NEC

N8100-1078F/1079F
NEC Express5800/120Eg
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**

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

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

Prohibited Actions

🚫	Indicates a general prohibited action that cannot be specifically identified.
🚫	Do not disassemble, repair, or modify the server. Otherwise, an electric shock or fire may be caused.

Mandatory Action

	Unplug the power cord of the server. 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 domestic environment this product may cause radio interference in which case the user may be required to take adequate 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。

Trademarks

NEC DianaScope, NEC ESMPRO and NEC EXPRESSBUILDER are trademarks of NEC Corporation.
Microsoft, Windows, Windows Server, Windows NT, and MS-DOS are registered trademarks or trademarks of Microsoft Corporation in the United States and other countries.
Intel and Pentium are registered trademarks of Intel Corporation.
Datalight is a registered trademark of Datalight, Inc.
ROM-DOS is a trademark of Datalight, Inc.
LSI-Logic, MegaRAID, and Power Console Plus are registered trademarks or trademarks of LSI Logic Corp.
Novell and NetWare are registered trademarks of Novell, Inc. of the United States.
AT is a registered trademark of International Business Machines Corporation in the United States and other countries.
Adaptec and its logo is a registered trademark of Adaptec, Inc. of United States.
SCSI*Select* is a trademark of Adaptec, Inc. of the United States.
Adobe, Adobe logo, and Acrobat are trademarks of Adobe Systems Incorporated.
DLT and DLTtape are trademarks of Quantum Corporation of the United States.
Promise Technology, Inc. is a registered trademark of Promise Technology, Inc. of the U.S.A.
All other product, brand, or trade names used in this publication are the trademarks or registered trademarks of their respective trademark owners.

Windows XP stands for Microsoft® Windows® XP Professional operating system and Microsoft® Windows® XP Home Edition operating system. Windows 2000 stands for Microsoft® Windows® 2000 Server operating system and Microsoft® Windows® 2000 Advanced Server operating system, and Microsoft® Windows® 2000 Professional operating system. Windows 2003 stands for Microsoft® Windows Server™ 2003 operating system and Microsoft® Windows Server™ 2003 Standard Edition and Enterprise Edition. Windows Me stands for Microsoft® Windows® Millennium Edition operating system. Windows 98 stands for Microsoft® Windows®98 operating system.   Windows 95 stands for Microsoft® Windows®95 operating system.

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.

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 manual may be revised without prior notice.
(3) The contents of this manual 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 manual.   If you notice any part unclear, incorrect, or omitted in this manual, 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 manual 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.

PREFACE

Congratulations on the purchase of your 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 floppy disk and CD-ROM drives.

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. This chapter also provides information on mother board jumper settings and the onboard RAID configuration utility.

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 CD-ROM "NEC EXPRESSBUILDER".

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 two onboard SATA controller, the optional RAID controller, and the power supply.

Appendix A   Specification
provides specifications for your server.

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

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

Appendix D   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 E   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 F   Installing Windows 2000
describes how to install Microsoft Windows 2000 without using Express Setup.   Using the Express Setup tool is recommended for installing Windows 2000.   See Chapter 5 for details.

Appendix G   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 sales agent.

- 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 floppy disk or CD-ROM may alter your system environment.   If you find anything unclear, immediately ask your sales agent for help.

CONTENTS

(This page is intentionally left blank.)

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.
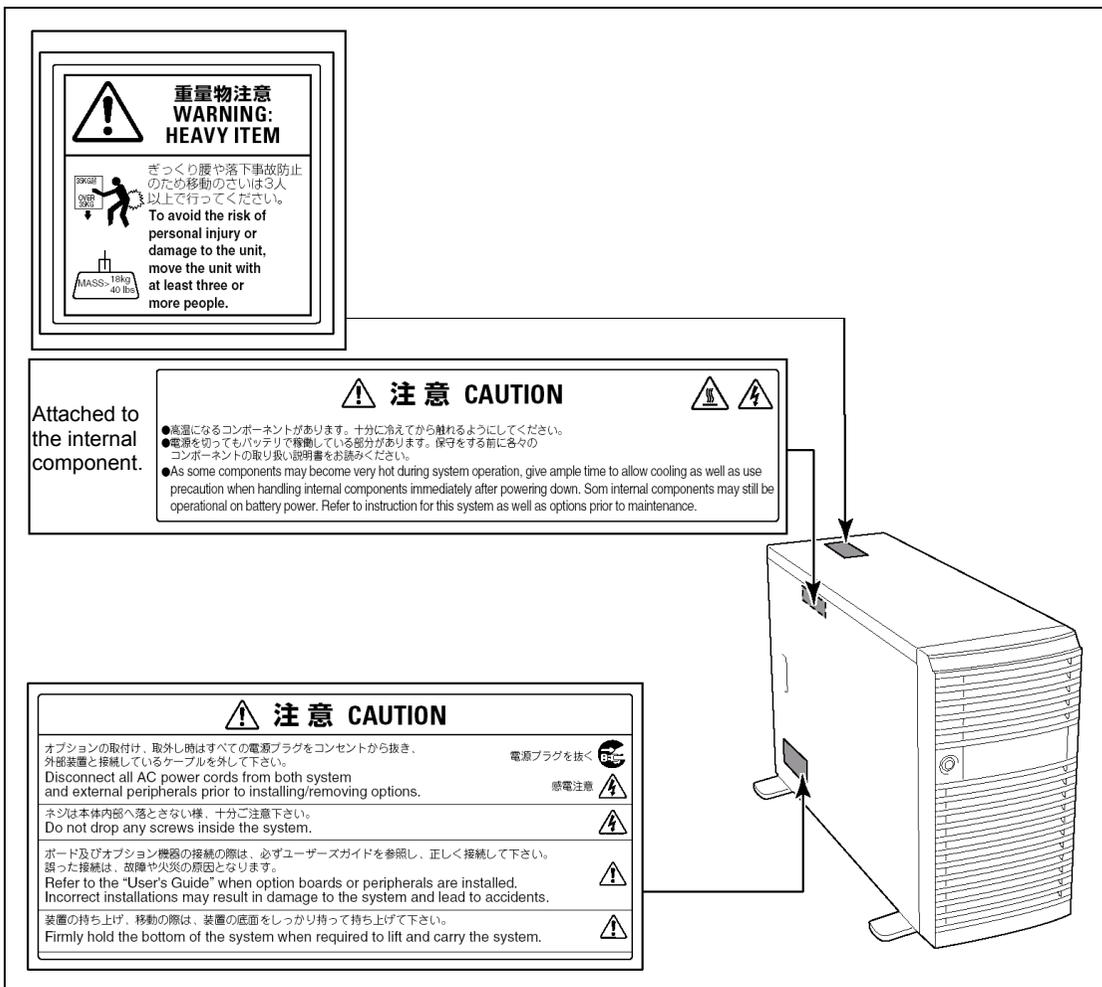
SAFETY NOTES

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

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 POWER switch and disconnect the power plug from the outlet, then contact your sales agent. 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 floppy disk or CD-ROM drive. Doing so may cause an electric shock.

⚠ 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 sales agent.

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.

⚠ 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 your 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 sales agent for replacement.)

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

⚠ CAUTION

Never attempt to lift the server only by yourself.

Your server weighs max. 33 kg (depending on its hardware configuration). Carrying the server only by yourself may strain your back.   Hold the server firmly by its bottom with at least three or more people.   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 manual.   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 use or store the server in corrosive environment.

Avoid the usage or storage of your server in an environment which may be exposed to corrosive gases, such as those including but not limited to: sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia and/or ozone.
Avoid installing your server in a dusty environment or one that may be exposed to corrosive materials such as sodium chloride and/or sulfur.
Avoid installing your server in an environment which may have excessive metal flakes or conductive particles in the air.
Such environments may cause corrosion or short circuits within your server, resulting in not only damage to your server, but may even lead to be a fire hazard.
If there are any concerns regarding the environment at the planned site of installation or storage, please contact your sales representative.

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 manual.   Failure to follow this instruction may cause an electric shock or fire as well as malfunctions of the server.

Do not look into the CD-ROM drive.

A laser beam used in the CD-ROM drive is harmful to the eyes.   Do not look into or insert a mirror into the drive while the drive is powered.   If a laser beam is caught in your eyes, you may lose your eyesight (the laser beam is invisible).

Do not remove the lithium battery.

Your 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 sales agent.   Do not disassemble the server to replace or recharge the battery by yourself.

Disconnect the power plug before accessing inside the server, or connecting the peripherals.

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 disks 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.

Protect the unused connectors with the protective cap.

The unused power supply cable connectors are covered with the protective cap to prevent short circuits and electrical hazards. When removing the power supply cable connector from the internal devices, attach the protective cap to the connector. Failure to follow this warning may cause a fire or an electric shock.

During Operation

⚠ **CAUTION**

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 use a cellular phone or pager around the server.

Turn off the cellular phone or pager.   Radio interference may cause malfunctions of the server.

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 server in a place that meets requirements for successful operation.   For details, see Chapter 3, "Setting Up Your Server."

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

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

- When plugging the power cord to the system, you may experience 10 seconds delay from the time you press the POWER switch on the front panel.   This is normal system operation.

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

- Do not turn off the server until characters appear on the screen.

- For the disk which does not conform to the CD standard, the playback of such a disk with the CD drive is not guaranteed.

- 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 sales agent to ask maintenance.

- Store the unit under the storage condition (temperature: –10°C - 55°C, humidity: 20% - 80%, without condensation) to allow built-in devices and the unit to operate correctly in the next operation.

- Make sure to use optional devices supported by the server.   Some non-supported devices may be physically installed/connected but cause failures of the server as well as malfunctions of the server.

- NEC recommends you use NEC's genuine products.   Some third-party products claim that they support the server.   However, repair of the server due to a failure or damage resulted from use of such third-party products will be charged.

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:** It is the user's responsibility to completely erase or modify all the data stored in storage device such as hard disk so that the data cannot be restored.

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 the server, all the internal devices, floppy disks, and CD-ROMs according to all national laws and regulations.

IMPORTANT:

- For disposal (or replacement) of the battery on the mother board of the server, consult with your sales agent. In addition, dispose of the provided power cord along with the server to prevent the diversion to other devices.

- It is the user's responsibility to completely erase or modify all the data stored in storage device such as hard disk so that the data cannot be restored.

- Your server contains some components that are only good for a limited period of time and require replacement, such as fans, internal batteries, the internal CD-ROM 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 sales agent for replacement or the product lives.

⚠ WARNING

Do not remove the lithium battery.

Your contains the lithium battery.   Do not remove the battery.   Placing the lithium or nickel cadmium battery 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 sales agent.   Do not disassemble the server to replace or recharge the battery by yourself.
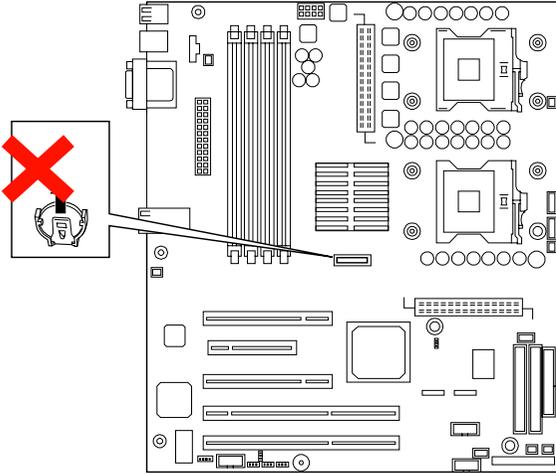
Mother board

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 sales agent 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 sale agent.

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.
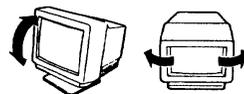
Adjustment of Screen Brightness and Contrast
The display unit has brightness and contrast adjustment functions.   The most suitable brightness and contrast depend on the individual and the working environment (well-lighted room or insufficient light).   Adjust brightness and contrast so that the screen will be easy to see.   An extremely bright or dark screen will give a bad effect to your eyes.
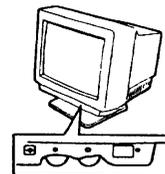
Adjustment of Keyboard Angle
The keyboard provided with the server is designed for adjustment of an angle.   Adjust the keyboard angle at which the keyboard is easy to operate.   The adjustment assists in reducing strain on your shoulders, arms, and fingers.
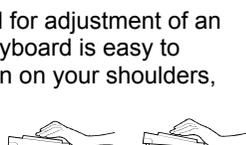
Cleaning of Equipment
Clean equipment regularly.   It is difficult to see the display contents on a dusty screen.   Keeping equipment clean is also important for your sight.

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 family. 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 a file and print services, e-mail, web access, web site server, etc.

This server is conveniently housed and available as a tower-based system or as a rack-mount system (fits into a standard EIA 19-inch rack assembly).
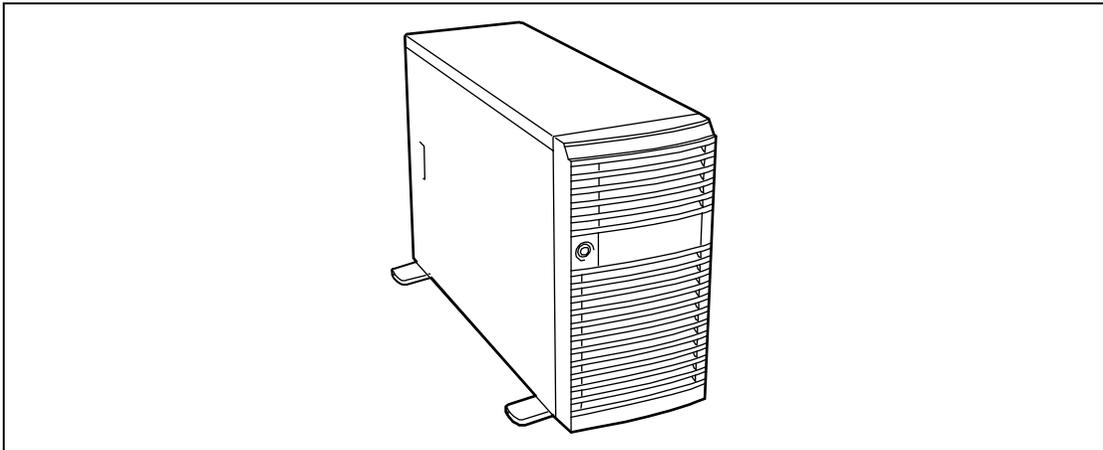
Tower-based System Front View

As application requirements increase, you can expand your server with an additional processor, additional memory, add-in boards and peripheral devices; tape devices, CD-ROM, and hard disk drives.

The server features the following major components.

- A high-performance Intel Pentium Xeon processor (up to two processors)
- A high-performance synchronous system bus to interconnect the CPU and memory subsystems with a bridge to expansion bus I/O.
- On-board enhanced SATA interface controller
- Five integrated I/O expansion PCI slots
- Up to 8GB of ECC memory (using 2GB DIMMs). Minimum configuration is 512MB of memory
- Integrated CD-ROM and 1.44MB diskette
- Four hard disk expansion bays
- Four removable media expansion bays
- High degree of hard disk drive fault tolerance and advanced disk array management features through the use of onboard HostRAID™ Technology or the optional RAID controller.

SYSTEM CHASSIS

Names and functions of the components are shown below.

