		1333MHz				
	ECC check, correction		ECC, x4 SDDC, LockStep mode (x8 SDDC)						
	Online spare memory		Supported						
	Memory mirroring / Memory RAID [2]		Supported						
Auxiliary storage	Drive bay	Standard	–						
		Maximum [3]	HDD: SATA 6TB (1TB x6), SAS 5.4TB (900GB x6), SSD: SATA 600GB (100GB x6)						
		Hot-plug	Supported						
	Interface level / RAID system		SATA 3Gb/s: RAID 0/1/10 (standard [3]), RAID 5/6/50 (option) SAS 6Gb/s: RAID 0/1/5/6/10/50 (option)						
	Optical disk drive		Built in / external drive (option) [4,5]						
	FDD		External drive (option) [5]						
	Device bay		–						
Additional slots	Supported slot		1x PCI EXPRESS 2.0 (x16 lanes, x16 sockets) (Full-height, 175 mm) 1x PCI EXPRESS 2.0 (x8 lanes, x8 sockets) (low-profile, 167.6 mm) 1x PCI EXPRESS 2.0 (x4 lanes, x8 sockets) (dedicated RAID slot)						
Graphics	Graphics accelerator / Video RAM		Management controller embedded on motherboard / 32MB						
	Graphic display / resolution		640x480, 800x600, 1,024x768, 1,280x1,024: 16,770,000 colors max						
Interface	Keyboard / mouse		1 port (PS/2, 1 for rear panel) / 1 port (PS/2 for rear panel)						
	Analog RGB		2 ports (MINI D-sub 15-pin, 1 for front panel, 1 for rear panel)						
	Serial		1 port (RS-232C compliant / D-Sub 9-pin, serial port B, 1 for rear panel, optional port cab be used (up to two ports in total)						
	USB 2.0		8 ports (2 for front panel, 2 for rear panel, 4 for internal)						
	1000BASE-T LAN connector		2 ports (100BASE-TX / 10BASE-T supported, RJ-45, 2 for rear panel)						
	LAN connector for management		1 port (100BASE-TX/10BASE-T supported, RJ-45, 1 for rear panel)						
Backup power supply			Supported (option, hot-plug available)						

Item		NEC Express5800/R120b-1						
		Diskless model						
		N8100-1717F	N8100-1718F	N8100-1719F	N8100-1720F	N8100-1721F	N8100-1722F	N8100-1723F
Redundant fan		Supported (standard, hot-plug available)						
External dimensions (mm)	Excluding front bezel, inner rail, and protruding parts	427.5 (width) x 722 (depth) x 43.5 (height)						
	Including front bezel, inner rail, and protruding parts	486.5 (width) x 821.9 (depth) x 43.9 (height)						
Weight (Max.)		16 kg (21 kg) (including rail)						
Power supply		650W 80 PLUS Gold® hot-plug available) 100 to 120VAC ±10%, 200 to 240VAC ±10%, 50/60Hz ±3Hz						
Environmental requirements	Temperature	10 to 35°C (operating), –10 to 55°C (non-operating, storage)						
	Humidity	20 to 80% RH (no condensation) [6]						

*1   In a 2-CPU configuration. Max. 96GB (16GB x 6) in a 1-CPU configuration.
*2   When using the memory RAS feature, you need to install a dedicated RAS memory board
      (N8102-387/388/389/390/391).
      Note that the memory boards N8102-371(F)/372(F)/373(F)/374(F)/375(F)/428(F)/429(F) cannot be used.
*3   The hard disk drive capacity is indicated based on the conversion value of 1GB = 1000^3 bytes. If you are
      calculating the hard disk drive capacity based on a conversion value of 1GB = 1024^3 bytes, the actual
      usable hard disk drive capacity will be insufficient.
*4   Writing software is not supplied with the server.
*5   For maintenance purposes or for re-installing operating system, prepare at least one external DVD-ROM
      and one external FDD or Flash FDD per system.
*6   If the server is stored in an environment where the temperature is either too low or too high, the system
      clock might become inaccurate.
      If you require an accurate system clock, we recommend using a time server (NTP server).

3.5-inch disk model

Item			Express5800/R120b-1 Diskless model			
			N8100-1660F	N8100-1661F	N8100-1662F	N8100-1663F
CPU	Type		Intel® Xeon® Processor E5503	Intel® Xeon® Processor E5506	Intel® Xeon® Processor E5620	Intel® Xeon® Processor X5640
	Clock		2GHz	2.13GHz	2.40GHz	2.66GHz
	Standard		1			
	Maximum		2			
	3rd cache		4MB		12MB	
	No. of cores/No. of threads		2/2	4/4	4/8	
Chipset			Intel® 5520			
Memory	Standard		–			
	Maximum		Registered DIMM 192GB (16GB x 12) [*1]			
	Memory module		DDR3L-1333 Registered DIMM (1/2/4/8GB), DDR3L-1066 Registered DIMM (16GB)			
	Maximum clock		800MHz		1066MHz	
	Error check, correction		ECC, x4/LockStep mode (x8) SDDC			
	Online spare memory		–		Supported	
	Memory mirroring/ memory RAID[*2]		Supported			
Auxiliary storage	Drive bay	Standard	–			
		Maximum[*3]	SATA 6TB (2TB x 3)			
		Hot-plug	Supported			
	Interface level/ RAID system		SATA 3Gb/s: RAID 0/1 (standard[*3]), RAID 5/6 (option)			
	Optical disk drive		Built in/external drive (option)[*4, 5]			
	FDD		External drive (option)[*5]			
	Device bay		–			
Additional slots	Supported slot		1 x PCI Express 2.0 (x 16 lanes, x 16 sockets) (Full-height, 175mm) 1 x PCI Express 2.0 (x 8 lanes, x 8 sockets) (Low-profile, 167.6mm) 1 x PCI EXPRESS 2.0 (x4 lanes, x8 sockets) (dedicated RAID slot)			
Graphics	Graphics accelerator/ Video RAM		Management controller embedded on motherboard/ 32MB			
	Graphic display/ resolution		640 x 480, 800 x 600, 1,024 x 768, 1,280 x 1,024: 16,770,000 colors max.			
Interface	Keyboard/mouse		1 port (PS/2, 1 for rear panel)/1 port (PS/2, 1 for rear panel)			
	Analog RGB		2 ports (MINI D-Sub 15-pin, 1 for front panel, 1 for rear panel)			
	Serial		1 port (RS-232C compliant/D-Sub 9-pin, serial port B, 1 for rear panel, optional port can be used (up to two ports total)			
	USB 2.0		8 ports (2 for front panel, 2 for rear panel, 4 for internal)			
	1000BASE-T LAN connector		2 ports (100Base-TX/10Base-T supported, RJ-45, 2 for rear panel)			
	LAN connrctor for management		1 port (100Base-TX/10Base-T supported, RJ-45, 1 for rear panel)			
Backup power supply			Supported (option, hot-plug available)			
Backup fan			Supported (option, hot-plug available)			
External dimensions (mm)	Excluding front bezel, inner rail, and protruding parts		427.5 (width) x 722 (depth) x 43.5 (height)			
	Including front bezel, inner rail, and protruding parts		486.5 (width) x 821.9 (depth) x 43.9 (height)			

Item		Express5800/R120b-1			
		Diskless model			
		N8100-1660F	N8100-1661F	N8100-1662F	N8100-1663F
Weight (Max.)		16kg (21kg) (including rail)			
Power supply		650W 80 PLUS® Gold compliant (hot-plug)			
		100 to 120VAC ± 10%, 200 to 240VAC ± 10%, 50/60Hz ± 3Hz			
Environmental requirements	Temperature	10 to 35ºC (operating), -10 to 55ºC (non-operating, storage)			
	Humidity	20 to 80% RH (no condensation)[6]			

*1   In a 2-CPU configuration. Max. 96GB (16GB x 6) in a 1-CPU configuration.
*2   When using the memory RAS feature, you need to install a dedicated RAS memory board
       (N8102-387/388/389/390/391). Note that the memory boards N8102-371/372/373/374/375 cannot be used.
*3   The hard disk drive capacity is indicated based on the conversion value of 1GB = 1000^3 bytes. If you are
       calculating the hard disk drive capacity based on a conversion value of 1GB = 1024^3 bytes, the actual usable
       hard disk drive capacity will be insufficient.
*4   Writing software is not supplied with the server.
*5   For maintenance purpose or for re-installation of operating system, prepare at least one set of the external
       DVD-ROM and external FDD or Flash FDD per system.
*6   If the server is stored in an environment where the temperature is either too low or too high, the system clock
       might become inaccurate.
       If you require an accurate system clock, we recommend using a time server (NTP server).

Item			NEC Express5800/R120b-1		
			Diskless model		
			N8100-1724F	N8100-1725F	N8100-1726F
CPU	Type		Intel® Xeon® Processor E5606	Intel® Xeon® Processor E5620	Intel® Xeon® Processor X5650
	Clock		2.13GHz	2.40GHz	2.66GHz
	Standard		1		
	Maximum		2		
	3rd cache		8MB	12MB	
	Number of cores / number of threads		4/4	4/8	6/12
Chipset			Intel® 5520		
Memory	Standard		–		
	Maximum		Registered DIMM: 192GB (16GB x12) [*1]		
	Memory module		DDR3L-1333 Registered DIMM (1/2/4/8GB), DDR3L-1066 Registered DIMM (16GB)		
	Maximum clock		1066MHz		1333MHz
	ECC check, correction		ECC, x4 SDDC, LockStep mode (x8 SDDC)		
	Online spare memory		Supported		
	Memory mirroring / Memory RAID [*2]		Supported		
Auxiliary storage	Drive bay	Standard	—		
		Maximum [*3]	HDD: SATA 6TB (2TB x6)		
		Hot-plug	Supported		
	Interface level / RAID system		SATA 3Gb/s: RAID 0/1 (standard [*3]), RAID 5/6 (option)		
	Optical disk drive		Built in / external drive (option) [*4,5]		
	FDD		Built in / external drive (option) [*5]		
	Device bay		–		
Additional slots	Supported slot		1x PCI EXPRESS 2.0 (x16 lanes, x16 sockets) (Full-height, 175 mm) 1x PCI EXPRESS 2.0 (x8 lanes, x8 sockets) (low-profile, 167.6 mm) 1x PCI EXPRESS 2.0 (x4 lanes, x8 sockets) (dedicated RAID slot)		
Graphics	Graphics accelerator / Video RAM		Management controller embedded on motherboard / 32MB		
	Graphic display / resolution		640x480, 800x600, 1,024x768, 1,280x1,024: 16,770,000 colors max		
Interface	Keyboard / mouse		1 port (PS/2, 1 for rear panel) / 1 port (PS/2 for rear panel)		
	Analog RGB		2 ports (MINI D-sub 15-pin, 1 for front panel, 1 for rear panel)		
	Serial		1 port (RS-232C compliant / D-Sub 9-pin, serial port B, 1 for rear panel, optional port cab be used (up to two ports in total)		
	USB 2.0		8 ports (2 for front panel, 2 for rear panel, 4 for internal)		
	1000BASE-T LAN connector		2 ports (100BASE-TX / 10BASE-T supported, RJ-45, 2 for rear panel)		
	LAN connector for management		1 port (100BASE-TX/10BASE-T supported, RJ-45, 1 for rear panel)		
Backup power supply			Supported (option, hot-plug available)		
Redundant fan			Supported (standard, hot-plug available)		
External dimensions (mm)	Excluding front bezel, inner rail, and protruding parts		427.5 (width) x 722 (depth) x 43.5 (height)		
	Including front bezel, inner rail, and protruding parts		486.5 (width) x 821.9 (depth) x 43.9 (height)		
Weight (Max.)			16 kg (21 kg) (including rail)		
Power supply			650W 80 PLUS Gold® hot-plug available) 100 to 120VAC ±10%, 200 to 240VAC ±10%, 50/60Hz ±3Hz		
Environmental requirements	Temperature		10 to 35°C (operating), –10 to 55°C (non-operating, storage)		
	Humidity		20 to 80% RH (no condensation) [*6]		

*1   In a 2-CPU configuration. Max. 96GB (16GB x 6) in a 1-CPU configuration.
*2   When using the memory RAS feature, you need to install a dedicated RAS memory board
     (N8102-387/388/389/390/391).
     Note that the memory boards N8102-371(F)/372(F)/373(F)/374(F)/375(F)/428(F)/429(F) cannot be used.
*3   The hard disk drive capacity is indicated based on the conversion value of $1GB = 1000^3$ bytes. If you are
     calculating the hard disk drive capacity based on a conversion value of $1GB = 1024^3$ bytes, the actual usable
     hard disk drive capacity will be insufficient.
*4   Writing software is not supplied with the server.
*5   For maintenance purposes or for re-installing operating system, prepare at least one external DVD-ROM and
     one external FDD or Flash FDD per system.
*6   If the server is stored in an environment where the temperature is either too low or too high, the system clock
     might become inaccurate.
     If you require an accurate system clock, we recommend using a time server (NTP server).

Appendix B

Other Precautions

Transfer Rate of the On-board LAN Controller

The onboard network interface controller supports 10Base-T and 100Base-TX networks and a capable of full or half duplex.

The controller can automatically detect and switch for network speed and transfer mode connected to the HUB. However, for proper network operation, specify the link speed and duplex mode to the same value as the value specified for HUB.

Server Management Software

The NEC EXPRESSBUILDER DVD-ROM that comes with the server contains the NEC ESMPRO utility.

NEC recommends that you should install the NEC ESMPRO for effective use of the reliability enhancement features of the server.
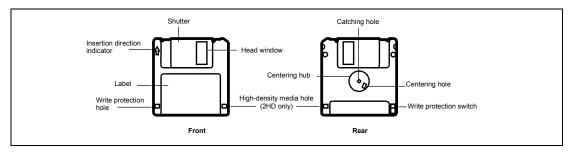
Floppy Disk

The following describes use of the floppy disk.

Floppy disk type

The server uses 3.5-inch floppy disks. You can use the following two types of 3.5-inch floppy disks:

- 2HD floppy disk (double-sided high-density track type)
  Stores data of 1.44MB.
- 2DD floppy disk (double-sided double-density track type)
  Stores data of 720KB.
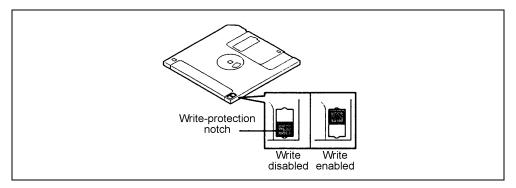
Notes on use

The floppy disk is an important data storage media with delicate structure and requires care. Keep the following notes in mind to use it:

- Insert the floppy disk into the floppy disk drive gently as far as it goes.

- Attach the label to the correct position.

- Do not write anything directly onto the disk surface with a pencil or ball-point pen.

- Do not open the 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 high-temperature place (e.g., place exposed to direct sunlight or close to a heater).

- Do not leave the floppy disk with foods and drinks, or in a place exposed to cigarette smoke.

- Do not leave the floppy disk near any form of liquid or a chemical or in a place where a chemical may be accidentally sprayed over them.

- Do not place any magnetic objects (e.g., magnet) near the floppy disk.

- Do not clip the floppy disk or drop it.

- Keep the floppy disk in a floppy disk case that protects it from magnetism and dust.

- Write-protection

  A floppy disk has a write-protect switch that prevents the stored data from accidental erasure.

You can read data from a write-protected floppy disk, but you cannot save data into the floppy disk or format it. NEC recommends that you should write-protect any floppy disk containing valuable data unless you are about to save data.

To write-protect a 3.5-inch floppy disk, use the write-protect switch provided on its back.

■ Disk format

To write data into a floppy disk, the floppy disk must be "formatted." "Formatting" is to initialize the floppy disk and make it available for the system environment (operating system).

> **IMPORTANT:**
>
> ■ Formatting a used floppy disk clears all the data contained in it, if any.
>
> ■ Formatting a floppy disk from the DOS command line is not available with the server. Use a formatted floppy disk to work with it on the DOS command line.

The format method depends on your operating system. Refer to the manual that comes with your operating system for details.

■ Data backup

"Data backup" is to copy data stored in a media into another media (e.g., floppy disk, digital audio tape, or magnet-optical disk).

> **IMPORTANT:** Make sure to make a back-up copy of every floppy disk, if provided.

The floppy disk is a very delicate storage media. Dust or thermal changes, as well as operator's misconduct or sever failures, may cause loss of data. To avoid loss of data, NEC recommends that you should make a back-up copy of your valuable data on a regular basis.

DVD/CD-ROM

Keep the following notes in mind to use the DVD/CD-ROM for the server:

- Press the center of the storage case to remove the DVD/CD-ROM from the case.
- Do not drop the DVD/CD-ROM.
- Do not place anything on the DVD/CD-ROM or bend the DVD/CD-ROM.
- Do not attach any label onto the DVD/CD-ROM.
- Do not touch the signal side (nothing is printed on this side) with your hand.
- Place the DVD/CD-ROM with its printed side upward and gently put it on the tray.
- Do not scratch the DVD/CD-ROM or write anything directly on it with a pencil or ball-point pen.
- Do not leave the DVD/CD-ROM with foods and drinks, or in a place exposed to cigarette smoke.
- Do not leave the DVD/CD-ROM in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).
- When dust or fingerprints are attached on the DVD/CD-ROM, wipe the DVD/CD-ROM from its center to edge with a dry soft cloth slowly and gently.
- Use the dedicated cleaner to clean the DVD/CD-ROM. Do not use record spray/cleaner, benzene, or thinner.
- Keep the DVD/CD-ROM in the dedicated case when not in use.

Tape Media

The following describes data handling with the DAT, DLT, or AIT optionally available for the server.

- Saving your valuable data

  When you save your valuable data or programs into the cartridge tape, you should save them into two cartridge tapes to make the primary and secondary tapes.

  This enables you to restore your data from one tape when the other makes a read error, as well as to protect your valuable data and programs from loss.

- Three-generation data management

  NEC recommends that you should employ three-generation data management for data storage.

  Three-generation data management uses three cartridge tapes: A, B, and C. You save data to tape A on the first day, tape B on the second day, tape C on the third day, tape A on the forth day, and so on. That is, you save data into cartridge tapes cyclically from tape A through C.
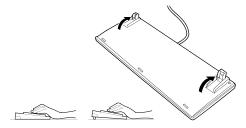
This enables you, for example, to use tape B to restore the data when tape C makes a read error. Also when both tapes B and C make a read error, you can restore your valuable data by using the data stored in tape A.

Keyboard

The keyboard is a device to instruct you computer by entering alphanumeric characters or symbols.

IMPORTANT:

■ Do not pour any liquid such as water or put anything into the keyboard. Doing so may cause a failure of the keyboard.

■ The keyboard provided with the server is designed for adjustment of an angle. Adjust the keyboard angle at which the keyboard is easy to operate. The adjustment assists in reducing strain on your shoulders, arms, and fingers.

NOTE: The keyboard functions depend on the software. Refer to the manual that comes with the software for details.

Mouse

Like the keyboard, the mouse is a device to instruct your computer. Many OS's and application software require the mouse for operation.

NOTE:

- Functions assigned to the mouse buttons vary depending on the software. For details, refer to the manual provided with the software.

- Use the mouse on a clean desk. Using the mouse on a dusty or dirty desk disturbs smooth movement or normal operation of the mouse. When your mouse movement seems dull, clean your mouse. (See Chapter 7.)
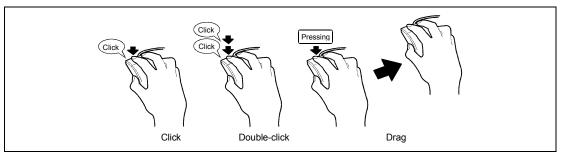
Mouse operation includes "Click," "Double-click," and "Drag."

Click: Press the button only once and release it.

Double-click: Press the button twice consecutively and release it.

Drag: Press and hold the button and move the mouse.

Operation of the server involves combinations of these mouse operations and data entries with the keyboard.

Appendix C

IRQ

The factory-set interrupt requests are listed below. Find an appropriate one to install an optional device.

Interrupt Request

The factory-set IRQs are assigned as follows:

IRQ	Peripheral Device (Controller)	IRQ	Peripheral Device (Controller)
0	System timer	12	SM Bus
1	–	13	Numeric data processor
2	–	14	–
3	COM 2 serial port	15	–
4	COM 1 serial port	16	VGA, LAN1
5	PCI	17	LAN2, SATA
6	–	18	–
7	PCI	19	–
8	Real-time clock	20	USB
9	ACPI Compliant System	21	USB
10	PCI	22	USB
11	Motherboard resource	23	USB

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Appendix D

Installing Windows Server 2008 R2

This section explains how to install the Windows Server 2008 R2.

NOTICE

Read the following notes or information before installing the Windows Server 2008 R2.

Optional Board Supported by NEC EXPRESSBUILDER

The NEC EXPRESSBUILDER DVD-ROM attached to your server supports the following optional boards:

> **NOTE:** If you want to install the other boards by using a driver floppy disk ("OEM-Disk for Mass storage device"), except ones listed below, see "Installing with the OEM-Disk for Mass storage device".

- Controllers supporting installation of OS with Express Setup

  - N8103-129 RAID Controller (256 MB, RAID 0/1)*
  - N8103-130 RAID Controller (256 MB, RAID 0/1/5/6)*
  - Onboard RAID Controller (LSI Embedded MegaRAID™)

- Other controllers

  - N8103-75 SCSI Controller*
  - N8103-104A SAS Controller*
  - N8103-107 SCSI Controller*
  - N8190-127 Fibre Channel Controller*
  - N8190-131 Fibre Channel Controller (2ch)*
  - N8190-153 Fibre Channel Controller (1ch)*
  - N8190-154 Fibre Channel Controller (2ch)*
  - * Option

Service Pack Which EXPRESSBUILDER Supports

The NEC EXPRESSBUILDER DVD-ROM attached to the server supports following combination of the OS installation media and Service Pack.

- ■ Windows Server 2008 R2
    - – OS installation media (No Service Pack)

Installing Service Pack

You can install the Service Pack on the server. When the Service Pack is not attached to your system, prepare it by yourself.

Updating System

If you modified the Windows system, execute "Update the system" in the Autorun Menu.

Installing on the Mirrored Volume

When re-installing the OS to a hard disk drive which has been upgraded to Dynamic Disk, only the simple dynamic volume is available for installation.

If you want to install the OS on a volume that is mirrored using [Disk Management], invalidate the mirroring and reset to the basic disk before the installation, and validate the mirroring again after the installation.

You can create, invalidate, or delete the mirror volume by using [Disk Management] in [Computer Management].

Mounting MO Device

Do not mount an MO device on your server during the Windows installation.

About Removable Media

Do not set removable media, such as DAT and LTO, into the device mounted on this computer during the Windows installation.

Floppy Disk Drive

The internal floppy disk drive is not included in your system at the standard configuration. Prepare the optional Flash FDD or USB FDD if necessary.

About the System Partition Size

The system partition size can be calculated from the following formula.

When the system is Windows Server 2008 R2:

Required partition size =
size required to install OS + paging file size + dump file size + application size

Size required to install OS	= 8,000MB (Full Installation)
	or
	= 3,500MB (Server Core Installation)
Paging file size (recommended)	= Installed memory size * 1.5
Dump file size	= Installed memory size + 300MB
Application size	= Required size

IMPORTANT:

- The above-mentioned partition size is the minimum partition size required for system installation. Ensure sufficient partition size for system operation.

  Following numbers are the recommended size.

  – Full Installation: 32,768MB (32GB) or more

  – Server Core Installation: 10,240MB (10GB) or more

    *1GB = 1,024MB

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the Windows Partition is required.
  Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.

- Regardless of the size of the mounted memory, or the Write debugging information (type of memory dump), the maximum size of the dump file is 'The size of the mounted memory + 300MB'.

- If you install any application program or the like, add necessary space to the partition to install these programs.

> **NOTE:** When new partition is created, initial 100MB is assigned as boot partition by Windows OS.
>
> Example:
>
> If you make a partition of 40,960MB (40GB), usable space will be 40,960MB – 100MB = 40,860MB.

The partition size required for a system with an installed memory size of 1GB(1,024MB) and a full installation of the operating system:

8,000MB + (1,024MB * 1.5) + (1,024MB + 300MB) + application size
= 10,860MB + application size.

If the provided partition size is smaller than that required to install the OS and paging file, expand the partition size or utilize a larger disk. If your system does not have a sufficient dump file size, divide the required file space into multiple disks by performing the steps below:

1. Set the system partition size to a size sufficient to install the OS and paging file.

2. See "Setting for Solving Problems" to write the debug information of the dump file onto another disk.

If there is not enough disk space to write the debug information, add another disk for the dump file.

BitLocker

If you use BitLocker, note the following:

■ Be sure to keep the recovery password secure. Do not keep it around a server running BitLocker.

> **IMPORTANT:** Without the recovery password, you cannot start the operating system and see the partition content encrypted by BitLocker. The recovery password may be needed when you start the operating system after performing the following tasks:
> – Replacing the motherboard
> – Initializing the TPM
> – Changing the BIOS setting

■ Windows Server 2008 R2 is not installed in the partition encrypted by BitLocker.

■ For BitLocker, hotfix is provided by Microsoft. Before applying hotfix, check the information written by Microsoft carefully. For more information, visit http://support.microsoft.com/kb/975496/en-us.

INSTALLING Windows Server 2008 R2

Preparations for Installation

- NEC EXPRESSBUILDER DVD-ROM

- Microsoft Windows Server 2008 R2 Standard (DVD-ROM) / Microsoft Windows Server 2008 R2 Enterprise (DVD-ROM)

- User's Guide

- Getting Started

Windows Server 2008 R2 Clean Installation

This section explains how to perform a clean installation of Windows Server 2008 R2.

Follow steps below appropriate to your environment.

1. Turn on your system.

   > **IMPORTANT:** To install Windows Server 2008 R2, you may need to update BIOS.
   >
   > To check if your system needs a BIOS update, go to:
   >
   > http://www.nec.com/express/

2. Insert the Windows Server 2008 R2 DVD-ROM into your DVD-ROM drive.

3. Restart the system.

   To restart the system, press **Ctrl** + **Alt** + **Del** or turn off the system once, and then turn it on again.

   > **IMPORTANT:** When prompted to [press any key to boot from CD or DVD], press **Enter** while the message is displayed.
   >
   > If the Windows installation screen (shown in step 4) does not appear, turn off the system, and then turn it on again.

   The DVD-ROM starts. A message "Windows is loading files …" appears.

4. Select a language and other options from the drop-down lists, and then click [Next].

5. Click the [Install now ➡] button.

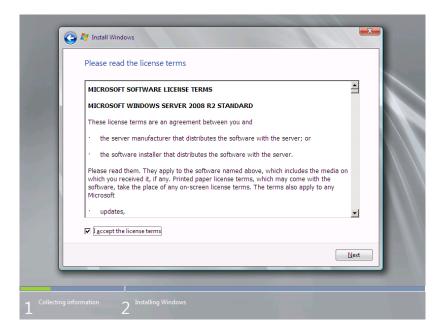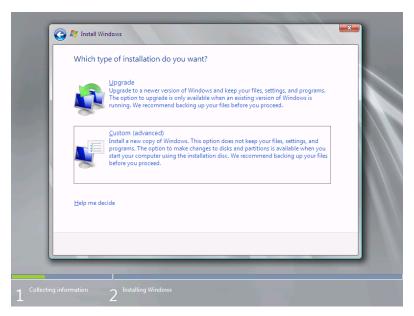The installation starts.

6. Select the edition of the Windows operating system that you purchased.

> **NOTE:** The Windows versions listed on the screen vary depending on the Windows Server 2008 R2 DVD-ROM you are using.

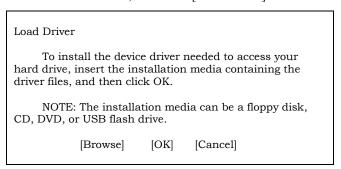**7.** Read the license terms carefully. If you agree, select [I accept the license terms], and then click [Next].

8.   Select the type of installation you want.

[Custom (advanced)] is selected below.

9.   The screen of "Where do you want to install Windows?" is displayed.

> **NOTE:** Please go to step 12 when you do not use the RAID Controller.

Remove the Backup DVD-ROM or Windows Server 2008 R2 DVD-ROM and set NEC EXPRESSBUILDER DVD, and select [Load Driver].

Load Driver

　　　To install the device driver needed to access your hard drive, insert the installation media containing the driver files, and then click OK.

　　　NOTE: The installation media can be a floppy disk, CD, DVD, or USB flash drive.

[Browse]   [OK]   [Cancel]

Click [Browse], and go to Step 10.

10. The folder reference dialog box appears.
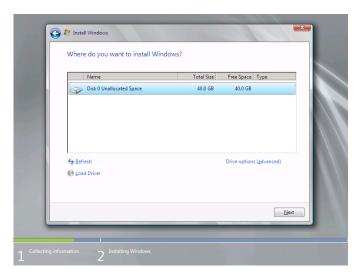
Select a path in the NEC EXPRESSBUILDER DVD, and then click [OK].

– If the Onboard RAID Controller (LSI Embedded MegaRAID^{TM}) is used:

  <drive letter>:\017\win\winnt\oemfd\ws2008r2\fd1\megasr1

– If the N8103-129/130 RAID Controller is used:

  <drive letter>:\017\win\winnt\oemfd\ws2008r2\fd1\megasas2

After you select the path, a list of drivers is displayed.

Select the following driver, and then click [OK]. Go to Step 11.

– If the Onboard RAID Controller (LSI Embedded MegaRAID^{TM}) is used:

  [LSI Embedded MegaRAID]

– If the N8103-129/130 RAID Controller is used:

  [LSI MegaRAID SAS 9264-8i]

11. Remove the NEC EXPRESSBUILDER DVD and set Backup DVD-ROM or Windows Server 2008 R2 DVD-ROM.

12. Select the disk where a partition will be created, and then click [Drive options (advanced)].

IMPORTANT: If the partition has already been created, go to step 15.

NOTE: The following message might be displayed when not replacing it with OS installation media after driver's reading. Please replace with OS installation media when it is displayed, and click "refresh".
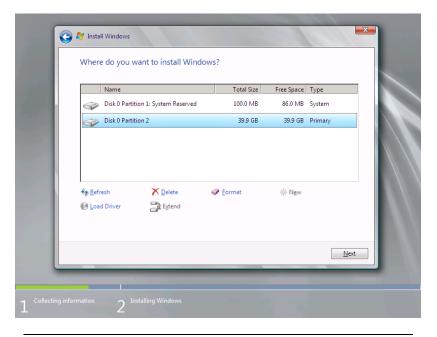
⚠ Windows cannot be installed to this disk. (Show details)

13.   Click [New], enter a partition size, and then click [Apply].

> **NOTE:** When new partition is created, initial 100MB is assigned as boot partition by Windows OS.

14.   Select the partition created in step 13, and then click [Format].

15.   Select the partition created, and then click [Next].

> **NOTE:** The number of partitions displayed to a screen by environment of the use is different.

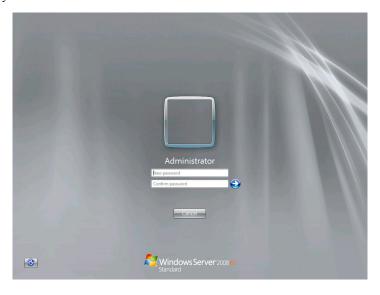When the following message appears, the installation starts automatically.

16. After a full installation of Windows Server 2008 R2 is completed, the following dialog box will prompt you to set or change the password before you log on. Click [OK].

17. Change the password, and then click the [] button.
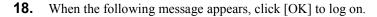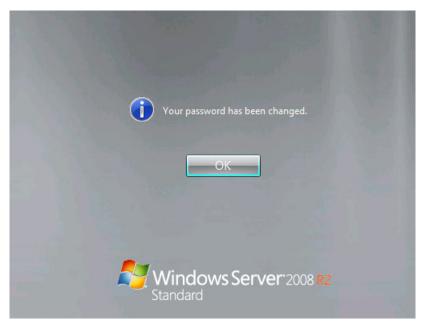
  − If you have selected a full installation

  − If you have selected a Server Core installation

NOTE: Administrator password that satisfy the next condition, are required.

  ■ More than 6 characters

  ■ Contains characters from three of the following categories (numbers, uppercase letters, lowercase letters, and signs)

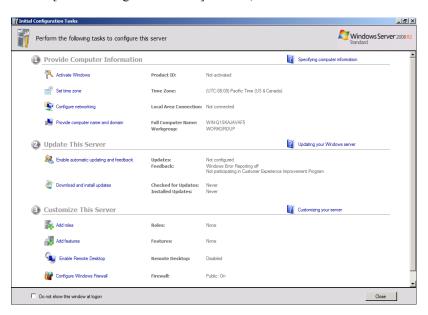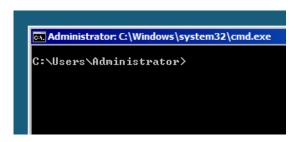**18.** When the following message appears, click [OK] to log on.

19. Log on to the system.

The steps vary depending on the edition you selected in step 6.

– If you have selected a full installation
On the [Initial Configuration Tasks] window, enter user information.

– If you have selected a Server Core installation
  At the command prompt, enter user information.

> **NOTE:** For more detailed procedure, see the "Microsoft Windows
> Server 2008 Step-By-Step Guide".

After installations is completed, be sure to execute the tasks described in "Setup of Device
Driver (Normally Install in Server)" and "Updating the System" of this chapter.

Procedure for License Authentication

Product Key used in the procedure for license authentication should be matched with the COA label in which the product key contained in Windows Server 2008 R2 is written.

> **NOTES:**
> - Execute the activation within 30 days.
> - COA label may be attached to your server.

Updating the System

> **IMPORTANT:** "Updating the System" disables the Scalable Networking Pack (SNP) function.
> The setting of SNP function may affect the system performance.
> Please contact the sales agent for more.

Update the system in the situation below:

- CPU is expanded (expanded to single processor to multi-processor).
- Modified system configuration.
- Recovered the system using recovery process.

The system update brings the correction program provided by Microsoft to be applied to reinforce the system security.

The system update is recommended.

Application Process of "Updating the System"

"Updating the System" applies the drivers necessary for NEC Express5800 Series.

1. Log on to the system using an administrator account.

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

3. Hereinafter, the setup process is depending on the content selected at [Installing Windows Server 2008 R2], follow each of the instructions.

– If you have selected a full installation
If the menu is displayed, click [Setup Windows] and click [Update the system].

> **NOTE:** Right-clicking on the Menu produces the same outcome.