Front View
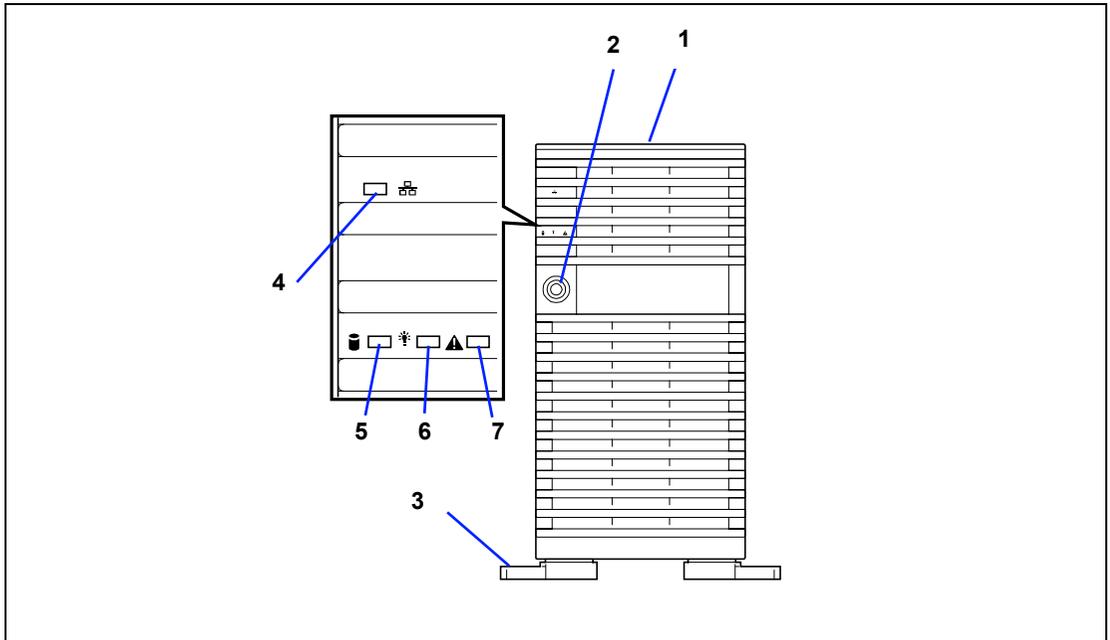
1 Front door
   Open this door to access the POWER switch, 5.25-inch devices, the CD-ROM drive, or the
   floppy disk drive, or to install/remove hard disks to 3.5-inch bays.   You can lock the front door
   using the provided security key.

2 Key hole
   Insert the security key to lock/unlock the front door.

3 Stabilizers (4)
   Use the stabilizers to prevent the server from falling down.

4 LAN ACCESS lamp (green)
   Lights in green while the server is connected to the network.   Blinking in green indicates the
   network activity.

5 DISK ACCESS lamp (green)
   Lights in green while the internal hard disk is in access.

6 POWER/SLEEP lamp (green)
   Lights in green when the server is powered on.   When the server is powered off.   Blinks
   when the system is placed in the sleep mode.

7 STATUS lamp (green/amber)
   Lights in green while the server is in successful operation.   When any error is detected, this
   lamp lights in amber.

Front View (Door Opened)

CD-ROM Drive

Floppy Disk Drive
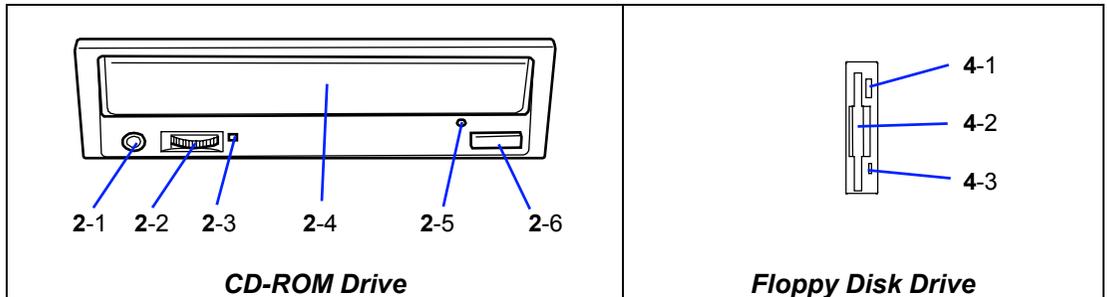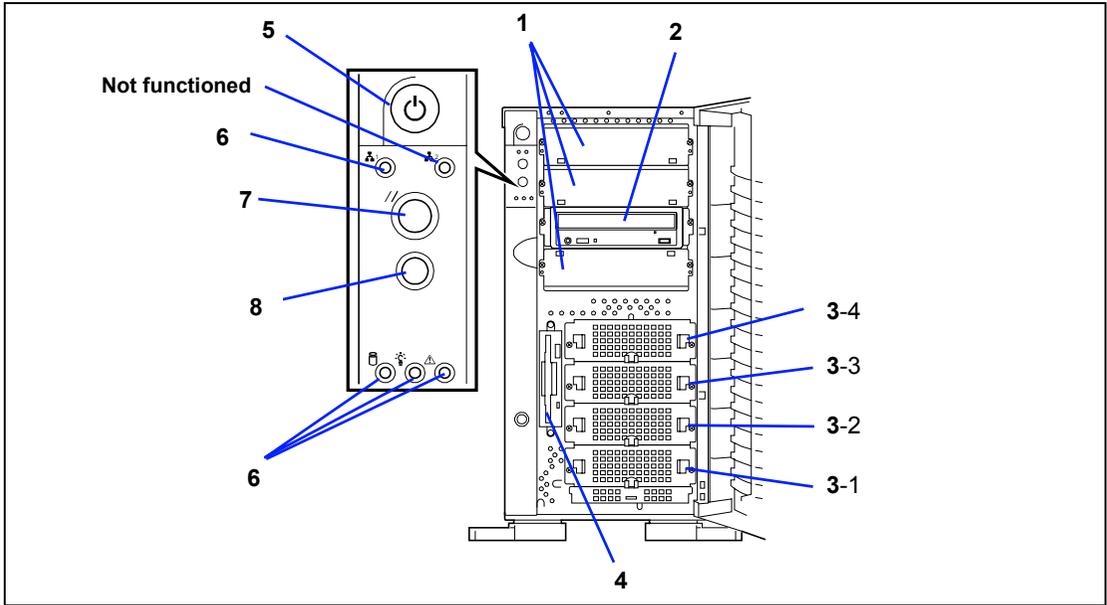
1   **5.25-inch device bay (4)**
Backup file device may be installed in the 5.25-inch device bay.
The server can include a maximum of two devices.

2   **CD-ROM drive**
The CD-ROM drive reads data from the inserted CD-ROM.
2-1   Headphone jack
2-2   Volume control
2-3   Access lamp (lights in amber while being accessed)
2-4   CD-ROM slot
2-5   Emergency hole
2-6   Open/Close button

3   **Hard disk drive bay**
The hard disk drive bay contains up to four hard disk drives.   Hard disk drives are installed from the bottom to top of the hard disk drive bay.

4   **3.5-inch floppy disk drive**
Insert a 3.5-inch floppy disk to the 3.5-inch floppy disk drive to read data from the disk or write data to the disk.
4-1: Eject button
4-2: Disk inserting section
4-3: Floppy disk access lamp (lit green during accessing)

5   **Power switch**
The power switch is used to turn on/off the power.   If you press the switch once, then the POWER/SLEEP lamp goes on and the power is turned on.   If you press the switch again, the power is turned off.   The system is forcibly shut down when the power switch is pressed continuously for four seconds or longer.

6   **Lamps** (see the figure on the previous page)

7   **Reset switch**
The reset switch is used to reset the server.

8   **Dump switch (NMI switch)**
Non-maskable Interrupt switch.
The dump switch is used to collect the event logs having occurred in the server.

Rear View
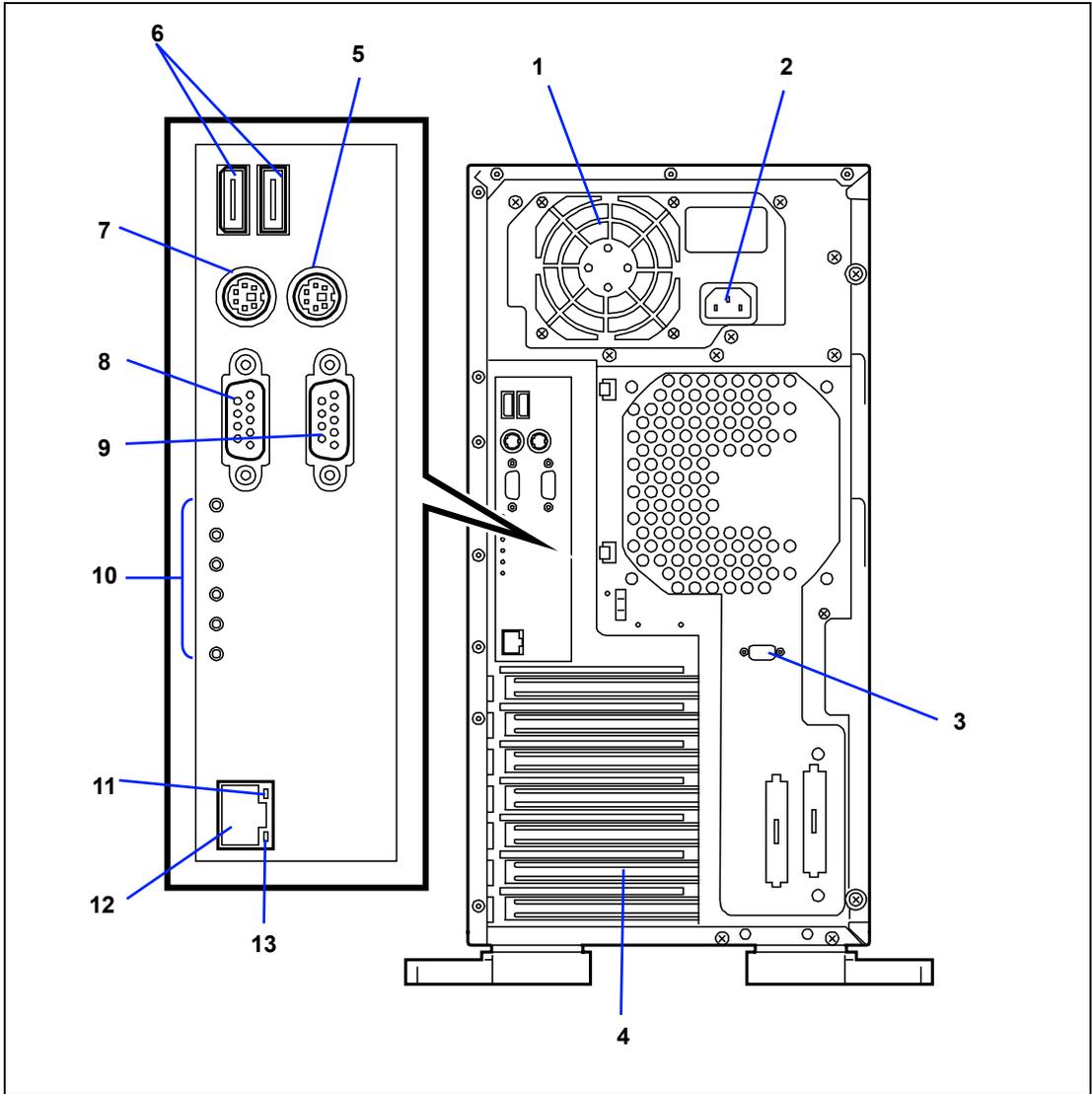
1   **Power supply**
          The power unit supplies DC powers to the server.

2   **AC inlet**
          The AC inlet is connected with the power cord.

3   **Serial port B connector**
          The serial port B connector is used to connect the server to a device with the serial interface.
          The server cannot be directly connected to a leased line through the connector.

4   **Additional PCI board slots**
          Optional PCI boards may be inserted into the slots.

5   **Mouse connector**
          The mouse connector is connected with the mouse coming with the server.

6   **USB-1 (left) / USB-2 (right) connectors**
          The USB-1 and USB-2 connectors are connected with devices accepting the USB interface.

7   **Keyboard connector**
          The keyboard connector is connected with keyboard coming with the server.

8   **Monitor connector**
          The monitor connector is connected with the display unit.

9   **Serial port A connector**
          The serial port A connector is connected with a device having the serial interface.

10   **Maintenance LEDs**
11   **Link/ACT lamp**
          The Link/ACT lamp shows the LAN access status.

12   **LAN connector**
          The LAN connector is connected with a network system on LAN (1000BASE-T/100BASE-
          TX/10BASE-T).

13   **1000/100/10 lamp**
          1000/100/10 lamp indicates the LAN transfer rate.

Internal View
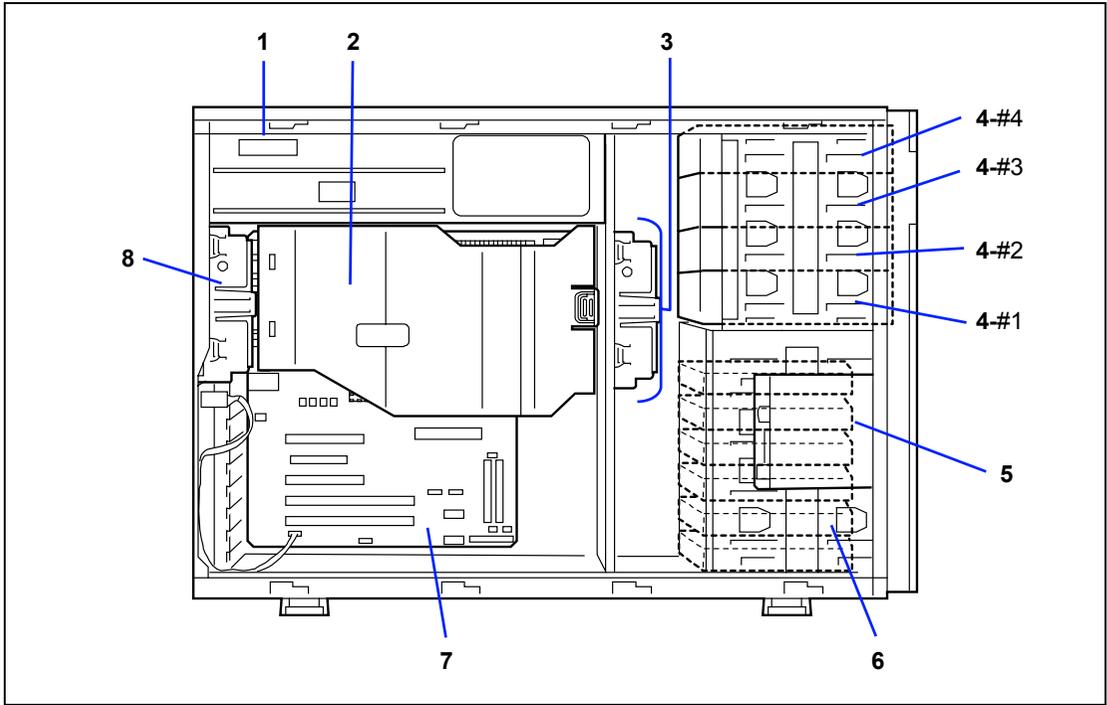
1   **Power supply**

2   **Processor air duct**

3   **Front cooling fan**

4   **5.25-inch device bays** (four slots)

A standard CD-ROM drive is installed in slot #2. The device bay can include a maximum of two single-height device and one double-height device.