– If you have selected a Server Core installation
1) Execute the following command line from command prompt to specify the optical disk drive (e.g. D drive).
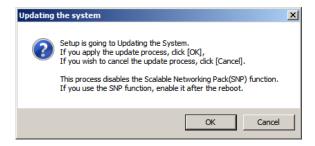
cd /d d:\017\win\winnt\bin\oschk

```
C:\Users\administrator>cd /d D:\017\win\winnt\bin\oschk
```

2) Type following command line and press **Enter**.

oschk.bat

```
D:\017\win\winnt\bin\oschk>oschk.bat
```
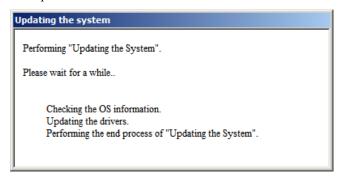
4. The following box appears.

5.   Read the message, and then click [OK].

The update starts.

> **NOTE:** The following box appears during the update if you have deployed a full installation of Windows Server 2008 R2. Wait until the update completes.
>
> **Updating the system**
>
> Performing "Updating the System".
>
> Please wait for a while..
>
>   Checking the OS information.
>   Updating the drivers.
>   Performing the end process of "Updating the System".

6.   When the following message appears, click [OK] to restart the system.

> **Updating the system**   ✕
>
> (i)   "Updating the System" was finished.
>   The setup reboots for installing the drivers.
>
>   OK

The system has been updated.

DRIVER INSTALLATION AND ADVANCED SETTINGS

This section describes on how to install and setup various standard drivers mounted on the device.

For the information on installing and setting up the driver that is not described in this section, refer to the document attached to the driver.

LAN Driver and PROSet

Please refer to Chapter 5 "Installing and Setting Device Drivers" for Windows Server 2008 R2 to install and setup LAN driver and PROSet.

Graphics Accelerator Driver

If you use standard graphics accelerator drivers, update your system with NEC EXPRESSBUILDER DVD-ROM attached to your system.
Standard graphics accelerator drivers will be installed automatically.

> **NOTE:** <Windows Server 2008>
>
> The graphics accelerator driver is supported only on a server running a full installation. Use VGA on a server running a Server Core installation.

Observe the following procedure when you want to reinstall the driver individually.

1. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive.

If the autorun menu is displayed, close menu screen.

2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].

3. Run "setup.exe" in the following directory.

\017\win\winnt\ws2008x64\video

4. Follow the message to continue the installation.

If the dialog message "Digital Signature could not been found." appears, select [Yes] to continue.

5. Remove the NEC EXPRESSBUILDER DVD-ROM from the optical disk drive, restart the system.

Installing SCSI Controller Driver (N8103-75/107)

If you use the SCSI Controller N8103-75/107, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing SAS Controller Driver (N8103-104A)

If you use the SAS Controller N8103-104A, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing Fibre Channel Controller Driver (N8190-127/131/153/154)

If you use the Fibre Channel Controller N8190-127/131/153/154, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.
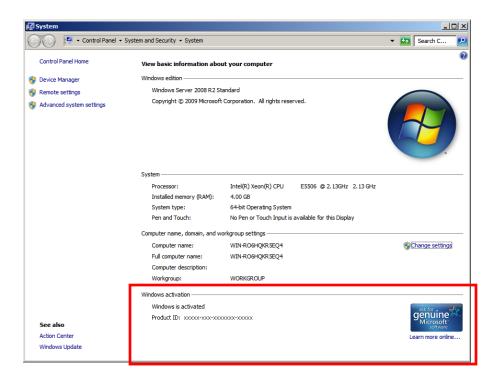
About Windows Activation

Windows Server 2008 R2 must be activated before you can use Windows Server 2008 R2.
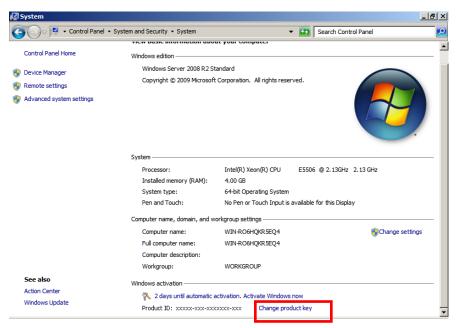
Windows activation process is as follows.

For a server running a full installation

1. Select [Control Panel] and click [System and Security], then select [System].
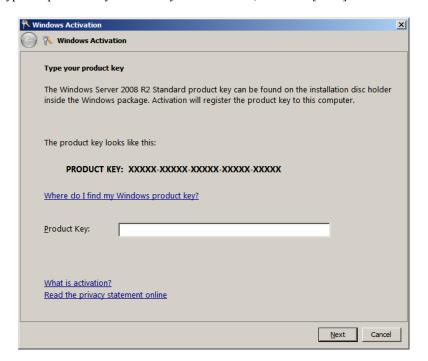
> **IMPORTANT:** If the following message appears, Windows has already been activated on your system.
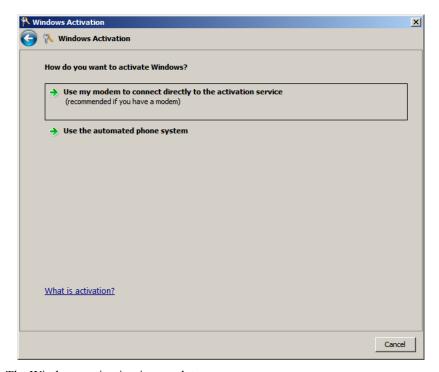
2. In the following screen, click [Change product key].

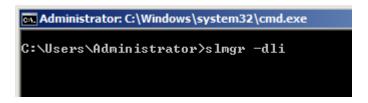**3.** Type the product key shown on your COA label, and click [Next].

4. Activate Windows.

The Windows activation is complete.

For a server running a Server Core installation
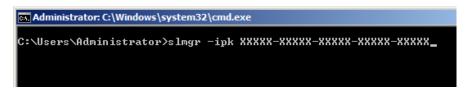
   1.   At the command prompt, type **slmgr –dli**, and press **Enter**.
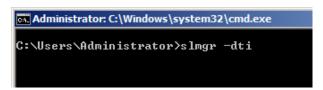
   IMPORTANT: If the following message appears, Windows has already been activated on your system. Click **X** to exit.

   2.   Type **slmgr –ipk <PID>**, and press **Enter**.

   * PID is your product key on the COA label.

   3.   Type **slmgr –dti** to obtain an installation ID for Windows activation, and press **Enter**.

   4.   See "%systemroot%\system32\sppui\phone.inf" for the phone number of the Microsoft customer service.

5. Call the above number, inform the representative of the installation ID which you obtained in step 3, and receive a confirmation ID.

6. At the command prompt, type **slmgr –atp <CID>**, and press **Enter**.

* CID is the confirmation ID that you received from the call center.

The Windows activation is complete.

SETTING FOR SOLVING PROBLEMS

Set for collecting memory dump using the procedure described in Chapter 5.

Appendix E

Installing Windows Server 2008

This section explains how to install the Windows Server 2008.

NOTICE

Read the following notes or information before installing the Windows Server 2008.

Optional Board Supported by NEC EXPRESSBUILDER

The NEC EXPRESSBUILDER DVD-ROM attached to your server supports the following optional boards:

> **NOTE:** If you want to install the other boards by using a driver floppy disk ("OEM-Disk for Mass storage device"), except ones listed below, see "Installing with the OEM-Disk for Mass storage device".

■ Controllers supporting installation of OS with Express Setup

   – N8103-129 RAID Controller (256 MB, RAID 0/1)*
   – N8103-130 RAID Controller (256 MB, RAID 0/1/5/6)*
   – Onboard RAID Controller (LSI Embedded MegaRAID™)

■ Other controllers

   – N8103-75 SCSI Controller*
   – N8103-95 SCSI Controller*
   – N8103-104A SAS Controller*
   – N8103-107 SCSI Controller*
   – N8190-127 Fibre Channel Controller*
   – N8190-131 Fibre Channel Controller (2ch)*
   – N8190-153 Fibre Channel Controller (1ch)*
   – N8190-154 Fibre Channel Controller (2ch)*

   * Option

Service Pack Which EXPRESSBUILDER Supports

The NEC EXPRESSBUILDER DVD-ROM attached to the server supports following combination of the OS installation media and Service Pack.

- ■ Windows Server 2008
  - – OS installation media (with Service Pack 2)
  - – OS installation media (No Service Pack) + Service Pack 2
  - – OS installation media (No Service Pack)

Installing Service Pack

You can install the Service Pack on the server. When the Service Pack is not attached to your system, prepare it by yourself.

Updating System

If you modified the Windows system, execute "Update the system" in the Autorun Menu.

Installing on the Mirrored Volume

When re-installing the OS to a hard disk drive which has been upgraded to Dynamic Disk, only the simple dynamic volume is available for installation.

If you want to install the OS on a volume that is mirrored using [Disk Management], invalidate the mirroring and reset to the basic disk before the installation, and validate the mirroring again after the installation.

You can create, invalidate, or delete the mirror volume by using [Disk Management] in [Computer Management].

Mounting MO Device

Do not mount an MO device on your server during the Windows installation.

About Removable Media

Do not set removable media, such as DAT and LTO, into the device mounted on this computer during the Windows installation.

Floppy Disk Drive

The internal floppy disk drive is not included in your system at the standard configuration. Prepare the optional USB floppy disk drive if necessary.

About the System Partition Size

The system partition size can be calculated from the following formula.

When the system is Windows Server 2008 64-bit (x64) Edition:

Required partition size
= size required to install OS + paging file size + dump file size + application size

Size required to install OS = 11,600MB (Full Installation)
12,300MB (Full Installation with Service Pack 2)
16,720MB (Full Installation + Service Pack 2)

or

= 4,100MB (Server Core Installation)
4,800MB (Server Core Installation with Service Pack 2)
9,220MB (Server Core Installation + Service Pack 2)

Paging file size (recommended) = Installed memory size * 1.5

Dump file size = Installed memory size + 300MB
Application size = Required size

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
  Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.

- Regardless of the size of the mounted memory, or the Write debugging information (type of memory dump), the maximum size of the dump file is 'The size of the mounted memory + 300MB'.

- If you install any application program or the like, add necessary space to the partition to install these programs.

Example:

The partition size required for a system with an installed memory size of 1GB (1,024MB) and a full installation of the operating system:

> 11,600MB + (1,024MB * 1.5) + (1,024MB + 300MB) + application size
> = 14,460MB + application size.

If the provided partition size is smaller than that required to install the OS and paging file, expand the partition size or utilize a larger disk. If your system does not have a sufficient dump file size, divide the required file space into multiple disks by performing the steps below:

1. Set the system partition size to a size sufficient to install the OS and paging file.

2. See "Setting for Solving Problems" to write the debug information of the dump file onto another disk.

If there is not enough disk space to write the debug information, add another disk for the dump file.

When the system is Windows Server 2008 32-bit (x86) Edition

Required partition size
= size required to install OS + paging file size + dump file size + application size

Size required to install OS   = 6,300MB (Full Installation)
                                   9,300MB (Full Installation with Service Pack 2)
                                   9,400MB (Full Installation + Service Pack 2)

                                 or

                                 = 2,200MB (Server Core Installation)
                                   5,200MB (Server Core Installation with Service Pack 2)
                                   5,300MB (Server Core Installation + Service Pack 2)

Paging file size (recommended)= Installed memory size * 1.5

Dump file size   = Installed memory size + 300MB

Application size   = Required size

IMPORTANT:

■ The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.

■ Depending on system configuration, 4096MB or more per partition might not be able to be set to the paging file size.
Set it to 4095MB when the message to ask a value that is smaller than 4096MB is displayed.

■ The maximum dump file size for the system with more than 2GB memory mounted is '2048MB + 300MB'.

■ If you install any application program or the like, add necessary space to the partition to install these programs.

Example:

The partition size required for a system with an installed memory size of 1GB (1,024MB) and a full installation of the operating system:

> 6,300MB + (1,024MB * 1.5) + 1,024MB + 300MB + application size
> = 9,160MB + application size.

If the partition where the operating system is installed is smaller than that required to install the OS and paging file, expand the partition size or utilize a larger disk. If your system does not have a sufficient dump file size, divide the required file space into multiple disks by performing the steps below:

1.   Set the partition size to a size sufficient to install the OS and paging file.

2.   See "Setting for Solving Problems" to write the debug information of the dump file onto another disk.

If there is not enough disk space to write the debug information, add another disk for the dump file.

BitLocker

If you use BitLocker, note the following:

- Before you install Windows Server 2008, create two partitions:

  – System partition for a loader
  – Boot partition for the operating system

    > **NOTE:** For more information, see the following documentation in Microsoft TechNet.
    > "Windows BitLocker Drive Encryption Step-by-Step Guide"

- Be sure to keep the recovery password secure. Do not keep it around a server running BitLocker.

    > **IMPORTANT:** Without the recovery password, you cannot start the operating system and see the partition content encrypted by BitLocker.
    >
    > The recovery password may be needed when you start the operating system after performing the following tasks:
    >
    > - Replacing the motherboard
    > - Initializing the TPM
    > - Changing the BIOS setting

- Windows Server 2008 is not installed in the partition encrypted by BitLocker.

INSTALLING Windows Server 2008

Preparations for Installation

- NEC EXPRESSBUILDER DVD-ROM
- Microsoft Windows Server 2008 Standard (DVD-ROM) / Microsoft Windows Server 2008 Enterprise (DVD-ROM)
- User's Guide
- Getting Started
- Windows Server 2008 OEM-Disk for EXPRESSBUILDER

Creating "Windows Server 2008 OEM-Disk for EXPRESSBUILDER"

In case using Onboard RAID Controller (LSI Embedded MegaRAID™), create "Windows Server 2008 OEM-Disk for EXPRESSBUILDER" before installation.

It does not need, except for using Onboard RAID Controller (LSI Embedded MegaRAID™).

> **NOTE:** If you have already "Windows Server 2008 OEM-Disk for EXPRESSBUILDER" for NEC Express5800 server in which you are going to install Windows Server 2008, you do not need to create it again.

> **NOTE:** What is "OEM-Disk"?
> - In case of creating the disk for Windows Server 2008 64-bit (x64) Edition:
>   It is called [Windows Server 2008 x64 OEM-Disk for EXPRESSBUILDER].
> - In case of creating the disk for Windows Server 2008 32-bit (x86) Edition:
>   It is called [Windows Server 2008 OEM-Disk for EXPRESSBUILDER].

You can create Windows Server 2008 OEM-Disk for EXPRESSBUILDER with the following two procedures.

Create from the menu which appears when running NEC Express5800 Server with NEC EXPRESSBUILDER

If you have only NEC Express5800 server to create Windows Server 2008 OEM-Disk for EXPRESSBUILDER, use this procedure.

If Windows Server 2008 can be operated on NEC Express5800 Server, you can use the other procedure described later.

Follow the steps below.

1. Prepare one Flash FDD or one USB floppy disk drive and 3.5-inch floppy disk.

2. Turn on your NEC Express5800 server.

3. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive of the server.

4. Press the RESET switch or press Ctrl, Alt and Delete to reboot the server. (You may also turn off and then on again to reboot the server.)

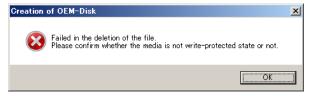   The system will boot from the DVD and NEC EXPRESSBUILDER starts.

5. Select [Create the OEM-Disk for Windows] from [Tools Menu] step.

6. Connect the Flash FDD or the USB floppy disk drive. (If you use the floppy disk drive, insert a floppy disk into it.)

7. Select [Create a Windows Server 2008 OEM-Disk for EXPRESSBUILDER] at [Create OEM-Disk] and click [Perform].

    > **NOTE:** In case of creating the disk for Windows Server 2008 64-bit (x64) Edition, select [Create a Windows Server 2008 x64 OEM-Disk for EXPRESSBUILDER].

8. Windows Server 2008 OEM-Disk for EXPRESSBUILDER will be created.

    Write-protect and attach a label, then keep it safely.

    > **IMPORTANT:** If you have created "OEM-Disk" into the Flash FDD, disconnect it after the NEC EXPRESSBUILDER had been shutdowned.

    > **NOTE:** If the following message is displayed, the floppy disk is write-protected.

    Cancel write-protected state.
    If you have already cancelled write-protected state, connect the floppy disk drive again.

Create from [Autorun Menu]

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

You can create Windows Server 2008 OEM-Disk for EXPRESSBUILDER from [Autorun Menu], if you have the computer on which the above operating systems operate.

Follow the steps below.

1. Prepare one Flash FDD, or one USB floppy disk drive and 3.5-inch floppy disk.

2. Start the Operating System.

3. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive of the server.

   The Menu will appear.

4. Connect the Flash FDD or the USB floppy disk drive. (If you use the floppy disk drive, insert a floppy disk into it.)

5. Click [Create drive disk] and select [OEM-Disk for Windows Server 2008].

> **NOTES:**
>
> ■ In case of creating the disk for Windows Server 2008 64-bit (x64) Edition, select [OEM-Disk for Windows Server 2008 x64].
>
> ■ You can do the same operation with the menu appeared by the Right-click.

6. Windows Server 2008 OEM-Disk for EXPRESSBUILDER will be created.

   Write-protect and attach a label, then keep it safely.

Windows Server 2008 Clean Installation

This section explains how to perform a clean installation of Windows Server 2008.

1. Turn on your system.

> **IMPORTANT:** To install Windows Server 2008, you may need to update BIOS. To check if your system needs a BIOS update, go to: http://www.nec.com/express/.

2. Insert the Windows Server 2008 DVD-ROM into your DVD-ROM drive.

> **NOTE:** When You use "Onboard RAID Controller (LSI Embedded MegaRAID^{TM})", "OEM-Disk" is necessary..

3. Restart the system.
To restart the system, press **Ctrl + Alt + Del** or turn off the system once, and then turn it on again.

> **IMPORTANT:** When prompted to [press any key to boot from CD or DVD], press **Enter** while the message is displayed. If the Windows installation screen (shown in step 4) does not appear, turn off the system, and then turn it on again.

The DVD-ROM starts. A message "Windows is loading files …" appears.

4. Select a language and other options from the drop-down lists, and then click [Next].

5. Click the [Install now] button.

The installation starts.

– If the following message is displayed:
  Go to Step 6.

– If the following message is not displayed:
  Go to Step 9.

> **NOTE:** When the onboard RAID Controller (LSI Embedded MegaRAID^{TM}) is used in environment with built-in DVD drive, the following messages are displayed. Please use "OEM-Disk" made by "Creating Windows Server 2008 OEM-Disk for EXPRESSBUILDER".

Load Driver

    A required CD/DVD drive device driver is missing. If you have a driver for floppy disk, CD, DVD, or USB flash drive, please insert it now.

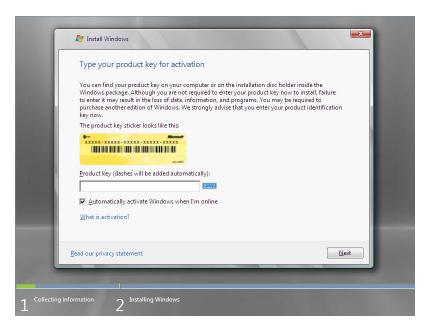   Note; If the Windows installation media is in the CD/DVD drive, you can safely remove it for this step.

        [Browse]   [OK]   [Cancel]

6.   Insert the "OEM-Disk" into the USB floppy disk drive, and press [Browse].
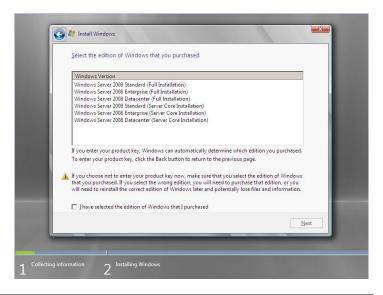
> **IMPORTANT:** If you have created "OEM-Disk" into the Flash FDD, connect the Flash FDD.

> **NOTES:**
>
> - In case of Installing Windows Server 2008 64-bit (x64) Edition: Set the [Windows Server 2008 x64 OEM-Disk for EXPRESSBUILDER].
>
> - In case of Installing Windows Server 2008 32-bit (x86) Edition: Set the [Windows Server 2008 OEM-Disk for EXPRESSBUILDER].

7.   [Browse for Folder] window is displayed:

<Windows Server 2008 64-bit (x64) Edition>

Select < drive letter>:\OEM-Disk\ws2008x64\megasr1, and press [OK].

<Windows Server 2008 32-bit (x86) Edition>

Select < drive letter>:\OEM-Disk\ws2008\megasr1, and press [OK].

8.   Select [LSI Embedded MegaRAID] and press [Next].

9.   Enter your product key, and then click [Next].
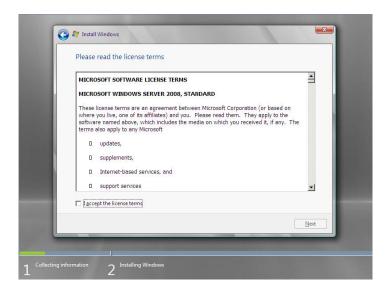
10.   Select the edition of the Windows operating system that you purchased.

Select [I have selected the edition of Windows that I purchased], and then click [Next].

You will see only possible editions that have been determined by Windows based on the key you entered in step 6.
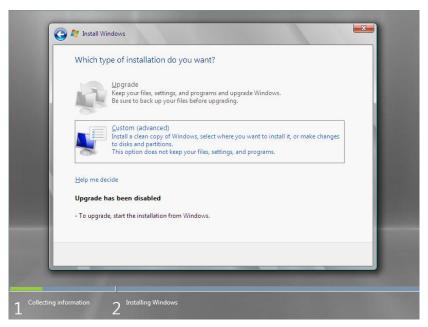
> **NOTE:** The Windows versions listed on the screen vary depending on the Windows Server 2008 DVD-ROM you are using.

11.   Read the license terms carefully. If you agree, select [I accept the license terms], and then click [Next].
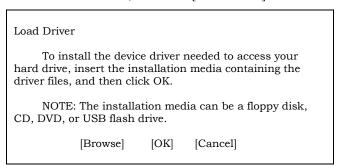
12. Select the type of installation you want.

[Custom (advanced)] is selected below.

13. The screen of "Where do you want to install Windows?" is displayed.

> **NOTE:** Please go to step 16 when you do not use the RAID Controller, and you have load the driver according to step 6-8.

Remove the Backup DVD-ROM or Windows Server 2008 DVD-ROM and set NEC EXPRESSBUILDER DVD, and select [Load Driver].

```
Load Driver

      To install the device driver needed to access your
hard drive, insert the installation media containing the
driver files, and then click OK.

      NOTE: The installation media can be a floppy disk,
CD, DVD, or USB flash drive.

              [Browse]      [OK]      [Cancel]
```

Click [Browse], and go to Step 14.

14. The folder reference dialog box appears.

Select a path in the NEC EXPRESSBUILDER DVD, and then click [OK].

❑ If the N8103-129/130 RAID Controller is used:

– Windows Server 2008 32-bit (x86) Edition
<drive letter>:\017\win\winnt\oemfd\ws2008\fd1\megasas2

– Windows Server 2008 64-bit (x64) Edition
<drive letter>:\017\win\winnt\oemfd\ws2008x64\fd1\megasas2

❑ If Onboard RAID Controller (LSI Embedded MegaRAID™) is used in the environment with which the USB DVD drive is connected:

– Windows Server 2008 32-bit(x86) Edition
<drive letter>:\017\win\winnt\oemfd\ws2008\fd1\megasr1

– Windows Server 2008 64-bit(x64) Edition
<drive letter>:\017\win\winnt\oemfd\ws2008x64\fd1\megasr1

After you select the path, a list of drivers is displayed.

Select the following driver, and then click [OK]. Go to Step 15.

❑ If the N8103-129/130 RAID Controller is used:

[LSI MegaRAID SAS 9264-8i]

❑ If Onboard RAID Controller (LSI Embedded MegaRAID™) is used in the environment with which the USB DVD drive is connected:

[LSI Embedded MegaRAID]
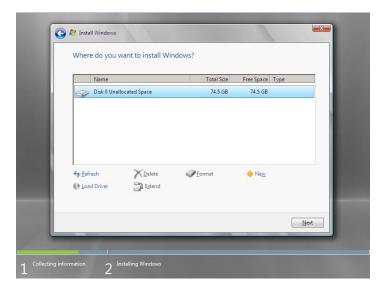
> **NOTE:** When the onboard RAID Controller (LSI Embedded MegaRAID™) is used in environment with built-in DVD drive, the work here is unnecessary.

15. Remove the NEC EXPRESSBUILDER DVD and set Backup DVD-ROM or Windows Server 2008 DVD-ROM.

16. Select the disk where a partition will be created, and then click [Drive Option].

> **IMPORTANT:** If the partition has already been created, go to step 19.

17. Click [New], enter a partition size, and then click [Apply].

18. Select the partition created in step 17, and then click [Format].

19.   Select the partition created, and then click [Next].

When the following message appears, the installation starts automatically.

NOTE: If the disk drive contains NEC EXPRESSBUILDER
DVD-ROM, you will be prompted to replace a media with that for OS
installation. Insert the install media according to the on-screen message.

Install Windows – Insert Disc
Please insert Windows installation disc 1.

OK	Cancel

---

20. Log on to the system. The steps vary depending on the edition you selected in step 7.

If you have selected a full installation

1. After a full installation of Windows Server 2008 is completed, the following dialog box will prompt you to set or change the password before you log on. Click [OK].

2. Change the password, and then click the ⊙ button.
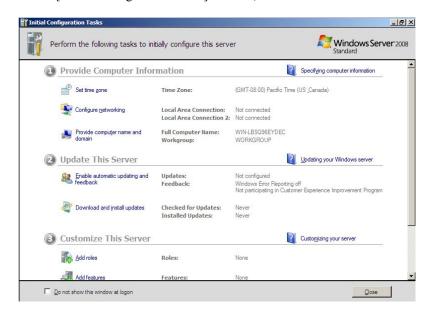
> **NOTE:** Computer name and Administrator password that satisfy the next condition, are required.
>
> ■ More than 6 characters
>
> ■ Contains characters from three of the following categories (numbers, uppercase letters, lowercase letters, and signs).

3. When the following message appears, click [OK] to log on.

4. On the [Initial Configuration Tasks] window, enter user information.

If you have selected a Server Core installation
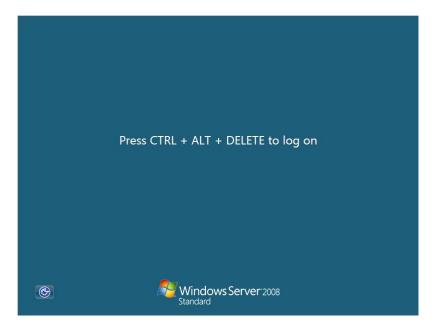
1. After a Server Core installation of Windows Server 2008 is completed, press **Ctrl** + **Alt** + **Del**.

2. Select [Other User].

3. Log on to the system as an administrator.
    You need not enter your password in this dialog box. Click the ⟳ button.

4. Before you log on, you will be prompted to change the password. Click [OK].

5. Change the password, and then click the ⊙ button.

> **NOTE:** Computer name and Administrator password that satisfy the next condition, are required.
>
> ■ More than 6 characters
>
> ■ Contains characters from three of the following categories (numbers, uppercase letters, lowercase letters, and signs).

6. When the following message appears, click [OK].

7. At the command prompt, enter user information.

> **NOTE:** For more detailed procedure, see the "Microsoft Windows Server 2008 Step-By-Step Guide".

After installations is completed, be sure to execute the tasks described in "Setup of Device Driver (Normally Install in Server)" and "Updating the System" of this chapter.

Procedure for License Authentication

Product Key used in the procedure for license authentication should be matched with the COA label in which the product key contained in Windows Server 2008 is written.

NOTES:

- Execute the activation within 60 days.

- COA label may be attached to your server.

Updating the System

IMPORTANT:

- "Updating the System" disables the Scalable Networking Pack (SNP) function.
  The setting of SNP function may affect the system performance.
  Please contact the sales agent for more.

- Refer to the public information of SNP function when KB967224 is not applied.
  Notes are described about KB967224.

Update the system in the situation below:

- CPU is expanded (expanded to single processor to multi-processor).

- Modified system configuration.

- Recovered the system using recovery process.

The system update brings the correction program provided by Microsoft to be applied to reinforce the system security.

The system update is recommended.

Application Process of "Updating the System"

"Updating the System" applies the drivers necessary for NEC Express5800 Series.

1. Log on to the system using an administrator account.

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

3. Hereinafter, the setup process is depending on the content selected at [Installing Windows Server 2008], follow each of the instructions.

– If you have selected a full installation
If the menu is displayed, click [Setup Windows] and click [Update the system].

> **NOTE:** Right-clicking on the Menu produces the same outcome.

– If you have selected a Server Core installation
1) Execute the following command line from command prompt to specify the optical disk drive (e.g. D drive).

cd /d d:\017\win\winnt\bin\oschk

```
C:\Users\administrator>cd /d D:\017\win\winnt\bin\oschk
```

2) Type following command line and press **Enter**.

oschk.bat

```
D:\017\win\winnt\bin\oschk>oschk.bat
```
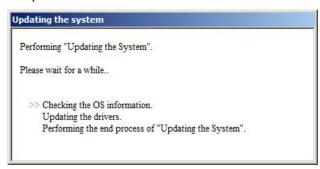
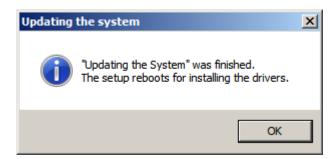**4.** The following box appears.

5. Read the message, and then click [OK].

The update starts.

> **NOTE:** The following box appears during the update if you have deployed a full installation of Windows Server 2008. Wait until the update completes.
>
>

6. When the following message appears, click [OK] to restart the system.

The system has been updated.

DRIVER INSTALLATION AND ADVANCED SETTINGS

This section describes on how to install and setup various standard drivers mounted on the device.

For the information on installing and setting up the driver that is not described in this section, please refer to the document attached to the driver.

LAN Driver and PROSet

Please refer to Chapter 5 "Installing and Setting Device Drivers" for Windows Server 2008 to install and setup LAN driver and PROSet.

Graphics Accelerator Driver

If you utilize standard graphics accelerator drivers, update your system with NEC EXPRESSBUILDER DVD-ROM attached to your system.
Standard graphics accelerator drivers will be installed automatically.

> **NOTE:** <Windows Server 2008>
>
> The graphics accelerator driver is supported only on a server running a full installation. Use VGA on a server running a Server Core installation.

Please follow the following procedure when you want to reinstall the driver individually.

1. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive.

    If the autorun menu is displayed, close menu screen.

2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].

3. Run "Install.bat" in the following directory.

    – Windows Server 2008 64-bit (x64) Edition:

      \017\win\winnt\ws2008x64\video

    – Windows Server 2008 32-bit (x86) Edition:

      \017\win\winnt\ws2008\video

4. Follow the message to continue the installation.

    If the dialog message "Digital Signature could not been found." appears, select [Yes] to continue.

5. Remove the NEC EXPRESSBUILDER DVD-ROM from the optical disk drive, restart the system.

Installing SCSI Controller Driver (N8103-75/95/107)

If you use the SCSI Controller N8103-75/95/107, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing SAS Controller Driver (N8103-104A)

If you use the SAS Controller N8103-104A, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing Fibre Channel Controller Driver (N8190-127/131/153/154)

If you use the Fibre Channel Controller N8190-127/131/153/154, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

About Windows Activation

Windows Server 2008 must be activated before you can use Windows Server 2008.

Windows activation process is as follows.

For a server running a full installation
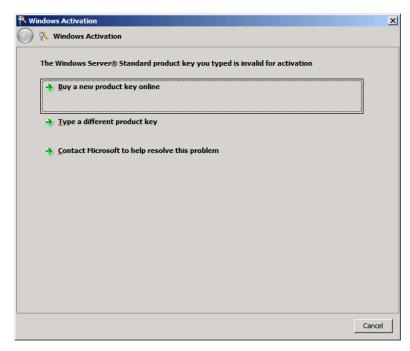
1.   Go to the Start menu, and in the Run dialog box, type **slui**, and press **Enter**.
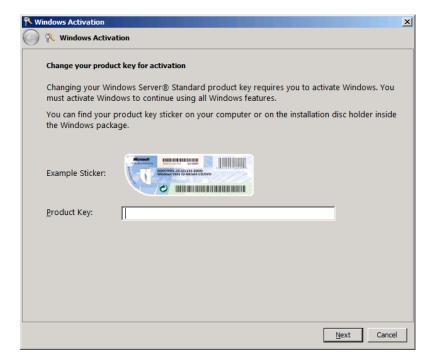
IMPORTANT: If the following message appears, Windows has already been activated on your system. Click [Close] to exit.
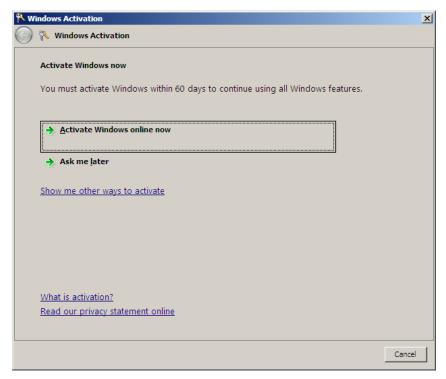
2. In the following screen, click [Type a different product key].

3. Type the product key shown on your COA label, and click [Next].

4. Activate Windows.

The Windows activation is complete.

For a server running a Server Core installation

1. At the command prompt, type **slmgr –dli**, and press **Enter**.

```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.0.6001]
Copyright (c) 2006 Microsoft Corporation.

C:\Users\Administrator>slmgr -dli
```

> **IMPORTANT:** If the following message appears, Windows has already been activated on your system. Click ☒ to exit.
>
> ```
> Windows Script Host                                          ×
>
> Name: Windows Server(R), ServerStandard edition
> Description: Windows Operating System - Windows Server(R), OEM_SLP
> channel
> Partial Product Key: 7CYMX
> License Status: Licensed
>
>                                                  [    OK    ]
> ```

2. Type **slmgr –ipk <PID>**, and press **Enter**.

   * PID is your product key on the COA label.

```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.0.6001]
Copyright (c) 2006 Microsoft Corporation.  All rights reserved.

C:\Users\Administrator>slmgr -ipk XXXXX-XXXXX-XXXXX-XXXXX-XXXXX_
```

3. Type **slmgr –dti** to obtain an installation ID for Windows activation, and press **Enter**.

```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.0.6001]
Copyright (c) 2006 Microsoft Corporation.  All rights reserved.

C:\Users\Administrator>slmgr -dti_
```

4. See "%systemroot%\system32\slui\phone.inf" for the phone number of the Microsoft customer service.

5. Call the above number, inform the representative of the installation ID which you obtained in step 3, and receive a confirmation ID.