5   **3.5-inch floppy disk drive**

6   **Hard disk drive bay**
Hard disk drive bay can be equipped with four hard disk drives.

7   **Mother board**

8   **Rear cooling fan**

MOTHER BOARD
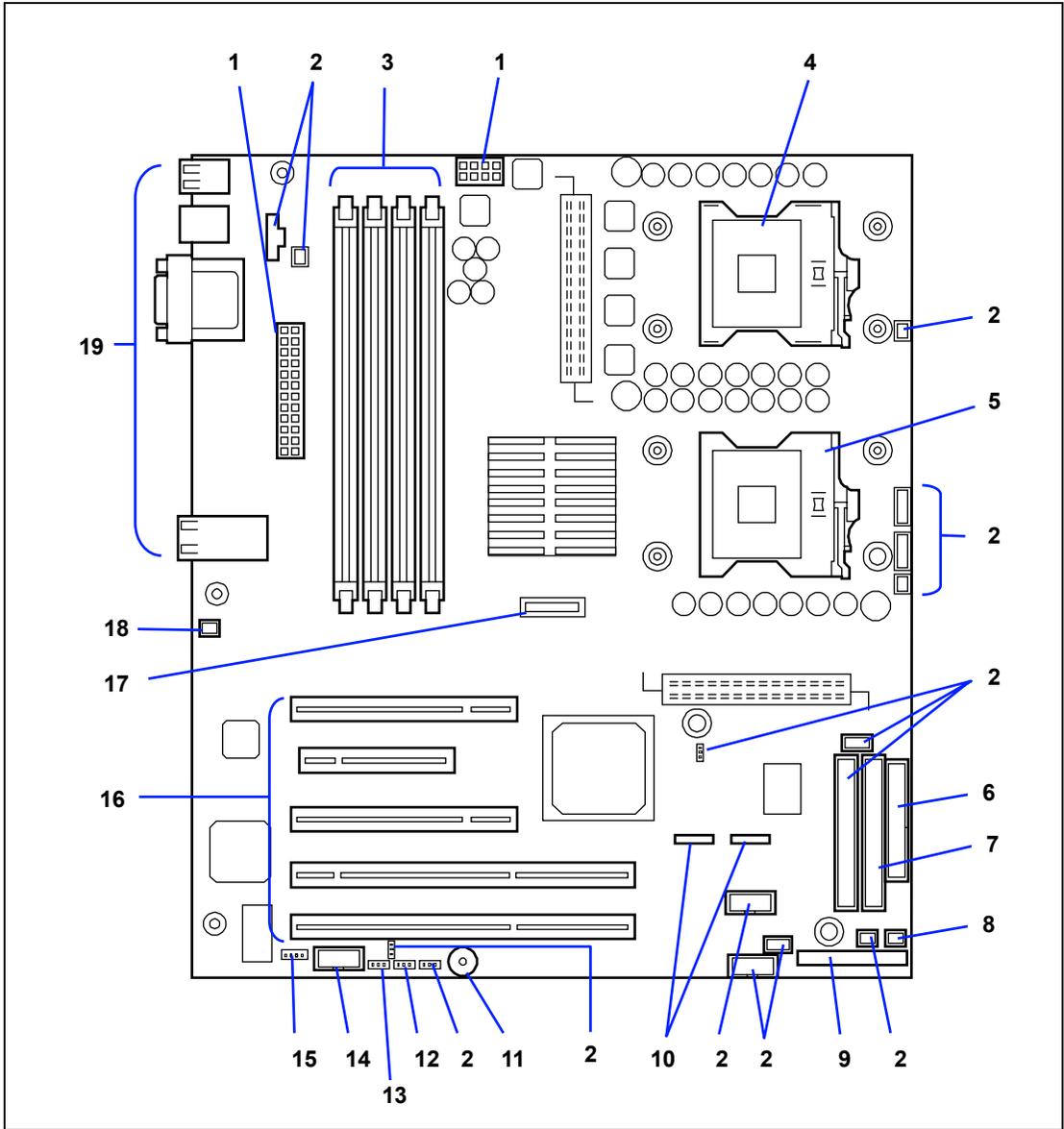
1   Power connector

2   Not used in this system

3   DIMM sockets (sockets #1B, #1A, #2B, and #2A arranged from left to right)

4   CPU1 socket

5   CPU2 socket

6   Floppy disk drive connector

7   Ultra ATA66 connector (for CD-ROM drive)

8   Front cooling fan connector

9   Front panel interface connector

10   Serial ATA connectors (for built-in hard disk drives)

11   Speaker

12   Configuration jumper switch (password)

13   Configuration jumper switch (CMOS)

14   Serial (COM B) connector

15   LED connector

16   PCI board slots
(slots PCI #1, PCI #2, PCI #3, PCI #4, and PCI #5 arranged from bottom to top)
PCI #5:   32-bit/33MHz PCI
PCI #4:   PCI EXPRESS
PCI #3:   32-bit/33MHz PCI
PCI #2 and #1: 64-bit/66MHz PCI-X

17   Lithium battery

18   Rear cooling fan connector

19   External connection connector

STANDARD FEATURES

High performance

- Intel® Xeon™ Processor
- DDR333 integrated SDRAM
- High-speed 1000BASE-T/100BASE-TX/ 10BASE-T interface (1000Mbps/100Mbps/10Mbps supported)
- High-speed disk access (Two serial ATA channels)
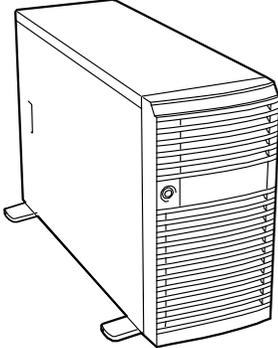
Expandability

- Wide variety of optional I/O slots Two 64-bit, 66MHz PCI-X slots Two 32-bit, 33MHz PCI slot One PCI EXPRESS Slot
- Large memory of up to 4 GB
- Four hard disk drive bays
- Remote power-on feature
- Up to two Intel Xeon processors
- USB interface (A USB-support driver is required.)
- Convert to rack-mount type (N8143-56F Rack Conversion Kit is required.)

High-reliability

- Memory monitoring feature (single-bit error correction/double-bit error detection)
- CPU/memory degradation feature (logical isolation of a failed device)
- Temperature detection
- Error notification
- Internal fan monitoring feature
- Internal voltage monitoring feature
- BIOS password feature
- Security feature (security lock)
- Disk array (option)
- Hot Swap SATA/SCSI HDD (optional)

Management Utilities

- NEC ESMPRO

Power Saving Feature

- Sleep feature (available for Windows 20003/2000)

Many Available Features

- Graphic accelerator "RAGE XL" support
- El Torito Bootable CD-ROM (no emulation mode) format support
- POWER switch mask
- Software power-off
- Remote power-on feature
- AC-LINK feature

Self-diagnosis

- Power On Self-Test (POST)
- Test and Diagnosis

Maintenance Features

- Memory dump feature using the DUMP (NMI) switch

Easy and Fine Setup

- NEC EXPRESSBUILDER (system setup utility)
- Onboard SATA RAID configuration utility
- SETUP (BIOS setup utility)
- Configuration Diskette Creator

Power Supply

The system contains one auto-sensing 625-watt power supply at an operating frequency of 50/60 Hz.

The power supply is designed to comply with existing emission standards and provide sufficient power for a fully loaded system configuration.

Peripheral Bays

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

- A 3.5-inch front panel bay for installing the standard 3.5-inch floppy disk drive (supports 720KB and 1.44MB floppy disk media)

- Four 5.25-inch device bays for installing half-height or full-height 5.25-inch peripheral devices such as an optional tape drives.

- The hard disk drive bays for installing up to four hard disk drives.

Degradation Feature

The degradation feature automatically isolates a failed DIMM or processor to assure continuous operation of the server when the POST (Power On Self-Test, self-diagnosis program after power on) detects such a DIMM or processor.

Failed DIMMs and processors may be identified on the screen that the POST displays, or with the BIOS SETUP utility.   They may also be identified on the system that has the NEC ESMPRO installed.

Remote Power-On Feature (Wake On LAN)

The remote power-on function turns on the server through a network.   It sends a special packet from the management computer to a remote server to turn it on if the server is off-powered.

To enable this feature, you must select "Enabled" for each submenu in the Advanced Chipset Control of the Advanced menu of the BIOS SETUP utility.   (See Chapter 4.)

The remote power-on feature is not available in the following cases.   Press the POWER switch once to start the OS, and turn off the server in an appropriate procedure.

- Abnormal previous system shut-down
- No power supply to the server (due to turned-off breaker, disconnected power cord, power blackout, etc.)

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 the Server menu of the BIOS SETUP utility.   (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:

- Enable the keyboard lockout timer so that the server requires a password to reactivate the keyboard and mouse after a specified time-out period – 2 to 120 minutes.
- Set and enable an administrative password.
- Set and enable a user password
- Set secure mode to prevent keyboard or mouse input and to prevent use of the front panel reset and power switches.
- Activate a hot-key combination to enter secure mode quickly.
- Disable writing to the floppy disk drive when secure mode is set.

NEC EXPRESSBUILDER

The CD-ROM that comes with your server contains a setup utility called "NEC EXPRESSBUILDER."   When you have first installed the server or append features to the server, use the NEC EXPRESSBUILDER to set up your server.

Refer to Chapter 6 for details.

The major functions of the NEC EXPRESSBUILDER are:

- To install the OS.
  It installs an operating system.

- To diagnose the system.
  It diagnoses the server.

- To create a support disk.
  It copies utilities in the NEC EXPRESSBUILDER CD-ROM into a floppy disk to launch them from the floppy disk.

- To update the BIOS
  It updates the BIOS features of the server.

- To update the Windows System*
  It updates the several resources of Microsoft Windows Server 2003, Microsoft Windows 2000.

- To install the utilities*
  It install the management utilities of NEC ESMPRO.

- To read the online documents*
  It opens the online document files (".pdf" files).

  * These functions are available under Windows system.

NEC ESMPRO

The NEC ESMPRO is server management software that runs on the OS.   The NEC ESMPRO includes the NEC ESMPRO Manager for the server monitoring terminal and the NEC ESMPRO Agent for the NEC Express 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 sales agent for details.

Off-line Maintenance Utility

The Off-line Maintenance Utility is used for proactive maintenance and fault analysis of the server. Normally this utility is used by the maintenance engineer.

Refer to Chapter 8 for details.

System Diagnostic Utility

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

USING NEC EXPRESS SERVER

This section describes basic operations of your server including how to use devices such as the floppy disk drive and the CD-ROM drive.   See Appendix B for notes on using the floppy disk, CD-ROM, and accessories including the keyboard and the mouse.

Front Door

Open the front door to power on/off the server, to access the floppy disk drive, CD-ROM drive, and 5.25-inch devices, and to install/remove hard disks to the 3.5-inch device bays.
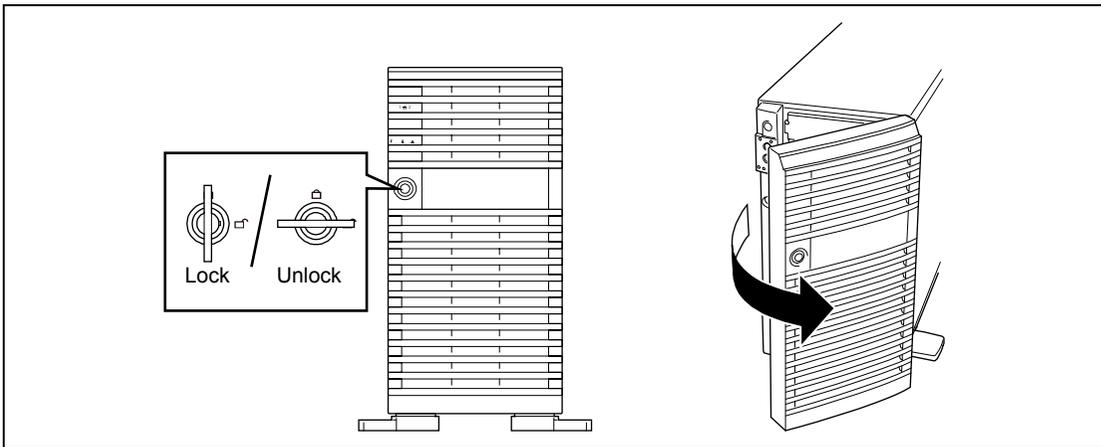
IMPORTANT: To open the front door, you must unlock the door with the provided security key.

Insert the provided security key into the key hole and turn the key to unlock the front door.   Then, hold the front door edges and gently pull the door away from the computer chassis.   When you close the front door, lock the door with the key for security.

IMPORTANT: Do not open the front door by hanging the handle at the upper left corner with your claws.   If the front door cannot be opened easily, hold the upper left and lower left corners of the front door with your hands and then pull it out toward you.

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/SLEEP lamp lights in green.

POWER/SLEEP lamp
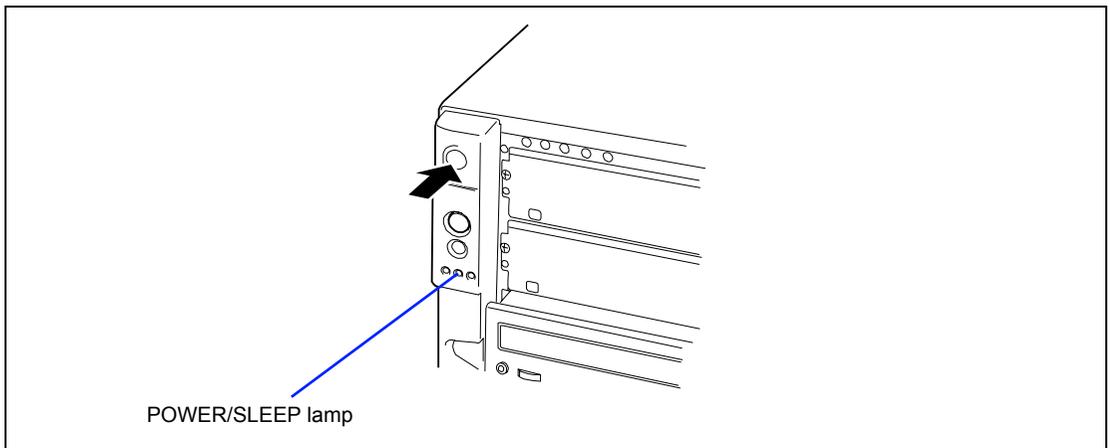
IMPORTANT:

■ If the power cord is connected to a power control device such as a UPS (Uninterruptible 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 10 seconds, then press the POWER switch.

■ Always allow POST to complete before powering down your system (see the next subsection for POST).

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 don't always need to check the POST check results.   Check messages that POST displays when:

- you use the NEC Express server for the first time.
- the server appears to fail.
- the server beeps for 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 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 NEC Express 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, SETUP, 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 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 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.

Press **F12** to start the operating system from the network drive.

4. If your server uses onboard serial ATA (SATA) RAID feature, the following message is displayed on the screen to prompt you to run Array Configuration Utility (ARC).

> Press <Ctrl><A> for Adaptec RAID Configuration Utility

Press **Ctrl** + **A** to run ARC. For detail explanation, refer to Chapter 4.