6.   At the command prompt, type **slmgr –atp <CID>**, and press **Enter**.

* CID is the confirmation ID that you received from the call center.


```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.0.6001]
Copyright (c) 2006 Microsoft Corporation.  All rights reserved.

C:\Users\Administrator>slmgr -atp xxxxx-xxxxx-xxxxx-xxxxx-xxxxx_
```

The Windows activation is complete.

The procedure to set PAE option

If your 32-bit system has a memory capacity in excess of 4GB, setting PAE option will enable the system to be installed with over 4GB of memory.

> **IMPORTANT:** "PAE option" is not supported on Windows Server 2008 Standard.

In Windows Server 2008 system, the PAE option can be set by using Bcdedit.exe.

The setting procedure is as follows.

1. Click [Run] on [Start] menu.

2. Type "cmd.exe" in the [Open:] box to start command prompt.

3. Execute following command line.

   bcdedit /set pae forceenable

4. Reboot the system.

   The setting mentioned above enables after reboot.

5. Execute following command line on command prompt.

   bcdedit

   Confirm "pae ForceEnable" exists in "Windows boot loader".

The setting for PAE option is now completed.

Refer following site about Bcdedit.exe.

   "Boot Configuration Data Editor Frequently Asked Questions"

   http://technet.microsoft.com/en-us/library/cc721886(WS.10).aspx

SETTING FOR SOLVING PROBLEMS

Set for collecting memory dump using the procedure described in Chapter 5.

Appendix F

Installing Windows Server 2003 x64 Editions

This section explains how to install the Windows Server 2003 x64 Editions.

NOTICE

Read the following notes or information before installing the Windows Server 2003 x64 Editions.

Optional Board Supported by NEC EXPRESSBUILDER

The NEC EXPRESSBUILDER DVD-ROM attached to your server supports the following optional boards:

> **NOTE:** If you want to install the other boards by using a driver floppy disk ("OEM-Disk for Mass storage device"), except ones listed below, see "Installing with the OEM-Disk for Mass storage device".

- Controllers supporting installation of OS with Express Setup
    - N8103-129 RAID Controller (256 MB, RAID 0/1)*
    - N8103-130 RAID Controller (256 MB, RAID 0/1/5/6)*
    - Onboard RAID Controller (LSI Embedded MegaRAID™)
- Other controllers
    - N8103-75 SCSI Controller*
    - N8103-95 SCSI Controller*
    - N8103-104A SAS Controller*
    - N8103-107 SCSI Controller*
    * Option

Service Pack Which EXPRESSBUILDER Supports

The NEC EXPRESSBUILDER DVD-ROM attached to the server supports following combination of the OS installation media and Service Pack.

- Windows Server 2003 R2 x64 Edition

    – OS installation media (with Service Pack 2)
    – OS installation media (No Service Pack) + Service Pack 2
    – OS installation media (No Service Pack)

Installing Service Pack

You can install the Service Pack on the server. When the Service Pack is not attached to your system, prepare it by yourself.

Updating System

If you modified the Windows system, execute "Update the system" in the Autorun Menu.

Re-installing to the Hard Disk Drive which has been upgraded to Dynamic Disk

If you want to leave the existing partition when installing the system on the hard disk drive upgraded to Dynamic Disk, note the following issue:

- Do not select the partition that OS had been installed as the partition to install the OS newly.
- Select "Use the current File System" for the format of OS partition.

Mounting MO Device

Do not mount an MO device on your server during the Windows installation.

About Removable Media

Do not set removable media, such as DAT and LTO, into the device mounted on this computer during the Windows installation.

Floppy Disk Drive

The internal floppy disk drive is not included in your system at the standard configuration. Prepare the optional USB floppy disk drive if necessary.

About the System Partition Size

The system partition size can be calculated from the following formula.

Required partition size
= Size necessary to install the system + Paging File Size + Dump File Size + Application Size

Size necessary to install the system = 4100MB (Windows Server 2003 x64 Editions)

= 4100MB (Windows Server 2003 x64 Editions with ServicePack 2)

= 5900MB (Windows Server 2003 x64 Editions + Service Pack 2 CD-ROM)

Paging File Size (Recommended)	= Mounted Memory Size * 1.5
Dump file Size	= Mounted Memory Size + 1MB
Application Size	= Required Size

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
  Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.

- Regardless of the size of the mounted memory, or the Write debugging information (type of memory dump), the maximum size of the dump file is 'The size of the mounted memory + 1MB'.

- If you install any application program or the like, add necessary space to the partition to install these programs.

For example, if the mounted memory size is 1G (1,024MB), the partition size will be calculated by the above formula as follows:

4,100MB + (1,024MB * 1.5) + (1,024MB + 1MB) + Application Size
= 6,661MB + Application Size

Dividing into the partition of the recommended size into multiple disks as written below will solve problem that it cannot be reserved in one disk.

1. Set the "Size required for installation + Paging file size".

2. See Chapter 5 and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.

(If the disk does not have enough free space to enable the dump file size to be written, then after installing the system using the "Size required for installation + Paging file size", install an additional new disk.)

INSTALLING Windows Server 2003 x64 Editions

Preparations for Installation

- NEC EXPRESSBUILDER DVD-ROM

- Microsoft Windows Server 2003 R2 Standard x64 Edition (CD-ROM) / Microsoft Windows Server 2003 R2 Enterprise x64 Edition (CD-ROM)

- Windows Server 2003 x64 Editions Service Pack 2 (CD-ROM)

- User's Guide

- Getting Started

- Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER

Creating "Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER"

Before installing, create Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER.

> **NOTE:** If you have already "Windows Server 2003 x64 Edition
> OEM-Disk for EXPRESSBUILDER" for NEC Express5800 Server
> which you are going to install Windows Server 2003 x64 Editions, you
> do not need to create it again.

You can create Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER with the following two procedures.

Create from the menu which appears when running NEC Express5800 Server with NEC EXPRESSBUILDER.

If you have only NEC Express5800 Server to create Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER, use this procedure.

If Windows Server 2003 or Windows can be operated on NEC Express5800 Server, you can use the other procedure described later.

Follow the steps below.

1. Prepare one Flash FDD, or one USB floppy disk drive and 3.5-inch floppy disk.

2. Turn on your NEC Express5800 Server.

3. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive of the server.

4. Press the RESET switch or press **Ctrl**, **Alt** and **Delete** to reboot the server. (You may also turn off and then on again to reboot the server.)

    The system will boot from the DVD-ROM and NEC EXPRESSBUILDER starts.

5. Select [Create the OEM-Disk for Windows] from [Tools Menu] step.

6. Connect the Flash FDD or the USB floppy disk drive. (If you use the floppy disk drive, insert a floppy disk into it.)

7. Select [Create an Windows Server 2003 x64 Editions OEM-Disk for EXPRESSBUILDER] at [Create OEM-Disk] and click [Perform].

8. Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER will be created.

Write-protect and attach a label, then keep it safely.

> **IMPORTANT:** If you have created "OEM-Disk" in the Flash FDD, disconnect the Flash FDD after NEC EXPRESSBUILDER had been shut down.

> **NOTE:** If the following message is displayed, the floppy disk is write-protected.

Cancel write-protected state.

If you have already cancelled write-protected state, connect the floppy disk drive again.

Create from [Autorun Menu]

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

You can create Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER from [Autorun Menu], if you have the computer on which the above operating systems operate.

Follow the steps below.

1. Prepare one Flash FDD, or one USB floppy disk drive and 3.5-inch floppy disk.

2. Start the Operating System.

3. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive of the server.

The Menu will appear.

4. Connect the Flash FDD or the USB floppy disk drive. (If you use the floppy disk drive, insert a floppy disk into it.)

5. Click [Create drive disk] and select [OEM-Disk for Windows Server 2003 x64 Edition].

> **NOTE:** You can do the same operation with the menu appeared by the Right-click.

6. Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER will be created.

Write-protect and attach a label, then keep it safely.

Windows Server 2003 x64 Editions Clean Installation

This section explains how to perform a clean installation of Windows Server 2003 x64 Editions.

IMPORTANT:

- If you have created the OEM-Disk into the Flash FDD, connect the Flash FDD before you start the system.

- If you have created OEM-Disk into the floppy disk, connect the USB floppy disk drive before you start the system.

---

1. Turn on the system power.

2. Insert the Windows Server 2003 x64 Edition CD-ROM into the optical disk drive.

3. Press **Ctrl** + **Alt** + **Delete** to reset the system.

After a bootable operating system has been installed on the hard disk drive, press **Enter** while the message "Press any key to boot from CD..." is displayed at the top of the screen.

If no bootable operating system exists on the hard disk drive, this step is unnecessary.

The Windows Server 2003 x64 Editions setup screen will appear.

If the screen is not displayed, **Enter** was not pressed properly.

Begin after turning on the system power again.

4. If the RAID Controller/Option Controller is used, press **F6** in a few seconds when the window is in either of the following states.

- "Setup is inspecting your computer's hardware configuration ..." or "Press F6 if you need to install a third party SCSI or RAID driver..." is displayed.
- A screen with a solid blue background is displayed.

IMPORTANT:

- There is no visible indication on screen when F6 has been pressed.

- If the RAID Controller/Option Controller is not used, you do not need to press F6,and go to Step 12.

---

5. The following message is displayed.

Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter.
Currently, Setup will load support for the following mass storage devices.

<If the RAID Controller is used>

Press S, and go to Step 6.

<If the RAID Controller is not used>

Go to Step 8.

6.   The following message is displayed.

> Please insert the disk labeled
> manufacturer-supplied hardware support disk
> into Drive A:
> *Press ENTER when ready.

If you use the floppy disk drive, insert the Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER into the floppy disk drive, and press **Enter**.

> **NOTE:** If you use the Flash FDD, the message above is not displayed.

A list of mass storage devices is displayed.

> **IMPORTANT:** If you have created the OEM-Disk into the Flash FDD, connect the Flash FDD before you start the system.

7.   Select the proper Controller and press **Enter**.

– [LSI Embedded MegaRAID (Windows XP/2003 64-bit)]
  (When Onboard RAID Controller (LSI Embedded MegaRAID™) is used.)

– [LSI MegaRAID SAS RAID Controller Driver (Server 2003 for x64)]
  (When N8103-129/130 RAID Controller is installed.)

The screen of Step 5 is displayed.

8.   <If the SCSI Controller N8103-75/107 is connected>

Press **S**.

The screen of Step 6 is displayed. Press Enter, and go to Step 9.

<If the SCSI Controller N8103-75/107 is not connected>

Go to Step 10.

9. A list of mass storage devices is displayed.

Select the [Adaptec Ultra320 SCSI Cards (Windows 64-bit)] and press **Enter**.

IMPORTANT: If the following message is displayed when you use the N8103-75/107 SCSI controller, press **S**.

> The driver you provided seems to be newer than the Windows default driver.
> Windows already has a driver that you can use for "Adaptec Ultra 320 SCSI Cards (Windows64-bit)"
> Unless the device manufacturer prefers that you usethe driver on the floppy disk, you should use the driver in Windows.

The screen of Step 5 is displayed.

Go to Step 10.

10. <If the SAS Controller N8103-104A is connected>

Press **S**.

IMPORTANT:

- Insert the Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER into the floppy disk drive. If the floppy disk drive has already contained Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER, you do not need to insert the Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER.

- If you have created the OEM-Disk into the Flash FDD, connect the Flash FDD before you start the system.

The screen of Step 6 is displayed. Press **Enter**, and go to Step 11.

<If the SAS Controller N8103-104A is not connected>

Press **Enter**, and go to Step 12.

11. A list of mass storage devices is displayed.

Select the [LSI Fusion-MPT SAS Driver (Server 2003 x64)] and press **Enter**.

The screen of Step 5 is displayed.

Press **Enter**, and go to Step 12.

12. When the following message is shown, press **Enter** to start "Welcome to Setup".

> **IMPORTANT:** If you install Windows Server 2003 x64 Editions on the hard disk larger than 2,097,152MB (2TB), you can specify only a value equal to or less than 2,097,152MB as partition size.

13. When the installation of Windows Server 2003 x64 Edition has finished, the system reboots automatically.

14. The [Windows Setup] screen will be displayed after logged on to the system.

> **IMPORTANT:**
>
> ■ In this case, the [Windows Setup] screen may not be displayed. Be sure to install Microsoft Windows Server 2003 R2 x64 Edition DISC 2 according to the following procedures.
>
> ■ You can install Microsoft Windows Server 2003 R2 x64 Edition DISC 2 after the application of "System update". Be sure to install Microsoft Windows Server 2003 R2 x64 Edition DISC 2. In this case, note that the [Windows Setup] screen is not displayed.

15. Insert Microsoft Windows Server 2003 R2 x64 Edition DISC 2 CD-ROM into the optical disk drive.
Confirm the parameters and click [OK].

16. When the installation has completed, remove Microsoft Windows Server 2003 R2 x64 Edition DISC 2 CD-ROM from the optical disk drive, and restart the system.

After installation is completed, be sure to execute the tasks described in "Driver Installation and Advanced Settings" and "Updating the System" of this chapter.

Procedure for License Authentication

Product Key used in the procedure for license authentication should be matched with the COA label in which the product key contained in Windows Server 2003 is written.

> **NOTES:**
> - Execute the activation within 30 days. System may be locked after 30 days is passed.
> - COA label may be attached to your server.

Updating the System - Applying Service Pack -

Update the system in the situation below:

- CPU is expanded (expanded to single processor to multi-processor).
- Modified system configuration.
- Recovered the system using recovery process.

The system update brings the correction program provided by Microsoft to be applied to reinforce the system security. The system update is recommended.

It is necessary to use ServicePack2 or more. ServicePack 2 need not be applied again when Windows Server 2003 x64 Editions CD-ROM where ServicePack 2 is included is used and it is installed.

If you install Windows Server 2003 x64 Editions CD-ROM which contains Service Pack 2, you do not have to apply "Hotfix for Windows x64" or "Hotfix for Windows Server 2003 (KB921411)".

Go to the section of "Updating the System".

Perform "Updating the System" and application of the "Hotfix (KB921411)".

> **IMPORTANT:** In the situation below, make sure to apply "Updating the System" and "Hotfix (KB921411)".
> - Modified system configuration
> - Recovered the system using recovery process.

> **NOTE:** If you use Windows Server 2003 x64 Editions CD-ROM which includes Service Pack 2, the application of "Hotfix (KB921411)" is not required.

Application Process of the Hotfix (KB921411)

Apply the "Hotfix (KB921411)" before execute "Updating the System".

1. Log on to the system by the account with administrator authority to the server (such as administrator).

2. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive of the server.

3. Click Start menu and [Run], and then execute the following command.

<When Windows Server 2003 x64 Editions is used>

\017\win\winnt\w2k3amd\qfe\enu\kb921411.exe

4. When the following message is displayed, click [Next].

After that, follow the message to continue the process.

5. When the following message is displayed, make sure to click [Finish] to restart the system.

With that, application process of the Hotfix (KB921411) is finished.

Application Process of "Updating the System"

"Updating the System" applies the drivers necessary for NEC Express5800 Series.

Follow this process after Hotfix for Windows x64 (KB921411) or Hotfix for Windows Server 2003 (KB921411) had been applied.

> **NOTE:** If you install Windows CD-ROM that contains Service Pack 2 to your system, you do not have to apply Service pack 2 again.

1. Log on to the system with the account that has administrative privilege (e.g.administrator).

2. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive of server.

    The Autorun Menu will be displayed

3. Left-click on [Setup Windows], and then click [Update the system].

    > **NOTE:** Right-clicking on the Autorun Menu produces the same outcome.

4. When the following message appears, click [OK].

> **IMPORTANT:** There is no problem in operation though the following messages might be displayed while executing "Updating the system".
>
> It will disappear after a few seconds, and do not click [Cancel] while it is displayed.

NOTE: The following box appears during the update if you have deployed a full installation of Windows Server 2003 x64 Edition. Wait until the update completes.

> **Updating the system**
>
> Performing "Updating the System".
>
> Please wait for a while..
>
> >> Checking the OS information.
>   Updating the drivers.
>   Performing the end process of "Updating the System".

5. When the following message appears, "Updating the System" was finished.

> **Updating the system**   ☒
>
> ❓ "Updating the System" was finished.
>   The setup will apply the Service Pack continuously.
>
>   If you want to continue applying, click [Yes].
>   If you want to stop applying, click [No].
>
>   [Yes]   [No]

When you apply Service Pack: Click [Yes], and then go to Step 6.

When you don't apply Service Pack: Click [No], and then go to Step 8.

6. When the following message appears, click [Yes].

> **Applying the Service Pack**   ☒
>
> ❓ Applying the Service Pack.
>
>   If you want to continue applying, click [Yes] and
>   select the Service Pack (brows the file like an "e.g.").
>   If you want to stop applying, click [No].
>
>   e.g. XXXXXXXXXXXXXXX-XXXXX-ENU.EXE
>
>   [Yes]   [No]

7. When the following message appears, select a Service Pack and click [Open] and then, according to a message, please apply it.

8. When the following message appears, click [Yes] to restart the system.

The system has been updated.

Recovery Process
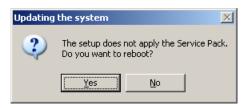
If "Updating the System" is executed before the application of the "Hotfix for Windows x64 (KB921411)", "!" may be displayed on the USB root hub.

If "!" is displayed on the USB root hub, perform application of the "Hotfix for Windows x64 (KB921411)" and the "Updating the System" according to the following process.

1. Start the Windows Explorer, and click [Tools] and [Folder Options].

2. Select [Files and Folders] - [Hidden files and folders] - [Show hidden files and folders] radio button from Advanced settings in the [View] tab.

3. Check off the following check box in the [Files and Folders] from Advanced settings in the [View] tab, and then click [OK].

Hide extensions for know file type

Hide protected operating system files [Recommended]

When the message "You have chosen to display protected operating system files..." is displayed, click [Yes].

4. Make sure of the files.

Open "<System drive:>\WINDOWS\system32\drivers" directory, and make sure usbhub.sys and usbport.sys are exists in the directory.

If you can not found them, copy the files according to the following process.

(1) Open "<System drive:>\WINDOWS\system32\dllcache" directory.

(2) Copy usbhub.sys and usbport.sys from the directory noted above to "<Systemdrive:>\WINDOWS\system32\drivers".

5. Restart the system.

6. Refer to [Application process of the Hotfix (KB921411)] and apply the "Hotfix for Windows x64 (KB921411)".

7. Refer to [Application process of "Updating the System"] and execute "Updating the System".

8. Restart the system.

With that, process is finished.

DRIVER INSTALLATION AND ADVANCED SETTINGS

This section describes on how to install and setup various standard drivers mounted on the device.

For the information on installing and setting up the driver that is not described in this section, please refer to the document attached to the driver.

LAN Driver and PROSet

LAN Driver

LAN drivers will be installed automatically.

PROSet

> **NOTE:** All of the operation that related to IntelR PROSet is must be executed by administrator privileges. Operation by [Remote Desktop Connection] is prohibited.
>
> Without changing any parameter when opened the properties of adapter teaming, please click the [Cancel] button for close the dialog.
>
> Click [OK] button will cause temporary loss of network connectivity.

PROSet is a utility that confirms the function of network contained in network driver.

Utilizing PROSet enables the following items:

- Confirm detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Setup of teaming.

Configuring several network adapters as one team provides the server a tolerant environment on any trouble and enhances throughput between the switches.

PROSet is necessary to utilize these features.

Follow the procedure below to install PROSet.

1. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive.

If the autorun menu is displayed, close menu screen.

2. The [Windows Explorer] dialog starts.

* The procedure in the case of the standard start menu

Click Start menu and click [Windows Explorer].

* The procedure in the case of the classic start menu

Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].

3. Run "dxsetup.exe" in the following directory.

\017\win\winnt\w2k3amd\r148\apps\prosetdx\winx64

The [Intel(R) PROSet - InstallShield Wizard] dialog starts.

4. Click [Next].

5. Choose "I accept the terms in the license agreement" and click [Next].

6. Click [Next].

7. Click [Install].

8. When [InstallShield Wizard Completed] window is displayed, click[Finished].

9. Remove the NEC EXPRESSBUILDER DVD-ROM from the optical disk drive, restart the system.

LAN Driver Setting

■ Link Speed

LAN drivers will be installed automatically, but the link speed and Duplex mode need to be specified manually.

IP addresses is not be able to set when the "Internet Protocol (TCP/IP)" check box OFF.

This phenomenon will occur with the certain condition.

Check ON the "Internet Protocol (TCP/IP)" check box and IP address will be able to set.

When PROSet is not installed

1. Open the [Device Manager].

2. Double-click [(Network Adapter Name)] in the list.

3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

4. Click [OK].

5. Restart the system.

When PROSet is installed

1. Open the [Device Manager].

2. Double-click [(Network Adapter Name)] in the list.

3. Click the [Link Speed] and specify the [Speed & Duplex] value the same as the value specified for HUB.

4. Click [OK].

5. Restart the system.

■ **WOL**

> **IMPORTANT:** WOL is supported by the standard network adapters only.

Refer to the following procedure for WOL (Wake On LAN) setting.

When PROSet is not installed

1. Start Device Manager.

2. Point to [Network adapters] and double click following adapter.

   Open the adapter [Properties].

   [Intel(R) 82576 Gigabit Dual Port Server Network Connection]

   [Intel(R) 82576 Gigabit Dual Port Server Network Connection #2]

3. Click [Power Management] tab and change setting in [Wake On LAN] according to the following list.

Setting item	Using WOL	Not using WOL
"Allow the computer to turn off this device to save power"	ON	ON
"Allow this device to bring the computer out of standby"	ON or OFF	OFF

> **IMPORTANT:** Please refer to follows about function of "Allow this device to bring...".
>
> ON: WOL work by DirectedPacket (*1), MagicPacket (*2) on hibernate or sleep state.
>
> OFF: WOL do not work by DirectedPacket, MagicPacket on hibernate or sleep state.
>
> *1 Packet with the Ethernet address of the adapter in Ethernet header or Packet with an IP address assigned to the adapter in IP header.
>
> *2 MagicPacket refers to a packet dedicated to WOL.

4. Click [Advanced] tab and point to [Enable PME].

5. Set in [Value] as follows.

   – Using WOL : ON

   – Not using WOL: OFF

6. Click [OK].

7. Restart the system.

When PROSet is installed

1. Start Device Manager.

2. Point to [Network adapters] and double click following adapter.

    Open the adapter [Properties].

    [Intel(R) 82576 Gigabit Dual Port Server Network Connection]

    [Intel(R) 82576 Gigabit Dual Port Server Network Connection #2]

3. Click [Power Management] tab and change setting in [Wake On LAN] according to the following list.

Setting item	Using WOL	Not using WOL
"Wake On Directed Packet"	ON or OFF	OFF
"Wake On Magic Packet"	ON	OFF
"Wake on Magic Packet from power off state"	ON	OFF
"Wake on Link"	OFF	OFF

    > **IMPORTANT:** Please refer to follows about function of "Wake On Directed Packet".
    >
    > ON: WOL work by DirectedPacket (*1) on hibernate or standby state.
    >
    > OFF: WOL do not work by DirectedPacket on hibernate or standby state.
    >
    > *1 Packet with the Ethernet address of the adapter in Ethernet header or Packet with an IP address assigned to the adapter in IP header.

    > **NOTES:**
    >
    > ■ [Power Saver Options] setting is not necessary to change.
    >
    > ■ Above setting will be maintained until manually resetting are executed.

4. Click [OK].

5. Restart the system.

Setup Team

Adapter Fault Tolerance (AFT) is a feature that creates a group containing more than one adapter and automatically converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

Adaptive Load Balancing (ALB) is a feature that creates a group containing more than one adapter and enhances the throughput by operating packet transmission from the server by all the adapters.

This feature includes AFT feature.

Switch Fault Tolerance (SFT) is a feature that provides a failover relationship between two ports when each port is connected to a separate switch.

SFT supports two ports per team.

Static Link Aggregation (SLA) accounts for the GEC and 802.3ad static protocols.

SLA is a switch-assisted teaming mode and requires configuring ports at both ends of the link: server interfaces and switch ports.

IMPORTANT:

- AFT/ALB setup must be operated after system update and restarting the system.

- All the adapters specified as a group of Adapter Teaming must exist on the same LAN. If they are connected to the separate switches, they will not work normally.

- The adapters specified as a group of Adaptive Load Balancing(ALB) can be connected to only Switching Hub.

- When exchange the mother board or option network card, make sure to remove the adapter team before exchanges and recreate the adapter team after exchange complete.

- Confirm the port setting of switching hub (L2) matches the server network adapter Teaming mode.

- Teaming is not supported with Windows Server Core.

- If you want to change the type of a teaming, be sure to remove the teaming first, then re-setup a new teaming. Do not use the function of PROSet to change the type of a teaming.

Create Team

1. Open the [Device Manager].

2. Open [Network adapters] → [Intel(R) xxx] properties.

3. Click [Teaming] tab and check the [Team this adapter with other adapters] check box.
    Click [New Team].

4. Fill the name of the team in [Specify a name for the team] and click [Next].

5. Include the adapter to the team and click [Next].

6. Select a team mode, and then click [Next].

    > **IMPORTANT:** Following team types are supported.
    >
    > - Adapter Fault Tolerance
    > - Adaptive Load Balancing
    > - Static Link Aggregation
    > - Switch Fault Tolerance

7. Click [Finish].

8. Click [TEAM: "Team name"] from [Device manager] → [Network adapters] to modify the team.
    Click [Settings] tab and click [Modify Team] button.

9. Refer to the following procedure to set the team member adapter priority status.

    – Set Primary

    Point the adapter and click [Set Primary] button.

    – Set Secondary

    Point the adapter and click [Set Secondary] button.

    > **NOTE:** Adapter priority config can be confirmed by the following procedure:
    >
    > 1. Click [TEAM: "Team name"] from [Device manager] → [Network adapters].
    > 2. Click [Settings] and confirm Adapters in team list.

10. Click [Test Switch] → [Run test] to confirm the adapter team is properly setup.
    Confirm the result in [Test results]

11. Restart the system.

Remove Team

1. Open the [Device Manager].

2. Click [Network adapters], and open [TEAM: "Team name"] properties.

3. Click [Setting] tab.

4. Click [Remove Team] button.

5. Click [Yes] to the message.

6. Confirm [TEAM: "Team name"] adapter is not existing in [Network adapters] tree and restart the system.

LAN Board Driver (N8104-111/112/119/120/121/122/125A/126)

Install the driver stored in NEC EXPRESSBUILDER DVD.

Installation of LAN Board Driver

1. Start Device Manager.

2. Click [Network adapters] and double-click [(Network Adapter Name)].

    [(Network Adapter Name) Properties] appears.

    > **NOTE:** [(Intel(R) PRO/1000...)] is the name of On-Board adapter. All
    > other names show the Optional Network Board.

3. Click [Driver] tab and click [Update Driver...]. [Hardware Update Wizard] appears.

4. Select the [Install from a list or specific location (Advanced)] radio button and click
    [Next].

5. Select the [Search for the best driver in these locations] radio button and uncheck the
    [Search removable media (floppy, CD-ROM...)] check box.

6. Check the [Include this location in the search] check box and when using [(N8104-111)],
    specify [\017\win\winnt\w2k3amd\r148\pro100\winx64\ndis5x].

    Then click [Next].

    When using [(N8104-112/119/120/121/122/125A/126)], specify
    [\017\win\winnt\w2k3amd\r148\pro1000\winx64\ndis5x].

    Then click [Next].

7. Click [Finish].

8. Restart the system.

LAN Board Driver (N8104-123A)

To install the driver, refer to the installation manual provided with the board and according to the
installation manual, use the driver stored in attached CD-ROM.

Graphics Accelerator Driver

If you utilize standard graphics accelerator drivers, update your system with NEC EXPRESSBUILDER DVD-ROM attached to your system.
Standard graphics accelerator drivers will be installed automatically.

Please follow the following procedure when you want to reinstall the driver individually.

1. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive.

If the autorun menu is displayed, close menu screen.

2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].

3. Run "Install.bat" in the following directory.

\017\win\winnt\w2k3amd\video\install.bat

4. Follow the message to continue the installation.

If the dialog message "Digital Signature could not been found." appears, select [Yes] to continue.

5. Remove the NEC EXPRESSBUILDER DVD-ROM from the optical disk drive, restart the system.

Installing SCSI Controller Driver (N8103-75/107)

If you use the SCSI Controller N8103-75/107, update your system with NEC EXPRESSBUILDER DVD-ROM attached to your system.

The SCSI Controller driver will be installed automatically.

Installing SCSI Controller Driver (N8103-95)

If you use the SCSI Controller N8103-95, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing SAS Controller Driver (N8103-104A)

If you use the SAS Controller N8103-104A, update your system with NEC EXPRESSBUILDER DVD-ROM attached to your system.

The SAS Controller driver will be installed automatically.

About Windows Activation
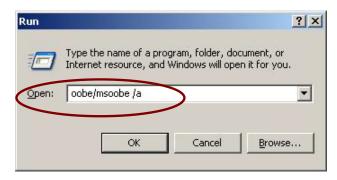
Windows Server 2003 x64 Editions must be activated before you can use Windows Server 2003 x64 Editions.

Windows activation process is as follows.

> **NOTE:** When you use Windows Server 2003 R2 x64 Editions BackUp CD-ROM, activation process is not needed.

1.   Click [Run] on [Start] menu.

Type as follows in the [Open:] box, and click [OK].

oobe/msoobe /a

2.   When the screen as follows is displayed, click [Next].

The following screen is displayed.

Generating new Installation ID...

3. Process "Windows activation" according to the following message.

SETTING FOR SOLVING PROBLEMS

Set for collecting memory dump using the procedure described in Chapter 5.

Appendix G

Installing Windows Server 2003

This section explains how to install the Windows Server 2003.

BEFORE INSTALLING WINDOWS SERVER 2003

Read the following notes or information before installing the Windows Server 2003.

Optional Board Supported by NEC EXPRESSBUILDER

The NEC EXPRESSBUILDER DVD-ROM attached to your server supports the following optional boards:

> **NOTE:** If you want to install the other boards by using a driver floppy disk ("OEM-Disk for Mass storage device"), except ones listed below, see "Installing with the OEM-Disk for Mass storage device".

- Controllers supporting installation of OS with Express Setup
  - N8103-129 RAID Controller (256 MB, RAID 0/1)*
  - N8103-130 RAID Controller (256 MB, RAID0/1/5/6)*
  - Onboard RAID Controller (LSI Embedded MegaRAID™)
- Other controllers
  - N8103-75 SCSI Controller*
  - N8103-95 SCSI Controller*
  - N8103-104A SAS Controller*
  - N8103-107 SCSI Controller*
  - * Option

Service Pack Which EXPRESSBUILDER Supports

The NEC EXPRESSBUILDER DVD-ROM attached to the server supports following combination of the OS installation media and Service Pack.

- Windows Server 2003 R2
  - OS installation media (with Service Pack 2)
  - OS installation media (No Service Pack) + Service Pack 2
  - OS installation media (No Service Pack)
- Windows Server 2003
  - OS installation media (with Service Pack 1)
  - OS installation media (with Service Pack 1) + Service Pack 2

Application of Service Pack

You can install the Service Pack on the server. When the Service Pack is not attached to your system, prepare it by yourself.

When installing Windows Server 2003 R2, it is not necessary to apply Service Pack 1.

Updating System

If you modified the Windows system, execute "Update Express5800 system" in the Autorun Menu.

Re-installing to the Hard Disk which has been upgraded to Dynamic Disk

If you want to leave the existing partition when installing the system on the hard disk upgraded to Dynamic Disk, note the following issue:

- Do not select the partition that OS had been installed as the partition to install the OS newly.
- Select "Use the current File System" for the format of OS partition.

Mounting MO Device

Do not mount an MO device on your server during the Windows installation.

About Removable Media

Do not set removable media, such as DAT and LTO, into the device mounted on this computer during the Windows installation.

Floppy Disk Drive

The internal floppy disk drive is not included in your system at the standard configuration. Prepare the optional USB floppy disk drive if necessary.

About the Upgrade to Windows Server 2003 R2

The "in-place upgrade" from Windows Server 2003 to Windows Server 2003 R2 is not recommended because it may overwrite any files or registries, and cause unexpected impact to the system or the applications.

If you install Windows Server 2003 R2, backup user data referring "Windows Server 2003 Clean Installation", and reinstall Windows Server 2003 R2.

> **NOTE:** "in-place upgrade" is to perform overwrite upgrade from Windows Server 2003 which already installed to Windows Server 2003 R2.

About the System Partition Size

The size for the partition that the system is to be installed can be calculated from the following formula.

Required partition size
= Size necessary to install the system + Paging File Size + Dump File Size + Application Size

Size necessary to install the system = 3500MB (Windows Server 2003 R2)

= 3500MB (Windows Server 2003 with Service Pack 1)

= 3500MB (Windows Server 2003 R2 with Service Pack 2)

= 5300MB (Windows Server 2003 R2 + Service Pack 2)

= 5300MB (Windows Server 2003 with Service Pack 1 + Service Pack 2)

Paging File Size (Recommended) = Mounted Memory Size * 1.5
Dump file Size = Mounted Memory Size + 12MB
Application Size = Required Size

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
  Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.

- The maximum paging file size which can be set on one partition is 4095MB. If the above paging file size exceeds 4095MB, specify 4095MB for the paging file size.

- The maximum dump file size for the system with more than 2GB memory mounted is '2048MB + 12MB'.

- If you install any application program or the like, add necessary space to the partition to install these programs.

For example, if the mounted memory size is 1GB (1,024MB), the partition size will be calculated by the above formula as follows:

3,500MB + (1,024MB * 1.5) + (1,024MB + 12MB) + Application Size
= 6,072MB + Application Size

Dividing into the partition of the recommended size into multiple disks as written below will solve problem that it cannot be reserved in one disk.

1. Set the "Size required for installation + Paging file size".

2. See Chapter 5 and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.
   (If the disk does not have enough free space to enable the dump file size to be written, then after installing the system using the "Size required for installation + Paging file size", install an additional new disk.)

INSTALLING WINDOWS SERVER 2003

Preparations for Installation

- NEC EXPRESSBUILDER DVD-ROM

- Microsoft Windows Server 2003 Standard Edition (CD-ROM)/ Microsoft Windows Server 2003 Enterprise Edition (CD-ROM), Microsoft Windows Server 2003 R2 Standard Edition (CD-ROM)/ Microsoft Windows Server 2003 R2 Enterprise Edition (CD-ROM)

- Windows Server 2003 Service Pack (CD-ROM)

- User's Guide

- Getting Started

- Windows Server 2003 OEM-Disk for EXPRESSBUILDER

Creating "Windows Server 2003 OEM-Disk for EXPRESSBUILDER"

Before installing, create Windows Server 2003 OEM-Disk for EXPRESSBUILDER.