5. If the server has an optional RAID controller or SCSI card, POST displays the message prompting you to launch the RAID configuration utility and the disk array BIOS setup utility.

Refer to the manual supplied with the disk array controller for detail instructions.

POST will automatically proceed a few seconds later.

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.   See Chapter 8 for POST error codes.

> **IMPORTANT:** Take a note on the messages displayed before consulting with your sales agent.   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 off.

3. Power off peripheral devices.

SLEEP Switch

You can use the POWER switch as the SLEEP switch if the ACPI compliant operating system is installed in your system.

The SLEEP switch allows you to save almost all power of the server (power-saving mode or sleep mode).
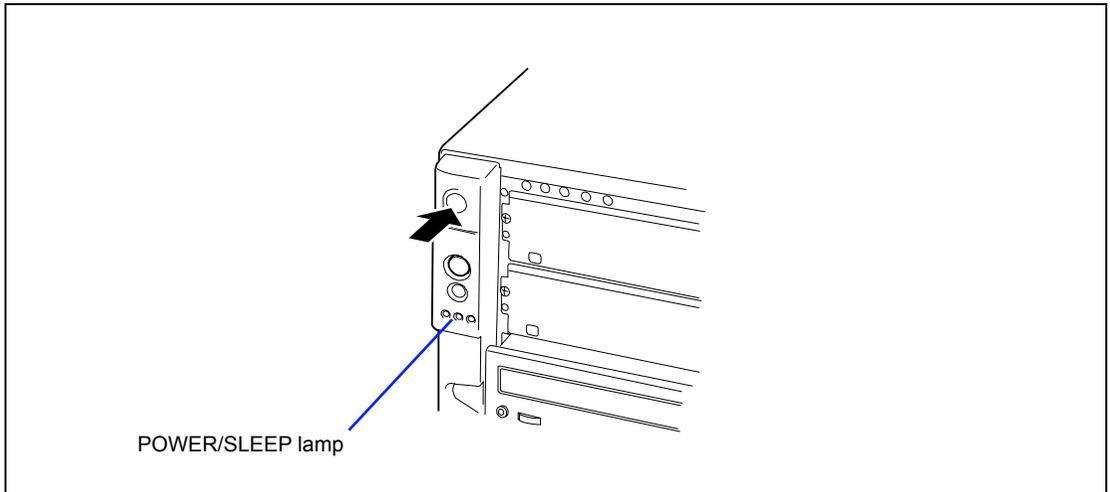
POWER/SLEEP lamp

Press the SLEEP switch on the front of the server to place the server in the power-saving mode. (The POWER/SLEEP lamp blinks.)   In the power-saving mode, the server retains the memory data and the status of the previous operations.

To resume the original state, press the SLEEP switch again.   (It may take a little time to resume the original state.)

> **NOTE:** The operational level in the power-saving mode depends on the OS in use.   (Available for the Windows operating system.)

> **IMPORTANT:** Do not change system configuration while turning into the power-saving mode or in the power-saving mode.   Otherwise, you may fail to resume the original state.

Floppy Disk Drive

Your server is provided with the 3.5-inch floppy disk drive on its front to write/read data to/from a floppy disk.

Your server supports the following 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)
  Store data of 720KB.

Make sure that the server is powered (the POWER/SLEEP lamp is lit) before inserting a floppy disk into the floppy disk drive.

When you completely insert the floppy disk into the floppy disk drive, the drive clicks and the eject button on the floppy disk is slightly pushed out.

> **NOTES:**
>
> - You cannot use a 1.2MB-formatted floppy disk to boot the system.
>
> - When an unformatted floppy disk is inserted, the message notifying that date read is not available and the message prompting formatting are displayed.   Refer to the manual that comes with the OS to format the floppy disk.
>
> - If the floppy disk contains a system, powering on or restarting the server with the floppy disk inserted boots the system from the floppy disk.

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

> **NOTE:** Make sure that the floppy disk access lamp is unlit before ejecting the floppy disk.   Ejecting the disk when the access lamp is lit may destroy the disk data.

NOTE: Use of the floppy disk

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).

■ Keep the floppy disk away from cigarette smoke.

■ Keep the floppy disk away from any liquid (e.g., water) and chemicals.

■ Keep the floppy disk away from any magnetic objects (e.g., magnet).

■ Do not pinch the floppy disk with a paper clip or drop it.

■ Keep the floppy disk in a floppy disk case that protects it from magnetism and dust.

■ 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.

Write-protect switch

Write disable   Write enable
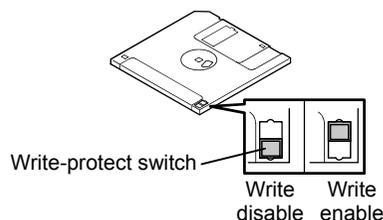
■ The floppy disk is a very delicate storage media.   Dust or thermal changes, as well as operator's misconduct or sever failures, may cause loss of data.   To avoid loss of data, NEC recommends that you should make a back-up copy of your valuable data on a regular basis.   (Make sure to make a back-up copy of every floppy disk provided with the server.)

CD-ROM Drive

Your server is provided with the CD-ROM drive on its front to read data from a CD-ROM (read-only compact disk).   The CD-ROM provides larger and faster data read than the floppy disk.

⚠ 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 1-3 to 1-8 for details.

■ Do not leave the tray ejected from the CD-ROM drive.

NOTE: Depending on your order, the DVD-RAM drive may be installed at the factory.

Setting and Removing the CD-ROM

Make sure that the server is powered (the POWER/SLEEP lamp is lit) before inserting a CD-ROM into the CD-ROM drive.

Press the Open/Close button on the front of the CD-ROM drive to eject the tray.   With the CD-ROM label facing up, place a CD-ROM in the tray gently and securely.
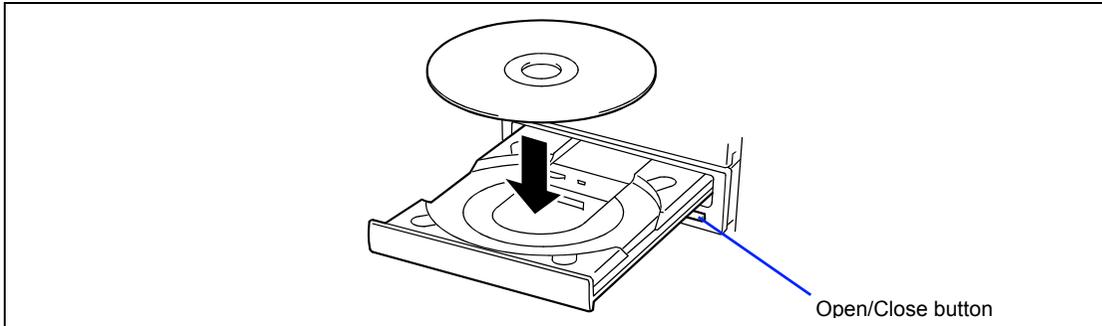
Open/Close button

Press the Open/Close button or gently push on the tray front.   The tray is automatically retracted into the CD-ROM drive.
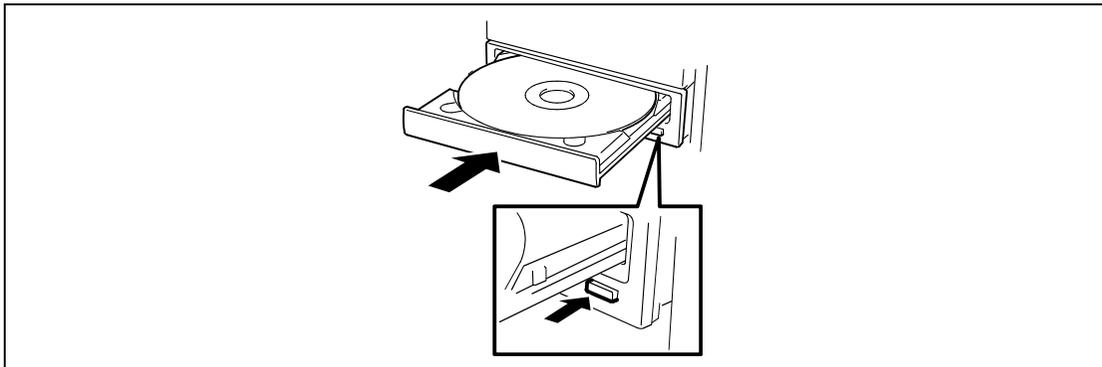
> **IMPORTANT:** If the CD-ROM drive produces large noise after the setting of a CD-ROM, reload the CD-ROM.

To remove a CD-ROM, press the Open/Close button to eject the tray, as described for inserting it, and then take the CD-ROM out of the tray.   (The orange-lit access lamp indicates ongoing disk access.   The Open/Close button does not work while the lamp is lit.)

Your OS may have a command to eject the tray.

When you have taken out the CD-ROM, retract the tray back in place.

When you fail to eject:

When you fail to eject the CD-ROM tray with the Open/Close button and take out the CD-ROM from the server, follow the procedure below.

   1. Press the POWER switch to power off the server.   (The POWER/SLEEP lamp 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 make a substitute) into the emergency hole on the right front of the CD-ROM drive and gently push it in until the tray is ejected.
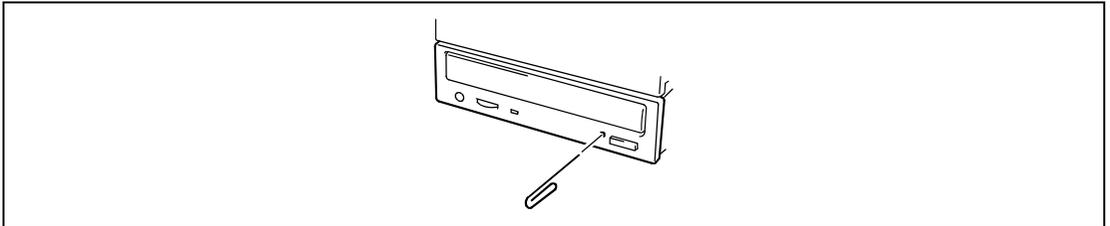
> ### IMPORTANT:
>
> - Do not use a toothpick or plastic stick that is easy to break.
> - If the above procedure does not let you take out the CD-ROM, contact your sales agent.

   3. Hold the tray and pull it out.

   4. Take out the CD-ROM.

   5. Push the tray back into position.

Use of the CD-ROM

Keep the following notes in mind to use the CD-ROM for the server:

- For the disk which does not conform to the CD standard, the playback of such a disk with the CD drive is not guaranteed.

- Do not drop the CD-ROM.

- Do not place anything on the CD-ROM or bend the CD-ROM.

- Do not attach any label onto the CD-ROM.

- Do not touch the signal side (nothing is printed on this side) with your hand.

- Place the CD-ROM with its printed side upward and gently put it on the tray.

- Do not scratch the CD-ROM or write anything directly on it with a pencil or ball-point pen.

- Keep the CD-ROM away from cigarette smoke.

- Do not leave the 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 CD-ROM, wipe the CD-ROM from its center to edge with a dry soft cloth slowly and gently.

- Use the CD cleaner to clean the CD-ROM.   Do not use record spray/cleaner, benzene, or thinner.

- Keep the CD-ROM in a CD-ROM case when not in use.

- If the CD-ROM emits large noise in the CD-ROM drive, remove the CD-ROM and insert it back again.

Chapter 3

Setting Up Your Server

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

SETUP FLOW

Follow the flowchart below to set up the server.

Installing optional devices

If you have purchased any optional device for the server, see Chapter 9 to install it.

⬇

Selecting the server site

Select a suitable site for the server.

⬇

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 CD-ROM.
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.

INSTALLING OPTIONAL DEVICES

To install any optional device, see Chapter 9, "Upgrading Your Server," for the installation procedure.   Proceed to the next section if you have no optional devices to install.

> **IMPORTANT:** There are third-party products (memory modules, hard disks, etc.) available for the server in the markets.   However, NEC recommends that you should use NEC products for stable operation. NEC assumes no liability for data errors and failures due to malfunction of the server resulted from installation of those third-party products.

SELECTING SERVER SITE

Read the following precautions before selecting a suitable site for your server.   The following describes installation of the server and connections to 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 1-3 to 1-8 for details.

■ Never attempt to lift the server only by yourself.
■ Do not install the server in any place other than specified.
■ Do not use or store the server in corrosive environment.

The following figure illustrates a site suitable for installing the server.
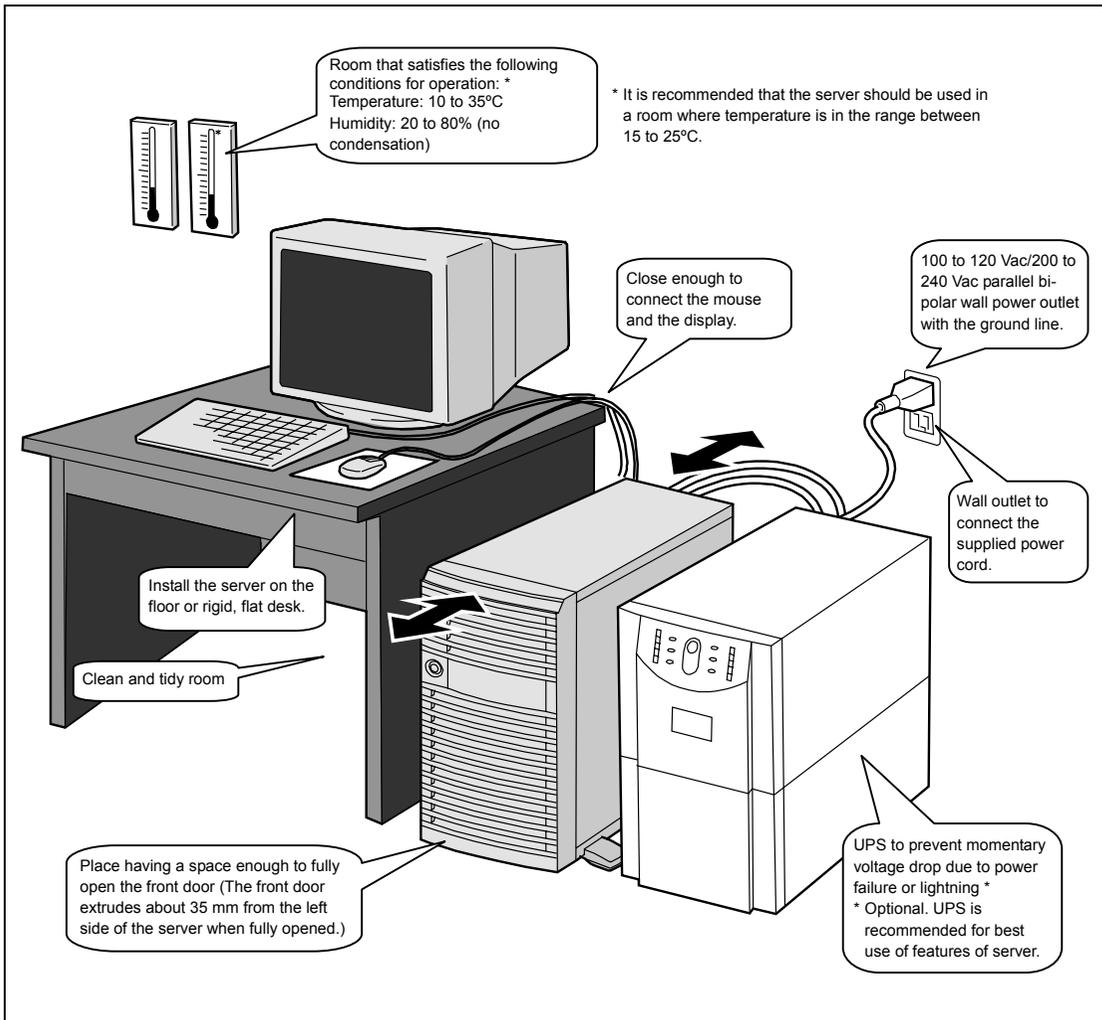
When you have selected a server site, hold the server by its bottom with at least three persons and carry it to the site, then place it slowly and gently.

> **IMPORTANT:** Do not hold the server by its front door to lift the server.   The front door may be disengaged and damage the server.

Do not install the server in the following locations as it may cause malfunctions of the server.

- Places with drastic changes in temperature (e.g., near a heater, air conditioner, or refrigerator)

- Places with strong vibration

- Places with corrosive gas in presence, near chemicals, or with possibilities of chemicals sprayed over

- On a non-antistatic carpet

- Places with possibilities of falling objects

- Places where a power outlet that shares the ground line with another (especially the one to which a device with large power consumption is connected) must be used for the server

- Do not install the server near equipment that generates power noise (e.g., contact spark at power-on/power-off of commercial power supply through a relay).   (To install the server near equipment that generates power noise, ask your sales agent for separating the power wiring or installing a noise filter.)

CONNECTING PERIPHERAL DEVICES

Connect peripheral devices to the server.   The server is provided with connectors for wide variety of peripheral devices.   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 1-3 to 1-8 for details.

■ Do not use any damaged cable connector.
■ Do not use any unauthorized interface cable.
■ Do not use the server with any loose interface connection.
■ Do not step on the interface cable or place any heavy object on it.

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 sales agent for availability of such a device or cable.   Some third-party devices may not be used for the server.

■ To connect the provided keyboard and mouse, plug their connectors to the server with the "Δ" mark on the connectors facing right.

■ Do not connect the serial ports with the telephone line directly.

Device with the USB
interface
(e.g., terminal adapter)

Mouse

Connect
appropriate
power source.

1 2

Keyboard

Display unit

Hub
(multiport repeater)

A |O|O|

Device with the serial
interface (e.g., modem)*

REAR

B |O|O|

Device with the serial interface
(e.g., modem)*

*   Direct connection to the private telephone line is prohibited.
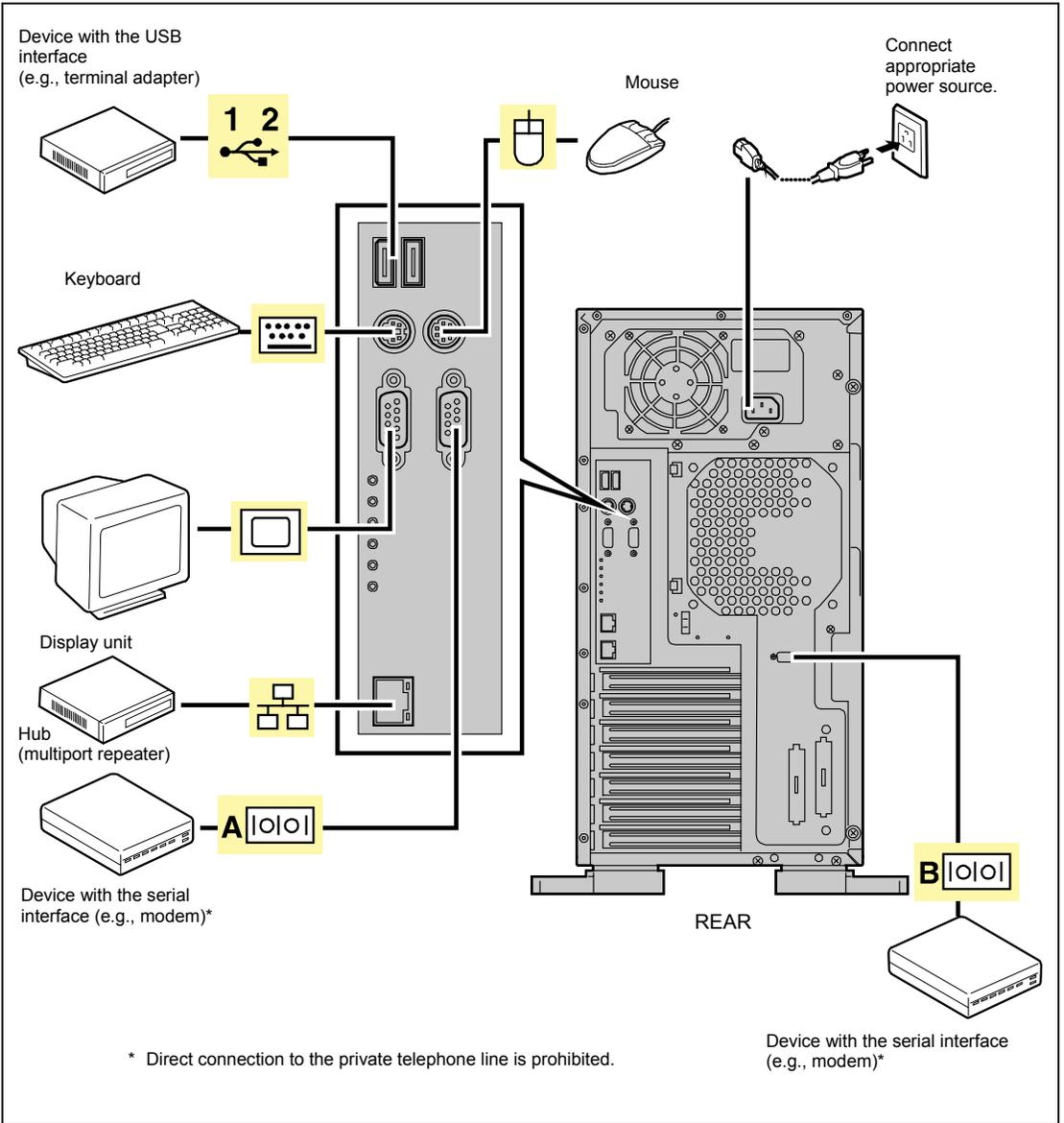
CONNECTING POWER CORD

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 1-3 to 1-8 for details. ■ Do not hold the power plug with a wet hand.

⚠ 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 1-3 to 1-8 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.
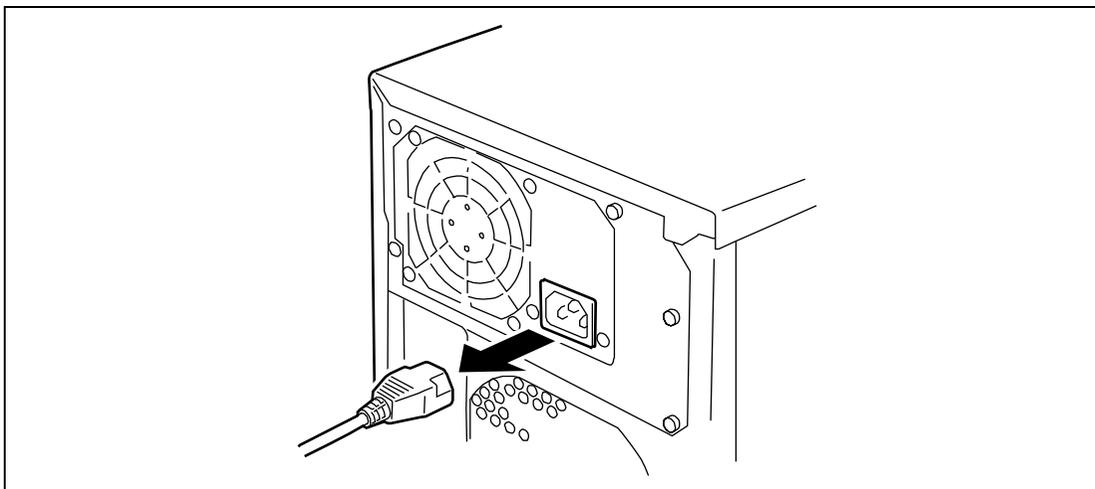
To connect the power cord from the server to an interruptive power supply (UPS), use service outlets on the rear of the UPS.

The UPS service outlets are categorized into two groups: SWITCH OUT and UN-SWITCH OUT. (They may be called "OUTPUT1" and "OUTPUT2".)

To control power supply with an application (NEC ESMPRO UPSController) that controls the UPS, connect the power cord to a SWITCH OUT outlet.

For constant power supply, connect the power cord to a UN-SWITCH OUT outlet.   (Connect the modem that is in service for 24 hours to this outlet.)

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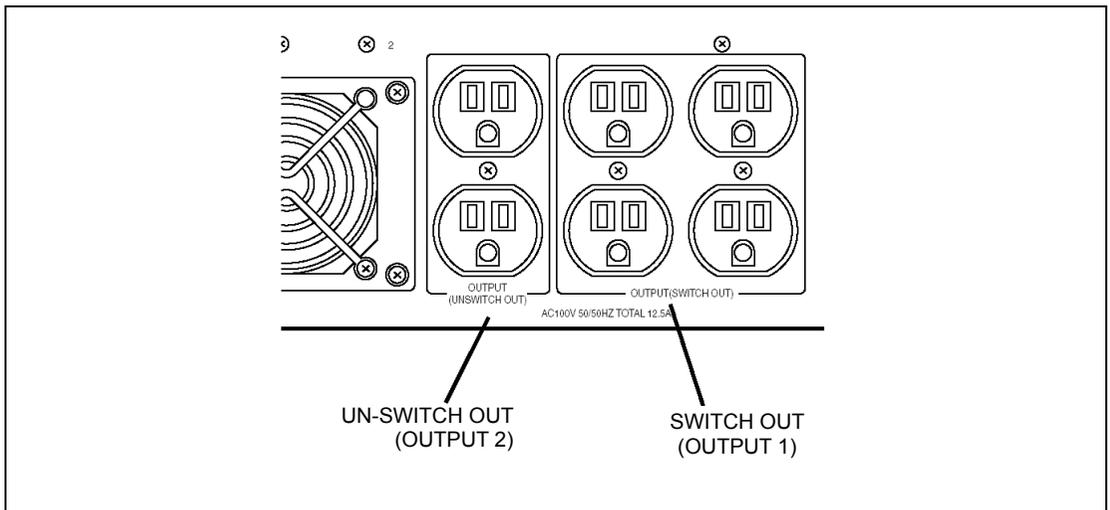
When the power cord from the server to a UPS, change the BIOS setup of the server to link with power supply from the UPS.

Change a parameter for "Resume on AC Power Loss" under the Server menu of the BIOS SETUP utility.   See Chapter 4 for details.

TURNING ON THE SERVER

Turn on the server and follow the on-screen instructions for setup.

> **IMPORTANT:** Before turning on the server:
>
> - Some optional boards require setups with the SETUP utility before installation.   If the server has a PCI board with the PCI-to-PCI bridge installed, the SETUP utility is enabled to launch.   Check on the board specifications to find out whether it requires pre-installation setups before actually installing the board.
>
> - Some installed optional devices or connected peripheral devices require setups before proceeding to the next step.

1. Make sure that the floppy disk drive contains no floppy disk and the CD-ROM drive contains no bootable CD-ROM.

2. Press the POWER switch.

> **NOTES:**
>
> - If the power cord is connected to the power control unit such as the UPS, turn on the power control unit.
>
> - Connect the power cord and wait a few seconds before pressing the POWER switch.   The POWER switch does not work in a few seconds after connecting the power cord due to firmware start-up.
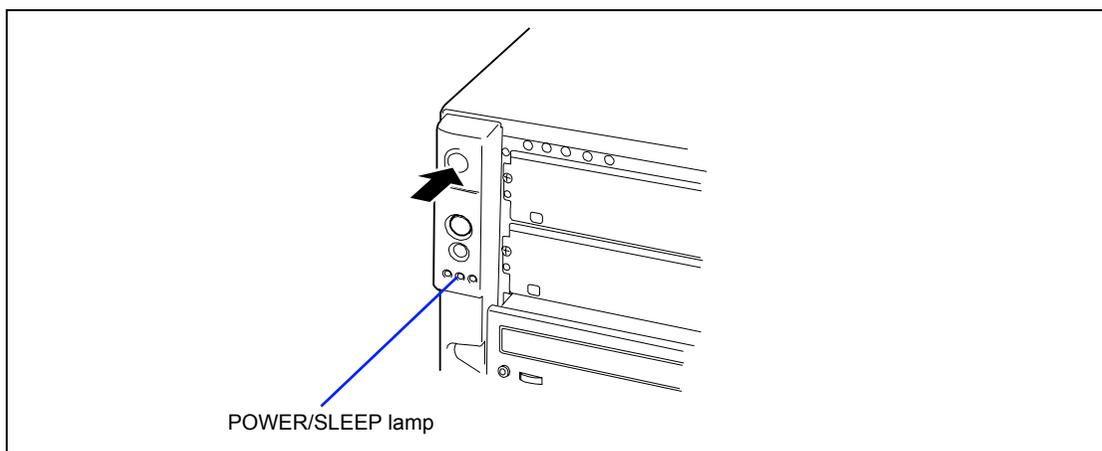
POWER/SLEEP lamp

The POWER/SLEEP lamp on the front of the server comes on.

In a few seconds, the NEC logo appears on the screen and the Power On Self-Test (POST) begins.

The POST runs automatically when you power on the server or reset it with a keyboard operation (**Ctrl** + **Alt** + **Delete**).   The POST runs diagnostics, initializes the server, sets interrupt vectors, detects installed peripheral devices, and boots the operating system (if installed).   See Chapter 2 for detailed description on POST.

If the server halts before completing the POST, the POST emits a beep code indicating a fatal system error requiring immediate attention.   (See Chapter 8, "Troubleshooting," for troubleshooting information.)

During memory test, the POST displays the amount of memory it was able to access and test.   Depending on the amount of installed memory, it may take several minutes to complete the memory test.

> **NOTE:** The factory-set is defined to hide the POST screen with the NEC logo screen.   You can always change the NEC logo screen to the POST screen by pressing **Esc**.   To change the start-up screen, use the BIOS setup utility, "SETUP."   (See Chapter 4 for details.)

During the POST, you will see the banner message to prompt you to launch the BIOS SETUP utility stored in ROM on system board or on an installed option board.

Start the BIOS SETUP utility appropriate to your system environment to change the BIOS setup. For the BIOS SETUP for the server, see Chapter 4.   For the BIOS SETUP for the option board, refer to the manual that comes with the option board.

> **IMPORTANT:**   Always allow POST to complete before turning off your system.

INSTALLING OPERATING SYSTEM

See Chapter 5 for installing Microsoft Windows 2003/2000.

To install the other operating system listed above, contact your sales agent.

> **IMPORTANT:**   Use NEC EXPRESSBUILDER for initial setup of
> your server.   The NEC EXPRESSBUILDER is a support software for
> the server.   It simplifies the process of installing and configuring your
> server.   See Chapter 6 for details on NEC EXPRESSBUILDER.

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. Set the "NEC EXPRESSBUILDER" CD-ROM in the CD-ROM drive and reboot the
system.