> **NOTE:** If you have already "Windows Server 2003 OEM-Disk for EXPRESSBUILDER" for NEC Express5800 Server which you are going to install Windows Server 2003, you do not need to create it again.

You can create Windows Server 2003 OEM-Disk for EXPRESSBUILDER with the following two procedures.

Create from the menu which appears when running NEC Express5800 Server with NEC EXPRESSBUILDER.

If you have only NEC Express5800 Server to create Windows Server 2003 OEM-Disk for EXPRESSBUILDER, use this procedure.

If Windows Server 2003 or Windows can be operated on NEC Express5800 Server, you can use the other procedure described later.

Follow the steps below.

1. Prepare one Flash FDD, or one USB floppy disk drive and 3.5-inch floppy disk.

2. Turn on your NEC Express5800 Server.

3. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive of the server.

4. Press the RESET switch or press **Ctrl**, **Alt** and **Delete** to reboot the server. (You may also turn off and then on again to reboot the server.)

The system will boot from the DVD-ROM and NEC EXPRESSBUILDER starts.

5. Select [Create the OEM-DISK for Windows] from [Tools Menu] step.

6. Connect the Flash FDD or the USB floppy disk drive. (If you use the floppy disk drive, insert a floppy disk into it.)

7. Select [Create an Windows Server 2003 OEM-Disk for EXPRESSBUILDER] at [Create OEM-Disk] and click [Perform].

8. Windows Server 2003 OEM-Disk for EXPRESSBUILDER will be created.

Write-protect and attach a label, then keep it safely.

> **IMPORTANT:** If you have created "OEM-Disk" in the Flash FDD, disconnect the Flash FDD after NEC EXPRESSBUILDER had been shut down.

> **NOTE:** If the following message is displayed, the floppy disk is write-protected.

Cancel write-protected state.

If you have already cancelled write-protected state, connect the floppy disk drive again.

Create from [Autorun Menu]

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

You can create Windows Server 2003 OEM-Disk for EXPRESSBUILDER from [Autorun Menu], if you have the computer on which the above operating systems operate.

Follow the steps below.

1.   Prepare one Flash FDD, or one USB floppy disk drive and 3.5-inch floppy disk.

2.   Start the Operating System.

3.   Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive of the server.

     The Menu will appear.

4.   Connect the Flash FDD or the USB floppy disk drive. (If you use the floppy disk drive, insert a floppy disk into it.)

5.   Click [Create drive disk] and select [OEM-Disk for Windows Server 2003].

     NOTE: You can do the same operation with the menu appeared by the Right-click.

6.   Windows Server 2003 OEM-Disk for EXPRESSBUILDER will be created.

     Write-protect and attach a label, then keep it safely.

Windows Server 2003 Clean Installation

This section explains how to perform a clean installation of Windows Server 2003.

> **IMPORTANT:**
> - If you have created the OEM-Disk into the Flash FDD, connect the Flash FDD before you start the system.
> - If you have created OEM-Disk into the floppy disk, connect the USB floppy disk drive before you start the system.

1. Turn on the system power.

2. Insert the Windows Server 2003 CD-ROM into the optical disk drive.

3. Press **Ctrl** + **Alt** + **Delete** to reset the system.

After a bootable operating system has been installed on the hard disk drive, press **Enter** while the message "Press any key to boot from CD..." is displayed at the top of the screen.

If no bootable operating system exists on the hard disk drive, this step is unnecessary.

The Windows Server 2003 setup screen will appear.

If the screen is not displayed, **Enter** was not pressed properly.

Begin after turning on the system power again.

4. If the RAID Controller/Option Controller is used, press F6 in a few seconds when the window is in either of the following states.

– "Setup is inspecting your computer's hardware configuration ..." or "Press F6 if you need to install a third party SCSI or RAID driver..." is displayed.
– A screen with a solid blue background is displayed.

> **IMPORTANT:**
> - There is no visible indication on screen when F6 has been pressed.
> - If the RAID Controller/Option Controller is not used, you do not need to press F6, and go to Step 12.

5. The following message is displayed.

> Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter.
> Currently, Setup will load support for the following mass storage devices.

<If the RAID Controller is used>

Press S, and go to Step 6.

<If the RAID Controller is not used>

Go to Step 8.

6.   The following message is displayed.

> Please insert the disk labeled
> manufacturer-supplied hardware support disk
> into Drive A:
> *Press ENTER when ready.

If you use the floppy disk drive, insert the Windows Server 2003 OEM-Disk for
EXPRESSBUILDER into the floppy disk drive, and press **Enter**.

> **NOTE:** If you use the Flash FDD, the message above is not displayed.

A list of mass storage devices is displayed.

> **IMPORTANT:** If you have created the OEM-Disk into the Flash FDD,
> connect the Flash FDD before you start the system.

7.   Select the proper Controller and press **Enter**.

–   [LSI Embedded MegaRAID (Windows XP/2003 32-bit)]
     (When Onboard RAID Controller (LSI Embedded MegaRAID™) is used.)

–   [LSI MegaRAID SAS RAID Controller Driver (Server 2003 32-bit)]
     (When N8103-129/130 RAID Controller is installed.)

The screen of Step 5 is displayed.

8.   <If the SCSI Controller N8103-75/107 is connected>

Press **S**.

The screen of Step 6 is displayed. Press **Enter**, and go to Step 9.

<If the SCSI Controller N8103-75/107 is not connected>

Go to Step 10.

9. A list of mass storage devices is displayed.

Select the [Adaptec Ultra320 SCSI Cards (Windows 32-bit)] and press **Enter**.

> **IMPORTANT:** If the following message is displayed when you use the N8103-75/107 SCSI controller, press **S**.
>
> > The driver you provided seems to be newer than the Windows default driver.
> > Windows already has a driver that you can use for "Adaptec Ultra320 SCSI Cards (Windows 32-bit)"
> > Unless the device manufacturer prefers that you use the driver on the floppy disk, you should use the driver in Windows.

The screen of Step 5 is displayed.

Go to Step 10.

10. <If the SAS Controller N8103-104A is connected>

Press **S**.

> **IMPORTANT:**
>
> - Insert the Windows Server 2003 OEM-Disk for EXPRESSBUILDER into the floppy disk drive. If the floppy disk drive has already contained Windows Server 2003 OEM-Disk for EXPRESSBUILDER, you do not need to insert the Windows Server 2003 OEM-Disk for EXPRESSBUILDER.
>
> - If you have created the OEM-Disk into the Flash FDD, connect the Flash FDD before you start the system.

The screen of Step 6 is displayed. Press **Enter**, and go to Step 11.

<If the SAS Controller N8103-104A is not connected>

Press **Enter**, and go to Step 12.

11. A list of mass storage devices is displayed.

Select the [LSI Fusion-MPT SAS Driver (Server 2003 32-bit)] and press **Enter**.

The screen of Step 5 is displayed.

Press **Enter**, and go to Step 12.

12. When the following message is shown, press **Enter** to start "Welcome to Setup".

Windows Server 2003, XXXXXXXXXX Edition Setup

Welcome to Setup.

> **IMPORTANT:** If you install Windows Server 2003 on the hard disk
> larger than 2,097,152MB(2TB), you can specify only a value equal to
> or less than 2,097,152MB as partition size.

13. When the installation of Windows Server 2003 has finished, the system reboots
automatically.

– Windows Server 2003 has been installed: Go to the step 17.
– Windows Server 2003 R2 has been installed: Go to the step 14.

14. When Windows Server 2003 R2 has been installed, the [Windows Setup] screen will be
displayed after logged on to the system.

> **IMPORTANT:**
>
> ■ In this case, the [Windows Setup] screen may not be displayed.
>   Be sure to install Microsoft Windows Server 2003 R2 DISC 2
>   according to the following procedures.
>
> ■ You can install Microsoft Windows Server 2003 R2 DISC 2 after
>   the application of "System update".
>   Be sure to install Microsoft Windows Server 2003 R2 DISC 2.
>   In this case, note that the [Windows Setup] screen is not displayed.

15. Insert Microsoft Windows Server 2003 R2 DISC 2 CD-ROM into the optical disk drive.

Confirm the parameters and click [OK].

16. When the installation has completed, remove Microsoft Windows Server 2003 R2 DISC 2
CD-ROM from the optical disk drive, and restart the system.

17. When the installation has completed, be sure to execute the tasks described in "Driver
Installation and Advanced Settings" and "Updating the System" of manual.

Procedure for License Authentication

Product Key used in the procedure for license authentication should be matched with the COA label in which the product key contained in Windows Server 2003 is written.

NOTES:

- Execute the activation within 30 days. System may be locked after 30 days is passed.

- COA label may be attached to your server.

Updating the System - Applying Service Pack -

Update the system in the situation below:

- CPU is expanded (expanded to single processor to multi-processor).

- Modified system configuration.

- Recovered the system using recovery process.

The system update brings the correction program provided by Microsoft to be applied to reinforce the system security. The system update is recommended.

Service Pack 2 need not be applied again when Windows Server 2003 CD-ROM which Service Pack 2 is included is used and it is installed.

Go to the section of "Updating the System".

Perform "Updating the System" and application of the "Hotfix (KB921411)".

> **IMPORTANT:** In the situation below, make sure to apply "Updating the System" and "Hotfix (KB921411)".
>
> - Modified system configuration
>
> - Recovered the system using recovery process.

> **NOTE:** If you use Windows Server 2003 CD-ROM which includes Service Pack 2, the application of "Hotfix (KB921411)" is not required.

Application Process of the Hotfix (KB921411)

Apply the "Hotfix (KB921411)" before execute "Updating the System".

1. Log on to the system by the account with administrator authority to the server (such as administrator).

2. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive of the server.

3. Click Start menu and [Run], and then execute the following command.

   <When the English version of Windows Server 2003 R2 is used>

   \017\win\winnt\dotnet\qfe\enu\kb921411.exe

   <When the Simplified Chinese version of Windows Server 2003 R2 is used>

   \017\win\winnt\dotnet\qfe\chs\kb921411.exe

   <When the Traditional Chinese version of Windows Server 2003 R2 is used>

   \017\win\winnt\dotnet\qfe\cht\kb921411.exe

4. When the following message is displayed, click [Next].

After that, follow the message to continue the process.

5. When the following message is displayed, make sure to click [Finish] to restart the system.

With that, application process of the Hotfix (KB921411) is finished.

Application Process of "Updating the System"

"Updating the System" applies the drivers necessary for NEC Express5800 Series.

Follow this process after Hotfix for Windows Server 2003 (KB921411) had been applied.

> **NOTE:** If you install Windows CD-ROM that contains Service Pack 2 to your system, you do not have to apply Service pack 2 again.

1. Log on to the system with the account that has administrative privilege (e.g. administrator).

2. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive of server.

    The Autorun Menu will be displayed

3. Left-click on [Setup Windows], and then click [Update the system].

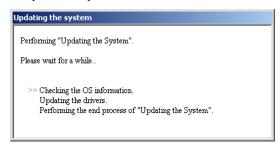> **NOTE:** Right-clicking on the Autorun Menu produces the same outcome.

4. When the following message appears, click [OK].

> **IMPORTANT:** There is no problem in operation though the following messages might be displayed while executing "Updating the system". It is not displayed after a few seconds, and please does not push the [Cancel] button while it is displayed.

NOTE: The following box appears during the update if you have deployed a full installation of Windows Server 2003.
Wait until the update completes.

Updating the system

Performing "Updating the System".

Please wait for a while..

>> Checking the OS information.
   Updating the drivers.
   Performing the end process of "Updating the System".

5. When the following message appears, "Updating the System" was finished.

Updating the system

"Updating the System" was finished.
The setup will apply the Service Pack continuously.

If you want to continue applying, click [Yes].
If you want to stop applying, click [No].

[Yes]   [No]

When you apply Service Pack: Click [Yes], and then go to Step 6.

When you don't apply Service Pack: Click [No], and then go to Step 8.

6. When the following message appears, click [Yes].

Applying the Service Pack

Applying the Service Pack.

If you want to continue applying, click [Yes] and
 select the Service Pack (brows the file like an "e.g.").
If you want to stop applying, click [No].

e.g. XXXXXXXXXXXXXX-XXXXX-ENU.EXE

[Yes]   [No]

7. When the following message appears, select a Service Pack and click [Open] and then, according to a message, please apply it.

8. When the following message appears, click [Yes] to restart the system.

The system has been updated.

Recovery Process

If "Updating the System" is executed before the application of the "Hotfix for Windows Server 2003 (KB921411)", "!" may be displayed on the USB root hub.

If "!" is displayed on the USB root hub, perform application of the "Hotfix for Windows Server 2003 (KB921411)" and the "Updating the System" according to the following process.

1. Start the Windows Explorer, and click [Tools] and [Folder Options].

2. Select [Files and Folders] - [Hidden files and folders] - [Show hidden files and folders] radio button from Advanced settings in the [View] tab.

3. Check off the following check box in the [Files and Folders] from Advanced settings in the [View] tab, and then click [OK].

Hide extensions for know file type

Hide protected operating system files [Recommended]

When the message "You have chosen to display protected operating system files..." is displayed, click [Yes].

4. Make sure of the files.

Open "<System drive:>\WINDOWS\system32\drivers" directory, and make sure usbhub.sys and usbport.sys are exists in the directory.

If you can not found them, copy the files according to the following process.

(1) Open "<System drive:>\WINDOWS\system32\dllcache" directory.

(2) Copy usbhub.sys and usbport.sys from the directory noted above to "<Systemdrive:>\WINDOWS\system32\drivers".

5. Restart the system.

6. Refer to [Application process of the Hotfix (KB921411)] and apply the "Hotfix for Windows Server 2003 (KB921411)".

7. Refer to [Application process of "Updating the System"] and execute "Updating the System".

8. Restart the system.

With that, process is finished.

DRIVER INSTALLATION AND ADVANCED SETTINGS

This section describes on how to install and setup various standard drivers mounted on the device.

For the information on installing and setting up the driver that is not described in this section, please refer to the document attached to the driver.

LAN Driver and PROSet

Please refer to Chapter 5 "Installing and Setting Device Drivers" for Windows Server 2003 to install and setup LAN driver and PROSet.

Graphics Accelerator Driver

If you utilize standard graphics accelerator drivers, update your system with NEC EXPRESSBUILDER DVD-ROM attached to your system.
Standard graphics accelerator drivers will be installed automatically.

Please follow the following procedure when you want to reinstall the driver individually.

 1. Insert the NEC EXPRESSBUILDER DVD-ROM into the optical disk drive.

     If the autorun menu is displayed, close menu screen.

 2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].

 3. Run "Install.bat" in the following directory.

     \017\win\winnt\dotnet\video\install.bat

 4. Follow the message to continue the installation.

     If the dialog message "Digital Signature could not been found." appears, select [Yes] to continue.

 5. Remove the NEC EXPRESSBUILDER DVD-ROM from the optical disk drive, restart the system.

Installing SCSI Controller Driver (N8103-75/95/107)

If you use the SCSI Controller N8103-75/95/107, update your system with NEC EXPRESSBUILDER DVD-ROM attached to your system.

The SCSI Controller driver will be installed automatically.

Installing SAS Controller Driver (N8103-104A)

If you use the SAS Controller N8103-104A, update your system with NEC EXPRESSBUILDER DVD-ROM attached to your system.

The SAS Controller driver will be installed automatically.

About Windows Activation

Windows Server 2003 must be activated before you can use Windows Server 2003.

Windows activation process is as follows.

> **NOTE:** When you use Windows Server 2003 R2 Backup CD-ROM, activation process is not needed.

1. Click [Run] on [Start] menu.

Type as follows in the [Open:] box, and click [OK].

oobe/msoobe /a

2. When the screen as follows is displayed, click [Next].

The following screen is displayed.

3. Process "Windows activation" according to the following message.

The procedure to set PAE option

If your 32-bit system has a memory capacity in excess of 4GB, setting PAE option will enable the system to be installed with over 4GB of memory.

> **IMPORTANT:**
>
> However, the Microsoft operating system products which support /PAE switch option are limited.
>
> Refer to the following article in Microsoft Knowledge Base to check the supported products.
>
> Microsoft Knowledge Base - Article ID: 291988
> "A description of the 4GB RAM tuning feature and the Physical Address Extension switch"

In Windows Server 2003 system, the PAE option can be set by editing boot.ini.

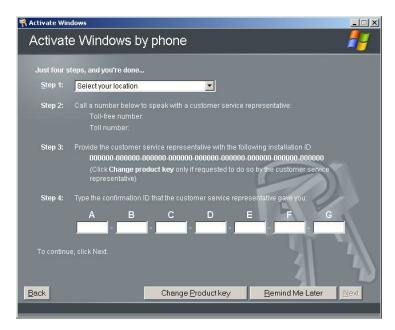Below is the example on how to add /PAE switch to Boot.ini file.

1. Click [Start], point to [Settings], and then click [Control Panel].

2. In [Control Panel], double-click [System].

    [System Properties] dialog box will be shown.

3. Click the [Advanced] tab, and then click [Settings] under [Setup and Recovery].

4. Under [System Setup], click [Edit] to open [Boot.ini].

5. Add "/PAE" to [Operating Systems] section in [Boot.ini] file, and then save it.

    ```
    <Example of Boot.ini file>
    [boot loader]
    timeout=30
    default=multi(0)disk(0)rdisk(0)partition(2)\WINDOWS
    [operating systems]
    multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003 "
    /fastdetect
    multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003 ,
    PAE" /fastdetect /PAE
    C:\CMDCONS\BOOTSECT.DAT="Microsoft Windows Recovery Console " /cmdcons
    ```

    This is the end of editing Boot.ini file.

> **NOTE:** If you choose one of the items in the "Default operating system" drop-down list box in [Setup and Recovery] group box, you can make your system start automatically from the switch you specified.

SETTING FOR SOLVING PROBLEMS

Set for collecting memory dump using the procedure described in Chapter 5.

Appendix H

Using a Client Computer Which Has a CD Drive

The NEC EXPRESSBUILDER disk is DVD so that a client computer which you want to use for managing the server needs a DVD drive.

If you want to install the management software of EXPRESSBUILDER to the client without the DVD drive, make a CD-R from EXPRESSBUILDER DVD-ROM according to the following steps.

> **NOTE:** This procedure can copy only one CD at the purpose of installing the management software to the client.

1. Insert the EXPRESSBUILDER DVD-ROM to the computer which has a DVD drive.

2. If Autorun menu appears, close the menu.

3. Copy the below files of EXPRESSBUILDER to a hard disk by using Explorer.

   \(root folder): copy version.xml

   \017

   ───\ar_menu : copy this sub-folder

   ───\doc : copy this sub-folder

   ───\win : copy this sub-folder

4. Delete the ar_menu\autorun_menu.xml on the hard disk, and rename the ar_menu\autorun_en.xml on the hard disk to the autorun_menu.xml.

5. Copy the above files/folders to a CD-R.

   Match the root folder when you burn a CD-R.

6. Delete the files/folders that you copied at step 3.

7. Insert the CD-R to a client computer which you want to install the management software.

8. Kick the below file of the CD-R by using Explorer.

   \017\ar_menu\autorun_menu.exe   (for Windows 32 bit edition)

   autorun_menu_x64.exe   (for Windows 64 bit edition)

(This page is intentionally left blank.)

Appendix I

Accessing Power and Performance Data

This chapter describes how to collect the power and performance data, including power consumption, inlet air temperature, and processor utilization of NEC Express server in usual operation. These are defined in ENERGY STAR® Program Requirements for Computer Servers and must be available to users.

The sample program shown below is verified to be run normally on Windows Server® 2008 Enterprise 32bit (x86) Edition.

POWER CONSUMPTION

Run the following commands to access power consumption readings on BMC (Baseboard Management Controller) via IPMI (Intelligen Platform Management Interface).

Network Function Code: 3Eh (Controller-specific OEM)

Command Code: 0Bh (Get Current Sensor Data)

Shown below is a sample file created by Visual Basic Script (e.g. Power.vbs).

```
' Start Script
Option Explicit

' Prepare for IPMI Driver
Dim osvc, oclass
Dim oinstance, oipmi
set osvc = getobject("winmgmts:root\wmi")
set oclass = osvc.get("microsoft_ipmi")
for each oinstance in osvc.instancesof("microsoft_ipmi")
        set oipmi = oinstance
next

'Format the IPMI command request
Dim oinparams
set oinparams = oclass.methods_("requestresponse").inparameters
oinparams.networkfunction = &h3e    ' OEM NetworkFunction
oinparams.lun = 0
oinparams.responderaddress = &h20
oinparams.command = &h0b           ' Get Current Sensor Data Command
oinparams.requestdatasize = 0
```

```
'call the driver
Dim outparams
set outparams = oipmi.execmethod_("requestresponse",oinparams)

WScript.Echo " Completion Code = 0x" & hex(outparams.Completioncode)
If outparams.Completioncode <> 0 Then
    Wscript.Echo " Not supported"
Else
    'WScript.Echo " Data LS Byte    = 0x" & hex(outparams.ResponseData(1))
    'WScript.Echo " Data MS Byte    = 0x" & hex(outparams.ResponseData(2))
    WScript.Echo " Power Consumption = " & outparams.ResponseData(2)*256 + _
                                    outparams.ResponseData(1) & " watts"
End If
' End Script
```

Command Line (Example)

```
C:\VBS> cscript //nologo Power.vbs
```

Execution Result (Example)

```
Completion Code = 0x0
Power Consumption = 528 watts
```

The power consumption is 528 watts.

> **NOTE:** Power consumption may not be collected depending on power
> supply configuration of the server. In such a case, Completion Code is
> shown as 0xC1 or 0xCB.

INLET AIR TEMPERATURE

Run the following IPMI commands to access the SDR (Sensor Data Record) and obtain an inlet air temperature data.

Get SDR Repository Info

Reserve SDR Repository

Get SDR

Get Sensor Reading

Shown below is an example of the file created by Visual Basic Script (e.g. Sensor.vbs).

```
'Start Script
Option Explicit

' Prepare for MS IPMI Driver
Dim osvc, oclass
Dim oinstance, oipmi
set osvc = getobject("winmgmts:root\wmi")
set oclass = osvc.get("microsoft_ipmi")
for each oinstance in osvc.instancesof("microsoft_ipmi")
            set oipmi = oinstance
next

' (Get SDR Repository Info)
Dim oinparams
set oinparams = oclass.methods_("requestresponse").inparameters
' (Get SDR Repository Info)
oinparams.networkfunction = &ha
oinparams.lun = 0
oinparams.responderaddress = &h20
oinparams.command = &h20
oinparams.requestdatasize = 0
' Fire IPMI Command
Dim outparams
Dim i, RecordCount
set outparams = oipmi.execmethod_("requestresponse",oinparams)
RecordCount = outparams.ResponseData(3)*256 + outparams.ResponseData(2)

' (Reserve SDR Repository)
oinparams.networkfunction = &ha
oinparams.lun = 0
oinparams.responderaddress = &h20
oinparams.command = &h22
oinparams.requestdatasize = 0
Dim Reserve_LS, Reserve_MS
set outparams = oipmi.execmethod_("requestresponse",oinparams)
Reserve_LS = outparams.ResponseData(1)
Reserve_MS = outparams.ResponseData(2)
```

```
' (Get SDR) for each record
Dim Record_LS,Record_MS, Offset, Length
Dim cnt, sensorNum, sensorType
' First Record
Record_LS = 0
Record_MS = 0
For cnt = 0 to RecordCount-1
    Offset = 0
    Length = 9
    oinparams.networkfunction = &ha
    oinparams.lun = 0
    oinparams.responderaddress = &h20
    oinparams.command = &h23
    oinparams.requestdata = array(Reserve_LS, Reserve_MS, Record_LS, Record_MS, Offset, Length)
    oinparams.requestdatasize = 6
    set outparams = oipmi.execmethod_("requestresponse",oinparams)
    If outparams.Completioncode = 0 Then
        If outparams.ResponseData(6) = 1 Then            ' Full Sensor Record
            call GetSensorType(Reserve_LS, Reserve_MS, Record_LS, Record_MS, sensorType)
            If sensorType = 1 Then                       ' Temperature
                WScript.Echo "==========================================="
                call GetIDString(Reserve_LS, Reserve_MS, Record_LS, Record_MS)
                WScript.Echo " Sensor Type = Temperature"
                sensorNum = outparams.ResponseData(10)
                call GetSensor(Reserve_LS, Reserve_MS, Record_LS, Record_MS,sensorNum)
            End If
        End If
        Record_LS = outparams.ResponseData(1)
        Record_MS = outparams.ResponseData(2)
        If Record_LS = &hff And Record_MS = &hff Then
            exit For
        End If
    End If
Next

Sub GetSensorType(rv_ls, rv_ms, rc_ls, rc_ms, sensorType)
    Dim outtmp
    oinparams.networkfunction = &ha
    oinparams.lun = 0
    oinparams.responderaddress = &h20
    oinparams.command = &h23
    oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 12, 2)
    oinparams.requestdatasize = 6
    set outtmp = oipmi.execmethod_("requestresponse",oinparams)
    sensorType = outtmp.ResponseData(3)
End Sub
```

```
Sub GetSensor(rv_ls, rv_ms, rc_ls, rc_ms, sensorNum)
    Dim outtmp, units1, units2, sensortype
    oinparams.networkfunction = &ha
    oinparams.lun = 0
    oinparams.responderaddress = &h20
    oinparams.command = &h23
    oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 20, 14)
    oinparams.requestdatasize = 6
    set outtmp = oipmi.execmethod_("requestresponse",oinparams)

    units1 = outtmp.ResponseData(3)
    Select Case outtmp.ResponseData(4)
        case 0: units2 = "unspecified"
        case 1: units2 = "degrees C"
        case 6: units2 = "Watts"
        case else: units2 = "Refer to IPMI Specification: Type=0x" _
                             & hex(outtmp.ResponseData(4))
    End Select

    ' (Get Sendor Reading)
    Dim sensorData, rawData, currentValue
    oinparams.networkfunction = &h4
    oinparams.lun = 0
    oinparams.responderaddress = &h20
    oinparams.command = &h2d
    oinparams.requestdata = array(sensorNum)
    oinparams.requestdatasize = 1
    set sensorData = oipmi.execmethod_("requestresponse",oinparams)
    If sensorData.Completioncode <> 0 Then
        'WScript.Echo " Sensor Not Available"
        exit Sub
    End If
    rawData = sensorData.ResponseData(1)
    If units1 and &h40 Then
        If rawData And &h80 Then
            rawData = rawData Xor &hff
        End If
    Elseif units1 and &h80 Then
        call get2complement(rawData, rawData, 8)
    End If
    If (sensorData.ResponseData(2) And &h80) = 0 Or _
       (sensorData.ResponseData(2) And &h40) = 0 Or _
       (sensorData.ResponseData(2) And &h20) Then
        WScript.Echo " Event Status: Unavailable"
    Else
        'WScript.Echo " Event Status: ok"
        Dim M,B,k1,k2
        Dim ret
        M = (outtmp.ResponseData(8) And &hc0) * 4 + outtmp.ResponseData(7)
        B = (outtmp.ResponseData(10) And &hc0) * 4 + outtmp.ResponseData(9)
        call get2complement(M, M, 10)
        call get2complement(B, B, 10)
        call get2complement(outtmp.ResponseData(12) And &h0f, k1, 4)
        call get2complement((outtmp.ResponseData(12) And &hf0)/16, k2, 4)
        currentValue = CDbl (((M * rawData) + (B * (10 ^ k1))) * (10 ^ k2))
        WScript.Echo " Current Value = " & currentValue & " " & units2
    End If
End Sub
```

```
Sub get2complement(raw, rv, bit)
    Select Case bit
        case 4:
            If raw And &h8 Then
                rv = 0 - ((&h10 - raw) and &h0f)
            Else
                rv = raw
            End If
        case 8:
            If raw And &h80 Then
                rv = 0 - ((&h100 - raw) and &h0ff)
            Else
                rv = raw
            End If
        case 10:
            If raw And &h200 Then
                rv = 0 - ((&h400 - raw) and &h3ff)
            Else
                rv = raw
            End If
    End Select
End Sub

Sub GetIDString(rv_ls, rv_ms, rc_ls, rc_ms)
    Dim tmpMessage
    Dim outsdridstringtype
    oinparams.networkfunction = &ha
    oinparams.lun = 0
    oinparams.responderaddress = &h20
    oinparams.command = &h23
    oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 47, 1)
    oinparams.requestdatasize = 6
    set outsdridstringtype = oipmi.execmethod_("requestresponse",oinparams)

    Dim outsdridstring
    Dim idlength, j
    idlength = outsdridstringtype.ResponseData(3) and 31
    oinparams.networkfunction = &ha
    oinparams.lun = 0
    oinparams.responderaddress = &h20
    oinparams.command = &h23
    oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 48, idlength)
    oinparams.requestdatasize = 6
    set outsdridstring = oipmi.execmethod_("requestresponse",oinparams)
    tmpMessage = " ID String = "
    For j = 3 to idlength + 2
        tmpMessage = tmpMessage & Chr(outsdridstring.ResponseData(j))
    Next
    WScript.Echo tmpMessage
End Sub
'End Script
```

Command Line (Example)

```
C:\VBS> cscript //nologo Sensor.vbs
```

Execution Result (Example)

```
==========================================
 ID String = Front Panel Temp
 Sensor Type = Temperature
 Current Value = 27 degrees C
==========================================
 ID String = Baseboard Temp1
 Sensor Type = Temperature
 Current Value = 50 degrees C
==========================================
 ID String = Baseboard Temp2
 Sensor Type = Temperature
 Current Value = 53 degrees C
==========================================
 ID String = IO Riser Temp
 Sensor Type = Temperature
 Current Value = 43 degrees C
==========================================
 ID String = M1 DIMM 1A Temp
 Sensor Type = Temperature
 Current Value = 37 degrees C
==========================================
     :
     :
```

Inlet air temperature data is obtained from the sensor that contains the character string "Amb", "Ambient", or "Front Panel" in its ID String.

In the example above, the data is obtained from "Front Panel Temp" sensor, and the sensor reading is 27ºC.

PROCESSOR UTILIZATION

To collect the utilization of processors, use Win32_PerfFormattedData_PerfOS_Processor class provided with the Windows OS.

Shown below is a sample file created by Visual Basic Script (e.g. Proc.vbs).

In this script, the processor utilization is collected every 30 seconds.

```
' Start Script
strComputer = "."
Set objWMIService = GetObject("winmgmts:" _
    & "{impersonationLevel=impersonate}!\\" & strComputer & "\root\cimv2")
set objRefresher = CreateObject("WbemScripting.Swbemrefresher")
Set objProcessor = objRefresher.AddEnum _
    (objWMIService, "Win32_PerfFormattedData_PerfOS_Processor").objectSet
objRefresher.Refresh
Dim first
first = true
Do
  For each intProcessorUse in objProcessor
    If first Then
      If intProcessorUse.Name = "_Total" Then
        first = false
      End If
    else
      Wscript.Echo "Proc" & intProcessorUse.Name & " : " & _
                   "PercentProcessorTime=" & _
                   intProcessorUse.PercentProcessorTime
    End If
  Next
  Wscript.Sleep 30*1000    'sleep 30 * 1000ms
  objRefresher.Refresh
Loop
' End Script
```

Command Line (Example)

```
C:\VBS> cscript //nologo Proc.vbs
```

Execution Result (Example)

```
Proc0 : PercentProcessorTime=9
Proc1 : PercentProcessorTime=0
Proc2 : PercentProcessorTime=0
Proc3 : PercentProcessorTime=0
Proc4 : PercentProcessorTime=0
Proc5 : PercentProcessorTime=1
Proc6 : PercentProcessorTime=6
Proc7 : PercentProcessorTime=41
Proc8 : PercentProcessorTime=0
Proc9 : PercentProcessorTime=0
Proc10 : PercentProcessorTime=0
Proc11 : PercentProcessorTime=0
Proc12 : PercentProcessorTime=0
Proc13 : PercentProcessorTime=7
Proc14 : PercentProcessorTime=20
Proc15 : PercentProcessorTime=63
   :
   :
Proc_Total : PercentProcessorTime=8
```

Proc0 to Proc64 represents utilization of individual processor, and Proc_Total represents utilization of overall processors.

> **NOTE:** The processor number indicates a logical CPU number, not a physical CPU number. The maximum processor number depends on processor type and how they are configured.

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Appendix J

Product Configuration Record Table

Use this table for information about setup and system environment change.

Hardware

Main Unit						
	Model name		Serial No.		Date Installed	
CPU						
#1	Clock		Serial No.		Date Installed	
#2	Clock		Serial No.		Date Installed	
Memory						
CPU1-DIMM1	Size		Serial No.		Date Installed	
CPU1-DIMM2	Size		Serial No.		Date Installed	
CPU1-DIMM3	Size		Serial No.		Date Installed	
CPU1-DIMM4	Size		Serial No.		Date Installed	
CPU1-DIMM5	Size		Serial No.		Date Installed	
CPU1-DIMM6	Size		Serial No.		Date Installed	
CPU2-DIMM1	Size		Serial No.		Date Installed	
CPU2-DIMM2	Size		Serial No.		Date Installed	
CPU2-DIMM3	Size		Serial No.		Date Installed	
CPU2-DIMM4	Size		Serial No.		Date Installed	
CPU2-DIMM5	Size		Serial No.		Date Installed	
CPU2-DIMM6	Size		Serial No.		Date Installed	
Hard Disk Drive						
#1	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
#2	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
#3	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
#4	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
#5	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
#6	Type			Serial No.		
	Capacity			Date Installed		
	Type number					

Monitor						
	Type		Model name		Serial No.	
					Date Installed	
Backup Device						
Slot 1	Size		Capacity		Serial No.	
	Model name		Type number		Date Installed	
PCI Slot #1B						
	Model name				Serial No.	
					Date Installed	
PCI Slot #1C						
	Model name				Serial No.	
					Date Installed	
Printer						
	Model name				Serial No.	
	Manufacturer				Date Installed	
Additional Cabinet for Disk						
	Model name				Serial No.	
					Date Installed	
External Peripheral Device 1						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 2						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 3						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 4						
	Model name				Serial No.	
	Manufacturer				Date Installed	

Software

Firmware version	
OS Application of RUR media	Name: Version: ☐ Apply Name: Version:
File system	☐ FAT ☐ HPFS ☐ NTFS ☐ Others ( )
Bundled software installed	
Licensed software installed	
Application running when a failure occurred	

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