2. Select [Tools].

3. Select [Off-line Maintenance Utility].

4. Select [System Information Management].

5. Set a floppy disk in the floppy disk drive.

6. Select [Save].

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.

If your system has been factory configured, the BIOS SETUP 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, or upgrade your system board.

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)

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

The server is configured with the correct parameters using the SETUP utility and shipped in the best conditions. Thus, you 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 appear on your SETUP utility, thus, may differ from descriptions in this manual. If you find anything unclear, see the online help or ask your sales agent.

Starting SETUP Utility

A few seconds after powering on, the following message appears at bottom left on the screen.

> Press <F2> to enter SETUP

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

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

> Enter CURRENT password:[   ]

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

> **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.   (Key functions are also listed at the bottom of the screen.)

Indicates the current menu.

```
                              BIOS SETUP UTILITY
        Advanced

    IDE Configuration                                Disabled: disables the
                                                     integrated P-ATA
    Onboard P-ATA Channels        [Both]             Controller.
    Onboard S-ATA Channels        [Enabled]          Primary: enables only
    Configure S-ATA as RAID       [Disabled]         the Primary P-ATA
    S-ATA Ports Definition        [A1-3rd M/A2-4th M]  Controller.
  ▶ Mixed P-ATA / S-ATA                              Secondary: enables
                                                     only the Secondary
  ▶ Primary IDE Master          : [ATAPI CDROM]      P-ATA Controller.
  ▶ Primary IDE Slave           : [Not Detected]     Both: enables both
  ▶ Secondary IDE Master        : [Not Detected]     P-ATA Controllers.
  ▶ Secondary IDE Slave         : [Not Detected]
  ▶ Third IDE Master            : [Hard Disk]        ←→    Select Screen
  ▶ Fourth IDE Master           : [Not Detected]     ↑↓    Select Item
                                                     +-    Change Option
    Hard Disk Write Protect       [Disabled]         F1    General Help
    IDE Detect Time Out (Sec)     [35]               F10   Save and Exit
    ATA(PI) 80Pin Cable Detection [Host & Device]    ESC   Exit

               v02.56 (C)Copyright 1985-2004, American Megatrends, Inc.
```

Indicates there are submenus.

Online help window

Explanation of key functions

Setup item menu

Parameter (high-lights upon selection) menu

Cursor (↑, ↓):	Selects an item on the screen. The highlighted item is currently selected.
Cursor (←, →):	Selects the Main, Advanced, Security, Server, Boot, or 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	Displays the previous screen.
F1:	Press **F1** when you need help on SETUP operations. The help screen for SETUP operations appears. Press **Esc** to return to the previous screen.
F9:	Sets the parameter of the currently displayed item back to the factory set parameter.
F10:	Sets the parameter back to the one stored by the server before the SETUP utility was started.

Menu and Parameter Descriptions

The SETUP utility has the following six major menus:

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

To set minute functions, select a submenu from the above menus.   The following describes available functions and parameters, as well as the factory-set, for each menu.

Main

Option	Parameter	Description	Your Setting
AMI BIOS	N/A	Display only. Displays the BIOS version and build date.	
Processor	N/A	Display only. Displays processor information. For details, see Processor Configuration submenu in the Advanced menu.	
System Memory Size	N/A	Display only. Displays the system memory size installed in your server.	
Server Board MCH Stepping	N/A	Displays revision of the chipset installed on the mother board.	
System Time	HH:MM:SS	Sets the system time.	
System Date	DAY MM/DD/YYYY	Sets the system date.	
Language	French German Spanish Italian [English]	Selects which language BIOS displays.	

[   ]: Factory-set

Advanced

Option	Parameter	Description	Your Setting
Processor Configuration	N/A	Displays the Processor Configuration submenu.	
Advanced Chipset Control	N/A	Displays the Advanced Chipset Control submenu.	
IDE Configuration	N/A	Displays the IDE Configuration submenu.	
Floppy Configuration	N/A	Displays the Floppy Configuration submenu.	
Super I/O Configuration	N/A	Displays the Super I/O Configuration submenu.	
USB Configuration	N/A	Displays the USB Configuration submenu.	
PCI Configuration	N/A	Displays the PCI Configuration submenu.	
Memory Configuration	N/A	Displays the Memory Configuration submenu.	

[   ]: Factory-set

Processor Configuration submenu

Option	Parameter	Description	Your Setting
Manufacturer	N/A	Display only. Displays the Processor manufacturer name.	
Brand String	N/A	Display only. Displays the processor brand ID.	
Frequency	N/A	Display only. Displays the installed processor speed.	
FSB Speed	N/A	Display only. Displays the front side bus (FSB) speed of the processor installed in your system.	
CPU 1/CPU2 CPUID	N/A	Display only. Displays the processor ID.	
CPU 1/CPU2 Cache L1/Cache L2	N/A	Display only. Displays the L1 or L2 cache size of the installed processor(s).	
Max CPUID Value Limit	[Disabled] Enabled	Selects [Enabled] if your operating system cannot support processors with extended CPUID feature.	
Execute Disable Bit	[Disabled] Enabled	When disabled, XD feature flag is set to "0". This menu is displayed only when the processor Nocona E0 step/Irwindale is installed.	
Hyper-Threading Technology	Disabled [Enabled]	Disable or enable the Hyper-Threading Technology.	
Intel® Speed Step™ Tech.	Auto [Disabled]	Selects [Auto] to allow the OS to reduce power consumption.	

[   ]: Factory-set

Advanced Chipset submenu

Option	Parameter	Description	Your Setting
Wake On LAN	[Disabled] Enabled	Specify whether the remote power-on function through embedded NIC or PCI devices in PCI slots 3 to 5 is enabled or disabled.	
Wake On PME	[Disabled] Enabled	Specify whether the remote power-on function through PCI devices in slots 1 and 2 is enabled or disabled.	
Wake On Ring	[Disabled] Enabled	Specify whether the remote power-on function through a serial port is enabled or disabled.	
Wake On RTC	[Disabled] Enabled	Specify whether the remote power-on function by using RTC alarm feature is enabled or disabled.	

[   ]: Factory-set

IDE Configuration submenu

Option	Parameter	Description	Your Setting
Onboard P-ATA Channels	Disabled [Primary] Secondary Both	Disables or configures the PATA channels to primary, secondary, or both.	
Onboard S-ATA Channels	Disabled [Enabled]	Disables or enables the onboard SATA controller.	
Configure S-ATA as RAID	[Disabled] Enabled	Selects the SATA function as and IDE controller or RAID controller.	
S-ATA Ports Definition	[A1-Master/A2-Slave] A1-Slave/A2-Master	Defines SATA port to IDE channel. "A1" indicates the left side SATA connection.	
Mixed P-ATA/S-ATA	N/A	Displays the " Mixed P-ATA/S-ATA" submenu. The " Mixed P-ATA/S-ATA" submenu defines the priority between the onboard PATA and SATA channels. See the online help displayed on the "Mixed P-ATA/S-ATA" submenu for details.	
Primary IDE Master Primary IDE Slave Secondary IDE Master Secondary IDE Slave Third IDE Master Third IDE Slave Fourth IDE Master Fourth IDE Slave	N/A	BIOS detects the IDE devices at power-on and displays the current status of the detected IDE devices. Select each menu to display the submenu. In the submenu, you can configure the IDE devices such as a device type, PIO mode, DMA mode, S.M.A.R.T. feature, data transfer rate and so on.	
Hard Disk Write Protect	[Disabled] Enabled	Disables or enables hard disk drives write protection through BIOS.	
IDE Detect Time Out (Sec)	0 5 10 15 20 25 30 [35]	Select the time out value for detecting ATA/ATAPI devices. This option is used to detect an older IDE device with longer spin up times.	
ATA(PI) 80Pin Cable Detection	[Host & Device] Host Device	Uses a mechanical 80-pin interface cable to detect the host and/or device(s).	

[   ]: Factory-set

Floppy Configuration submenu

Option	Parameter	Description	Your Setting
Floppy A	Disabled 720KB 3.5 [1.44 MB 3.5] 2.88MB 3.5	Set the settings of floppy disk drive A (standard configuration).	
Onboard Floppy Controller	Disabled [Enabled]	Disables or enables the onboard floppy drive controller.	

[ ]: Factory-set

Super I/O Configuration submenu

Option	Parameter	Description	Your Setting
Serial Port A Address	Disabled [3F8/IRQ4] 2F8/IRQ3 3E8/IRQ4 2E8/IRQ3	Disables or selects the I/O port address and interrupt for serial port A.	
Serial Port B Address	Disabled 3F8/IRQ4 [2F8/IRQ3] 3E8/IRQ4 2E8/IRQ3	Disables or selects the I/O port address and interrupt for serial port B.	

[ ]: Factory-set

USB Configuration submenu

Option	Parameter	Description	Your Setting
USB Devices Enabled	–	Display only. Displays a list of USB devices detected by BIOS.	
USB Function	Disabled [Enabled]	If disabled, the USB ports do not accept the USB device class 3 (HID: Human Interface Device).	
Legacy USB Support	Disabled Keyboard Only [Auto] Keyboard and Mouse	Selects whether the USB keyboard is made available in OS which does not support USB formally.	
Port 64/60 Emulation	[Disabled] Enabled	Enables I/O port 60h/64h emulation for using the USB keyboard with the non-USB aware operating systems.	
USB 2.0 Controller	[Enabled] Disabled	Enables or disables the USB 2.0 controller.	
USB 2.0 Controller Mode	FullSpeed [HiSpeed]	Selects the transfer speed on USB 2.0.	
USB Mass Storage Device Configuration	N/A	Displays the USB Mass Device Configuration submenu.	

[ ]: Factory-set

USB Mass Storage Device Configuration submenu

Option	Parameter	Description	Your Setting
USB Mass Storage Reset Delay	10 Sec [20 Sec] 30 Sec 40 Sec	Number of seconds POST waits for the USB mass storage device after start unit command.	
Device #1	Device	Display only. Displays the USB mass storage device detected by BIOS.	
Emulation Type	[Auto] Floppy Forced FDD Hard Disk CDROM	If Auto, USB devices less than 530MB will be emulated as Floppy and remaining as hard drive. Forced FDD option can be used to force a HDD formatted drive to boot as FDD (Ex. ZIP drive).	

[   ]: Factory-set

PCI Configuration submenu

Option	Parameter	Description	Your Setting
Onboard Video	Disabled [Enabled]	Enables or disables the onboard video controller.	
Dual Monitor Video	[Disabled] Enabled	Select which graphics controller to use in as the primary boot device. Enabled selects the onboard device.	
Onboard NIC 1 (10/100/1000)	Disabled [Enabled]	Enables or disables the onboard network interface controller.	
Onboard NIC 1 (10/100/1000) ROM	Disabled [Enabled]	Enables or disables the option ROM scan for the onboard network interface controller.	
Slot 1 Option ROM Slot 2 Option ROM Slot 3 Option ROM Slot 4 Option ROM Slot 5 Option ROM	Disabled [Enabled]	Initializes device expansion ROM.	

[   ]: Factory-set

Memory Configuration submenu

Option	Parameter	Description	Your Setting
DIMM 1A/1B/2A/2B	Normal Not installed Disabled	Displays the current status of the memory bank. Disabled indicates that a DIMM in the bank has failed and the entire bank has been disabled.	
Extended Memory Test	1MB [1KB] Every location Disabled	"1MB" indicates that the memory test is done in the unit of 1MB. "1KB" indicates that the memory test is done in the unit of 1KB. "Every location" tests every memory location. "Disabled" indicates that only memory initialization is done.	
Memory Retest	[Disabled] Enabled	Causes BIOS to retest all memory on the next boot.	
Memory Remap Feature	Disabled [Enabled]	If enabled, BIOS allows the remapping of overlapped PCI memory above the total physical memory.	
Memory Sparing	[Disabled] Enabled	Enables or disables the spare memory feature.	

[   ]: Factory-set

Boot

Option	Parameter	Description	Your Setting
Boot Settings Configuration	N/A	Displays Boot Settings Configuration submenu.	
Boot Device Priority	N/A	Displays the Boot Device Priority submenu.	
Hard Disk Drives	N/A	Displays the Hard Disk Drives submenu. In the submenu, specify the 1st drive from the option.	
Removable Drives	N/A	Displays the Removable Drives submenu. In the submenu, specify the 1st drive from the option.	
CD/DVD Drives	N/A	Displays the CD/DVD Drives submenu. In the submenu, specify the 1st drive from the option.	

[   ]: Factory-set

Boot Settings Configuration submenu

Option	Parameter	Description	Your Setting
Quick Boot	Disabled [Enabled]	This option allows BIOS to skip several tests during the POST sequence. This will decrease the time required for booting the system.	
Quiet Boot	Disabled [Enabled]	If enabled, the BIOS will display the NEC logo during POST. Press **Esc** to switch to the POST execution screen.	
Bootup Num-Lock	[Off] On	Sets power on Numlock state.	
PS/2 Mouse Support	Disabled Enabled [Auto]	Specify whether BIOS supports for PS/2 mouse.	
Post Error Pause	Disabled [Enabled]	Indicates whether POST is aborted once at the end of POST if an error occurs during the execution of POST.	
Hit 'F2' Message Display	Disabled [Enabled]	Displays "Press F2 to run Setup" message in POST.	
Scan User Flash Area	[Disabled] Enabled	This option allows BIOS to scan the flash ROM for user area.	

[   ]: Factory-set

Boot Device Priority submenu

The Boot Device Priority submenu specifies the boot sequence from the available drives specified in the Hard Disk Drives, Removable Drives, and CD/DVD Drives submenus, the onboard network interface controller (for PXE boot), and the EFI boot function.

The factory-default boot order is listed below.

> 1. CD-ROM drive
>
> 2. Floppy disk drive
>
> 3. Hard disk drive
>
> 4. Network interface controller
>
> 5. EFI

The server searches for devices in the order set in this menu on booting.   Finding the boot software, the server starts the software.

The priority of the boot devices can be changed by using the ↑, ↓, **+**, and **-** keys.   Move the cursor to the desired device with the ↑ or ↓ key and change the priority with the **+** or **-** key.

> **IMPORTANT:** To boot NEC EXPRESSBUILDER, set the priority of the devices listed above.

Security

IMPORTANT: Set the passwords only after OS is installed.

Option	Parameter	Description	Your Setting
Administrator Password Is	Installed Not Installed	Status only, user cannot modify. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (see Configuring Mother Board Jumpers in this Chapter).	
User Password Is	Installed Not Installed	Status only, user cannot modify. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (see Configuring Mother Board Jumpers in this Chapter).	
Set Administrator Password	Up to seven alphanumerics	When the **Enter** key is pressed, the user is prompted for a password; press **Esc** key to abort. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (refer to Configuring Mother Board Jumpers in this chapter). Set password to null to clear.	
Set User Password	Up to seven alphanumerics	Administrator password controls access to the setup utility. When **Enter** is pressed, the user is prompted for a password; press **Esc** to abort. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (refer to Configuring Mother Board Jumpers in this chapter). Set password to null to clear.	
User Access Level	No Access View Only Limited [Full Access]	"No Access" prevents user access to the SETUP utility. "View Only" allows access to the SETUP utility but no parameters are changeable. "Limited" allows only limited fields to be changed.	
Clear User Password	Press **Enter**	Running this menu immediately clears the user password.	
Fixed disk boot sector protect	[Disabled] Enabled	Will write protect the boot sector of the hard drive to prevent viruses from corrupting the drive under DOS if set to write protect.	
Password on boot	[Disabled] Enabled	Disables or enables password entry on boot.	

Option	Parameter	Description	Your Setting
Secure Mode Timer	[1 Minute] 2 Minutes 5 Minutes 10 Minutes 20 Minutes 60 Minutes 120 Minutes	Set the period from no input from the keyboard or mouse to the point at which the system enters into the secure mode.	
Security Hot Key CTRL-ALT-	[L] Z	Specify the hot key to invoke secure mode features. Pressing the assigned key along with **Ctrl** and **Alt** invoke secure mode. This option is enabled when User Password is set.	
Secure Mode Boot	[Disabled] Enabled	Specify whether the system boots in secure mode. This option is enabled when User Password is set. The keyboard will remain locked until a password is entered.	
Front Panel Switch Inhibit	[Disabled] Enabled	Enables or disables the POWER switch. If "Enabled" is selected, power-off with the POWER switch becomes unavailable after OS boot-up. (Forced shut down also becomes unavailable. Forced shut down is a feature to shut down by pressing the POWER switch for at least four seconds.)	
NMI Control	Disabled [Enabled]	Enables or disables the DUMP switch on the front panel.	

[   ]: Factory-set

Server

Option	Parameter	Description	Your Setting
System Management	N/A	System Management submenu is displayed.	
Serial Console Features	N/A	Serial Console Features submenu is displayed.	
Event Log Configuration	N/A	Event Log Configuration submenu is displayed.	
Assert NMI on PERR	Disabled [Enabled]	Indicates whether PCI PERR is supported or not.	
Assert NMI on SERR	Disabled [Enabled]	Indicates whether PCI SERR is supported or not.	
Resume on AC Power Loss	[Stays Off] Power On	Indicates the AC LINK function. Shows the state of the power of the server.	
FRB-2 Policy	[Retry on Next Boot] Disable FRB2 Timer	Selects action if the boot processor will be disabled.	
Late POST Timeout	[Disabled] 5 minutes 10 minutes 15 minutes 20 minutes	Selects time limit for searching add-in card. The system will be reset on timeout.	
Hard Disk OS Boot Timeout	[Disabled] 5 minutes 10 minutes 15 minutes 20 minutes 25 minutes 30 minutes 35 minutes 40 minutes 45 minutes 50 minutes 55 minutes 60 minutes	Selects time limit for booting an operating system installed in the hard disk drive. The action taken on timeout is determined by the Fault Resilient Boot Timer policy option.	
PXE OS Boot Timeout	[Disabled] 5 minutes 10 minutes 15 minutes 20 minutes 25 minutes 30 minutes 35 minutes 40 minutes 45 minutes 50 minutes 55 minutes 60 minutes	Selects time limit for booting an operating system using PXE boot. The action taken on timeout is determined by the OS Watchdog Timer policy option.	

Option	Parameter	Description	Your Setting
OS Watchdog Timer Policy	Always Reset [Retry 3 Times]	This option controls the policy upon PXE boot timeout. If [Retry 3 times] is selected, the system is reset after the occurrence of timeout and OS boot is retried up to three times. The failure in the third boot causes the system reboot. If [Always Reset] is selected, the system is reset after the occurrence of timeout and OS boot is retried repeatedly.	
Platform Event Filtering	Disabled [Enabled]	Disables or enables triggers for system sensor events.	
Temperature Sensor	[Disabled] Enabled	Indicates whether the temperature sensor monitoring function is enabled or disabled.	
Post Error Pause	Disabled [Enabled]	Indicates whether POST is aborted once at the end of POST if an error occurs during the execution of POST.	

[   ]: Factory-set

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

System Management Submenu

Option	Parameter	Description	Your Setting
Server Board Part Number	N/A	Display only. Displays the mother board part number.	
Server Board Serial Number	N/A	Display only. Displays the mother board serial number.	
NIC1 Mac Address	N/A	Display only. Displays the MAC Address for onboard network interface controller.	
System Part Number	N/A	Display only. Displays the system part number.	
System Serial Number	N/A	Display only. Displays the System serial number.	
Chassis Part Number	N/A	Display only. Displays the chassis part number.	
Chassis Serial Number	N/A	Display only. Displays the chassis serial number.	
BIOS Version	N/A	Display only. Displays the BIOS build version.	
BMC Device ID	N/A	Display only. Displays the BMC device ID.	
BMC Firmware Revision	N/A	Display only. Displays the revision for BMC firmware.	
BMC Device Revision	N/A	Display only. Displays the revision for BMC device.	
PIA Revision	N/A	Display only. Displays the revision for platform information area.	
SDR Revision	N/A	Display only. Displays the revision for sensor data record area.	

[   ]: Factory-set

Console Redirection Submenu

Option	Parameter	Description	Your Setting
BIOS Redirection Port	[Disabled] Serial Port A Serial Port B	Specify the address/interrupt of the serial port to which a remote console is connected.	
Baud Rate	9600 [19.2K] 38.4K 57.6K 115.2K	Specify the baud rate used for the interface with successive remote consoles.	
Flow Control	No Flow Control [CTS/RTS] Xon/Xoff CTS/RTS+CD	Specify the flow control method.	
Terminal Type	PC ANSI [VT100+] VT-UTF8	Specify the type of remote console.	
ACPI Redirection Port	[Disabled] Serial Port A Serial Port B	Specify the serial port to which an ACPI console is connected.	

[   ]: Factory-set

Event Log Configuration submenu

Option	Parameter	Description	Your Setting
Clear All Event Logs	[Disabled] Enabled	Press **Enter** and select "Enable" to initialize the system event log.	
BIOS Event Logging	Disabled [Enabled]	Select to allow logging of BIOS events.	
Critical Event Logging	Disabled [Enabled]	Select to allow logging of the critical system errors. The critical system errors are fatal to system operations such as PERR, SERR, ECC.	
ECC Error Logging	Disabled [Enabled]	Select to allow logging of ECC error events.	
PCI Error Logging	Disabled [Enabled]	Select to allow logging of PCI error events.	
FSB Error Logging	Disabled [Enabled]	Select to allow logging of front-side bus error events.	
Hublink Error Logging	Disabled [Enabled]	Select to allow logging of hublink error events.	

[   ]: Factory-set

Exit

The options on the menu are described below.

Save Changes and Exit

Exit after writing all modified BIOS SETUP item values to CMOS.

Discard Changes and Exit

Exit leaving CMOS unmodified. User is prompted if any of the setup fields ware modified.

Discard Changes

Read the previous values of the all BIOS Setup items from CMOS.

Load Setup Defaults

Load default values for all BIOS Setup items.

> **IMPORTANT:** This option sets [Configure S-ATA as RAID] in the [IDE Configuration] submenu of the [Advanced] menu to [Disabled]. If the SATA hard disk drives are installed in your server and the onboard SATA RAID feature is used, change the parameter of the [Configure S-ATA as RAID] from [Disabled] to [Enabled] before exiting BIOS SETUP utility.

Load Custom Defaults

Load custom defaults.

Save Custom Defaults

Save the current settings as custom defaults.

CONFIGURING MOTHER BOARD JUMPERS

With the pre-installed SETUP utility, you can set desired passwords to protect the data stored in the server against access from unauthorized users.   When you forget the passwords, however, you may want clear them.   The following describes how to clear these passwords.   You can also use the following procedure to clear the CMOS data in the server.

> **IMPORTANT:** Clearing the CMOS data resumes the factory-set configuration data.

To clear passwords or the CMOS data, use the jumper switch on the mother board of the server. The following figure illustrates the jumper switch location.

> **IMPORTANT:** Do not change any other switch settings.   Any change may cause the server to fail or malfunction.
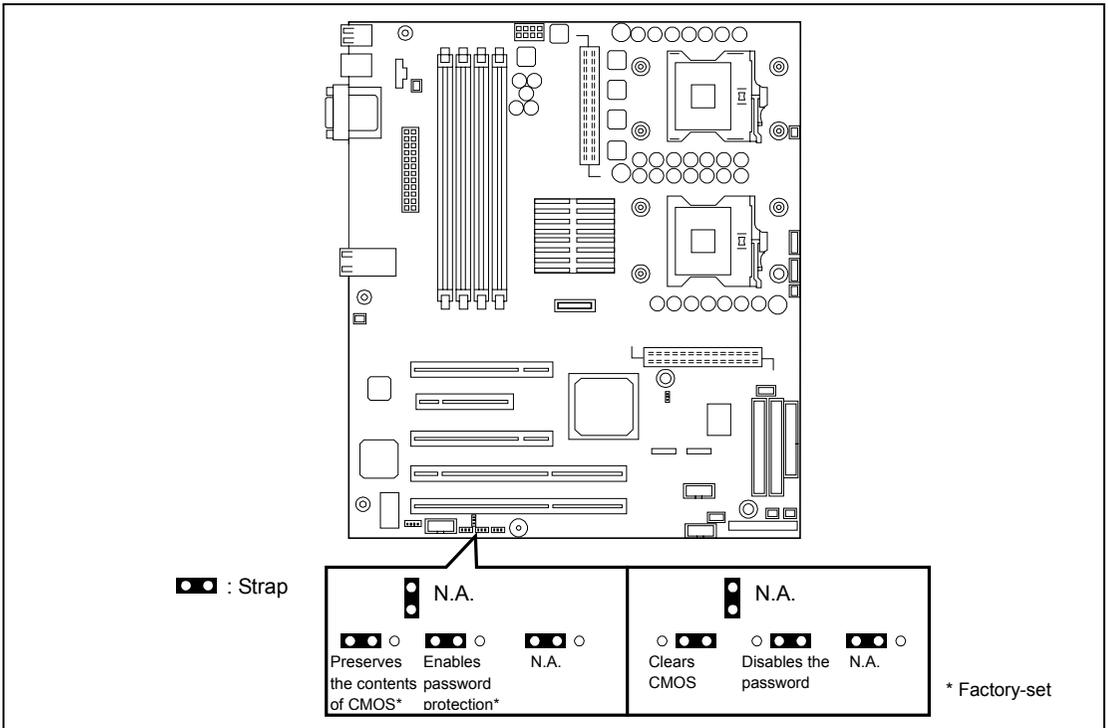
The following describe the clearing procedure.

> ### ⚠ 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 manual.   Failure to follow this instruction may cause an electric shock or fire as well as malfunctions of the server.

1. Power off the server and unplug the power cord.

2. Remove the left side cover from the server (see Chapter 9).

3. Change the desired jumper switch setting.

> #### IMPORTANT:
> - Use the clip over jumper pins on the mother board.
> - Do not lose the clip.

4. Reassemble the server and press the POWER switch.

During POST, the following code and message are displayed on the screen.

5120 CMOS cleared by jumper

or

5121 Password cleared by jumper

5. Power off the server upon completion of POST.

6. Restore the jumper switch setting and power on the server for reconfiguration.

RAID CONFIGURATION UTILITY

Your server includes the serial ATA RAID controller by supporting the RAID levels 0 and 1. The Array Configuration Utility (ACU) that is an embedded BIOS utility is used to create, configure, and manage arrays.

> **NOTES:**
>
> - You can also configure the SATA RAID drive by using NEC EXPRESSBUILDER. Refer to Chapter 6 for detail.
>
> - To configure the RAID drive with the SCSI or IDE hard disk drives, purchase the optional RAID controller board and hard disk drives.

Installing the Hard Disk Drives

Install the two serial ATA hard disk drives to your server. Refer to Chapter 9 for detail.

> **IMPORTANT:** Use hard disks of the same capacity and revolution.

Activating the SATA RAID Feature

To run the Array Configuration Utility (ACU), run the BIOS setup utility and change the [Configure S-ATA as RAID] option in the [IDE Configuration] submenu of the [Advanced] menu to "Enabled". Refer to "System BIOS (BIOS SETUP Utility)" described earlier in this chapter for detail.

Running the Array Configuration Utility (ACU)

To run ARC, press **Ctrl** + **A** when prompted by the following message during the system startup:

Press <Ctrl><A> for Adaptec RAID Configuration Utility

The ARC menu appears, presenting these options:

- Array Configuration Utility (ACU)
- Disk utilities
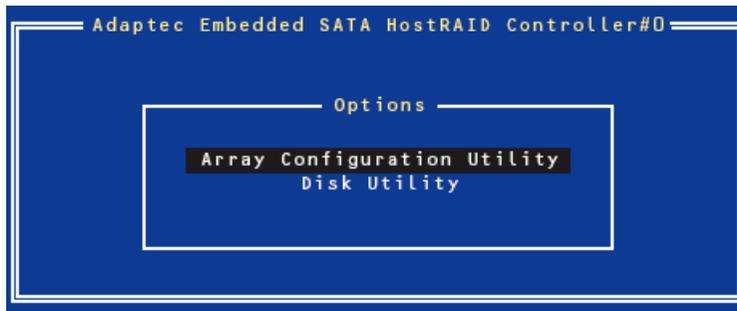
To select an option from this menu, browse with the arrow keys and then press **Enter**. In some cases, selecting an option displays another menu. To return to the previous menu at any time, press **Esc**.

Using the Array Configuration Utility

The Array Configuration Utility (ACU) enables you to create, manage, and delete arrays from the controller's BIOS, and initialize drives.

Managing Arrays

Use the Manage Arrays option to view array properties and members, and delete arrays. The following sections describe these operations in greater detail.

Viewing Array Properties

To view the properties of an existing array:

1. At the BIOS prompt, press **Ctrl** + **A**.

2. From the ACU menu, Array Configuration Utility.

3. From the main menu, select Manage Arrays.

4. From the List of Arrays dialog box, select the array you want to view and press **Enter**.

   The Array Properties dialog box appears, showing detailed information on the array. The physical disks associated with the array are displayed here.
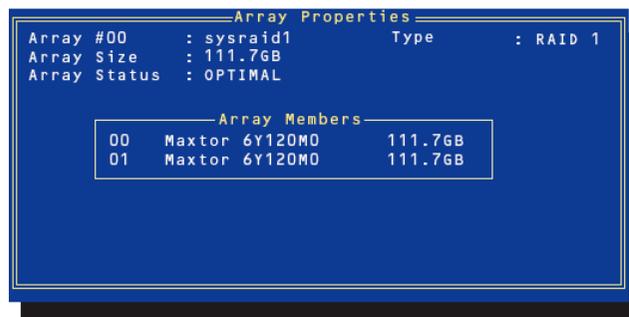
5. Press **Esc** to return to the previous menu.

Deleting Arrays

> **IMPORTANT:** Back up the data on an array before you delete it. Otherwise, all data on the array is lost. Deleted arrays cannot be restored.

To delete an existing array:

1. Turn on your server and press **Ctrl** + **A** when prompted to access the ACU.

2. From the ACU menu, Array Configuration Utility.

3. From the main menu, select Manage Arrays.

4. Select the array you wish to delete and press **Delete**.


```
═════════════════Array Properties═════════════════
Array #00      : sysraid1        Type      : RAID 1
Array Size     : 111.7GB

                [Delete]   [Cancel]
```
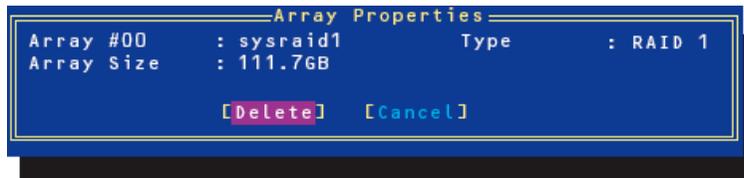
5. In the Array Properties dialog box, select Delete and press **Enter**.

   The following prompt is displayed:

   > **Warning!! Deleting the array will render array unusable. Do you want to delete the array?(Yes/No):**

   RAID 1 only—the following prompt is also displayed:

   > **Deleting the partition will result in data loss! Do you also want to delete the partition? (Yes/No):**

6. Press **Y** to delete the array or partition or **N** to return to the previous menu.

7. Press **Esc** to return to the previous menu.

Creating Arrays

Before creating arrays, make sure the disks for the array are connected and installed in your system. Note that disks with no usable space, or disks that are uninitialized are shown in gray and cannot be used. See Initializing Disk Drives described later.

To create an array:

1. Turn on your server and press **Ctrl** + **A** when prompted to access the ACU.

2. From the ACU menu, Array Configuration Utility.

3. From the main menu, select Create Array.
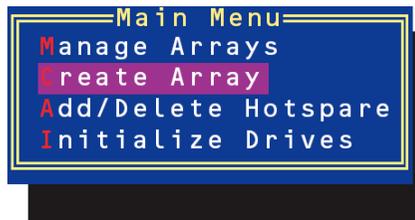
4. Select the disks for the new array and press **Insert**. To deselect any disk, highlight the disk and press **Delete**.
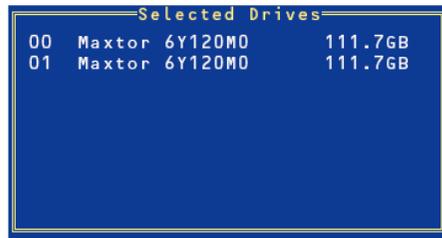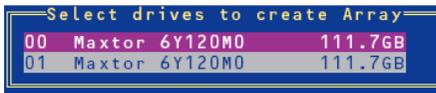
5. Press **Enter** when both disks for the new array are selected.

The Array Properties menu displays.

Assigning Array Properties

> **NOTE:** Once the array is created and its properties are assigned, you cannot change the array properties using the ACU. Instead, use Adaptec Storage Manager - Browser Edition. (See Chapter 6 for details.)

To assign properties to the new array:

1. In the Array Properties menu, select an array type and press **Enter**. Note that only the available array types, RAID0 and RAID1, are displayed. Each of these types requires two drives.

```
═══════════ Array Properties ═══════════
 Array Type      :   ┌──────────────────┐
                     │  RAID 0(Stripe)  │
                     │  RAID 1(Mirror)  │
 Array Label     :   └──────────────────┘

 Array Size      :   223.500 GB

 Stripe Size     :   64KB

 Create RAID via :

                     [Done]
```
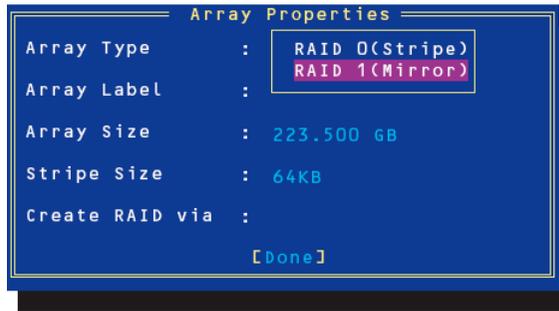
2. Type in an optional label for the array and press **Enter**.

```
═══════════ Array Properties ═══════════
 Array Type      :   RAID 1(Mirror)

 Array Label     :   sysraid1

 Array Size      :   111.750 GB

 Stripe Size     :   N/A

 Create RAID via :

                     [Done]
```

3. For RAID0, select the desired stripe size. Available stripe sizes are 16, 32, and 64 KB (default).

> **NOTE:** NEC recommends that you do not change the default.

4. Create RAID via allows you to select between the different creation methods for RAID0 and RAID1. The following table gives examples of when each is appropriate.
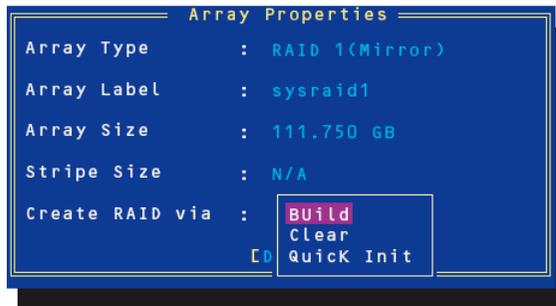
RAID level	Create via	When appropriate
RAID0	No Init	Creating a RAID0 on new drives.
RAID0	Migrate*	Creating a RAID0 from on new drive and one drive with data you wish to preserve.
RAID1	Build*	Any time you wish to create RAID1, but especially if you have data on one drive that you wish to preserve.
RAID	Clear	Creating a RAID1 on new drives, or when you want to ensure that the array contains no data after creation.
RAID1	Quick Init	Fastest way to create a RAID1. Appropriate when using new drives.

NOTES:

- Before adding a new drive to an array, back up any data contained on the new drive. Otherwise, all data will be lost.

- If you stop the Build or Clear process on a RAID1 from ACU, you can only restart it from Adaptec Storage Manager - Browser Edition. (See Chapter 6 for details.)

- A RAID1 created using the Quick Init option may return some data miscompares if you later run a consistency check. This is normal and is not a cause for concern.

- The ACU allows you to use drives of different sizes in a RAID1. During a build operation however, only the smaller drive can be selected as the source or first drive.

- When migrating from single volume to RAID0, migrating from a larger drive to a smaller drive is allowed. However the destination drive must be at least half the capacity of the source drive.

- Adaptec does not recommend that you migrate or build an array on Windows dynamic disks (volumes), as it will result in data loss.

5. Select a source drive from the Select Source Drive list box and press **Enter**.

```
═════════ Select Source Drive ═════════
  00    Maxtor 6Y120M0      111.7GB
  01    Maxtor 6Y120M0      111.7GB
```

6. When you are finished, press **Done**.

```
──────────── Array Properties ────────────
Array #00     : sysraid1        Type      : RAID 1
Array Size    : 111.7GB
Array Status  : BUILDING     17% Block #: 40908000

            ── Array Members ──
     00    Maxtor 6Y120M0      111.7GB
     01    Maxtor 6Y120M0      111.7GB
```

Initializing Disk Drives

If an installed disk does not appear in the disk selection list for creating a new array or if it appears grayed out, you may have to initialize it before you can use it as part of an array. Drives attached to the controller must be initialized before they can be used in an array.

> **IMPORTANT:** Initializing a disk overwrites the partition table on the disk and makes any data on the disk inaccessible. If the drive is used in an array, you may not be able to use the array again. Do not initialize a disk that is part of a boot array. To determine which disks are associated with a particular array, see Viewing Array Properties described earlier in this section.

To initialize drives:

1. Turn on your server and press **Ctrl** + **A** when prompted to access the ACU.

2. From the ACU menu, Array Configuration Utility.

3. Select Initialize Drives.

4. Use the up and down arrow keys to highlight the disk you wish to initialize and press **Insert**.

5. Repeat Step 3 so that both drives to be initialized are selected.

6. Press **Enter**.

7. Read the warning message and ensure that you have selected the correct disk drives to initialize. Type **Y** to continue.

Using the Disk Utilities

The Disk Utilities enable you to format or verify the media of your Serial ATA hard disks.

To access the disk utilities:

1. Turn on your server and press **Ctrl** + **A** when prompted to access the ACU.

2. From the ACU menu, select Disk Utilities.
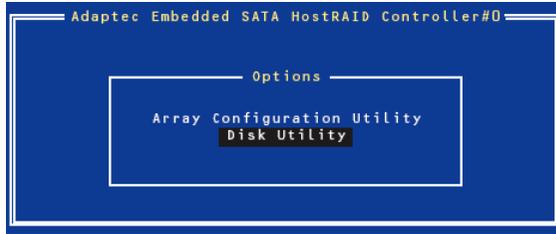
3. Select the desired disk and press **Enter**.

You are offered the following options:

■ **Format Disk**—Simulates a low-level format of the hard drive by writing zeros to the entire disk. Serial ATA drives are low-level formatted at the factory and do not need to be low-level formatted again.

> **IMPORTANT:** Formatting destroys all data on the drive. Be sure to back up your data before performing this operation.

■ **Verify Disk Media**—Scans the media of a disk drive for defects.

ADD-IN CARD'S BIOS

Refer to the documentation coming with the optional add-in card for details.

When the server has multiple optional PCI boards installed, the server first displays the start-up message of the BIOS SETUP Utility of the mother board.   It then displays the utility start-up message for optional PCI boards one by one.   The start-up message appears for the optional PCI board in the PCI #1 slot first, then PCI #2, PCI #3, PCI #4, and finally PCI #5.   The message displayed may vary depending on the optional PCI board.   Refer to the manual that comes with the optional PCI board for details.

(This page is intentionally left blank.)

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 2003 Standard Edition
- Microsoft® Windows® 2000 Server

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.

This chapter also includes information on configuring the HostRAID™ drive used with the onboard serial ATA interface. Refer to the end of this chapter for detail.

About Express Setup

"Express Setup" contained in your NEC EXPRESSBUILDER CD-ROM is intended for initial setup of the server.   Its automatic installation mode guides the user easily through the process by detailing specific hardware features and providing screen prompts for software selection and configuration.   The program loads the utilities and drivers, applies RAID settings, partitions the disk, and installs the desired operating system.

> **IMPORTANT:**   Express Setup is intended for the initial setup of the server system.   Therefore, it clears the contents of the hard disk.

For Microsoft Windows Server 2003 and Windows 2000, Express Setup automatically configures your server and installs the operating system.   After a few tasks are completed, all that remains to be done is to remove the NEC EXPRESSBUILDER CD-ROM and insert the Windows CD-ROM, input a product ID number, and acknowledge the license agreement.

For the other operating systems, Express Setup initializes the target disk(s), creates the maintenance partition, and installs the various maintenance utilities from the NEC EXPRESSBUILDER CD-ROM to lead your server to ready-to-install for the desired operating system.

Express Setup uses "Configuration Diskette".   The Configuration Diskette is a floppy disk that includes the configuration information for the server setup used in the automatic installation mode. Express Setup will perform all the process of the setup using the information in the floppy disk. During this procedure, you do not have to be in front of the Express server to confirm the state of the setup.   Also, using the same Configuration Diskette used before allows you to re-setup your server with the same condition as before.

Express Setup includes two types of installation method.

■ Quick start

Quick start uses the Configuration Diskette that the configuration parameters for server setup are pre-loaded before starting the Express Setup.   The configuration parameters are loaded by using the Configuration Diskette Creator (see Chapter 6).

■ Normal start

Normal start is to create the Configuration Diskette after starting the Express Setup.

NOTES:

■ Use the blank disk in the accessory box to create Configuration Diskette.

■ You can create Configuration Diskette in advance using "Configuration Diskette Creator" included in NEC EXPRESSBUILDER.

■ If you create Configuration Diskette in advance, you can abbreviate the items that is necessary to input or select during Express Setup.   (You can also create or modify the setup information restored in Configuration Diskette during Express Setup.)   If you have a computer other than your servers that is running with Windows 95/98/Me/XP, Windows NT 3.51 or later, or Windows 2000, Windows Server 2003, we recommend you to edit setup information from the computer in advance using Configuration Diskette Creator.

For more information on how to create Configuration Diskette using Configuration Diskette Creator, see Chapter 6.

Microsoft Windows Server 2003

This subsection provides information on installing Microsoft® Windows® Server 2003 in the server. Read instruction in this section before proceeding the installation.

> **NOTES:**
>
> - Express Setup does not support the installation of Windows Server x64 Editions.
>   If you want to install it, see Appendix D.
>
> - If you install Windows Server 2003 without using Express Setup, see Appendix E.

Installation Notice

This section explains precautions and matters you should be aware of before beginning installation in order to install Windows Server 2003 correctly.

Supported OS on this model

The server supports the following edition:

- Microsoft Windows Server 2003 Standard Edition (hereinafter, referred to as "Windows Server 2003")

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

Installing Optional Mass Storage Driver

To install optional mass storage driver, see "Installing Optional Mass Storage Driver" of "Configuration Diskette Creator" in Chapter 6 to create setup inf file.

BIOS Specification

Before installing Windows Server 2003, confirm if the BIOS specification of the hardware is correct. See Chapter 4 to specify them.

NEC ESMPRO Agent

On Windows Server 2003 systems, the ESMPRO Agent needs the necras.sys driver. To install the necras.sys, run the System update from NEC EXPRESSBUILDER CD-ROM.

Optional Board Supported by NEC EXPRESSBUILDER

- Supporting installation of OS in NEC EXPRESSBUILDER

  – N8103-65F SCSI Controller
  – N8103-75F SCSI Controller
  – N8103-95 SCSI Controller
  – N8103-78F Disk Array Controller (SATA)
  – N8103-80F Disk Array Controller (SCSI 1ch)
  – N8103-89 Disk Array Controller (SATA)
  – SATA HostRAID (Onboard Adaptec HostRAID controller)

- Other optional boards

  – N8103-56F SCSI Controller

Windows Server 2003

Express Setup can install Windows Server 2003 operating system.   However, note the following
issue:

> **IMPORTANT:**
>
> ■ Before starting the installation, complete all the process of adding
>   the optional device and the setup of Express server mainframe
>   (BIOS and optional board specification)
>
> ■ The document for installing Windows Server 2003 is also attached
>   to the other software package which is sold separately from NEC,
>   but refer to this document when you install Windows Server 2003
>   on this model.
>
> ■ After completing Express Setup, see "Setup for Solving Problems"
>   described later to specify the settings for trouble recovery such as
>   "Specifying Memory Dump".

Installing on the Mirrored Volume

If you want to install Windows Server 2003 on the volume that is mirrored using "Disk
Management", invalid the mirroring before operating the installation to set back to the basic disk,
and valid the mirroring again after the installation has completed.

Creating, invalid, delete mirror volume can be operated from "Disk Management" in "Computer
Management".

Connecting MO Device

If you operate installing Windows Server 2003 with MO device connected, the installation may not
be completed normally.   In such case, detach MO device and then re-install the system from the
beginning.

Media such as DAT

During the OS installation, do not attach the unnecessary media for OS installation to the system,
such as DAT.

Connecting Hard Disk Drive

Connect the hard disk drive that OS is not going to be installed after installing OS.

If you create multiple logical drives in your system, refer to "Re-installing the operation system
when multiple logical drives exist" (Appendix D).

Creating Partition Size

The size for the partition that the system is to be installed can be calculated from the following formula.

Size necessary to install the system + Paging File Size + Dump File Size
+ Application Size
Size necessary to install the system = 2900MB
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 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 512MB, the partition size will be calculated by the above formula as follows:

2900MB + (512MB * 1.5) + (512MB + 12MB) + Application Size
= 4192MB + Application Size

Re-installing to the hard disk which has been upgraded to Dynamic Disk

You cannot re-install Windows Server 2003 with the current partition of the hard disk upgraded to Dynamic Disk kept remained.

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

Disk Configuration (Concerning the area displayed as "EISA")

In disk area, an area displayed as "EISA" may exist.   This area is maintenance partition for saving configuration information and utilities.   Do not delete the area.

The Flow of Setup

This section visually describes the flow of the setup operated by Express Setup.
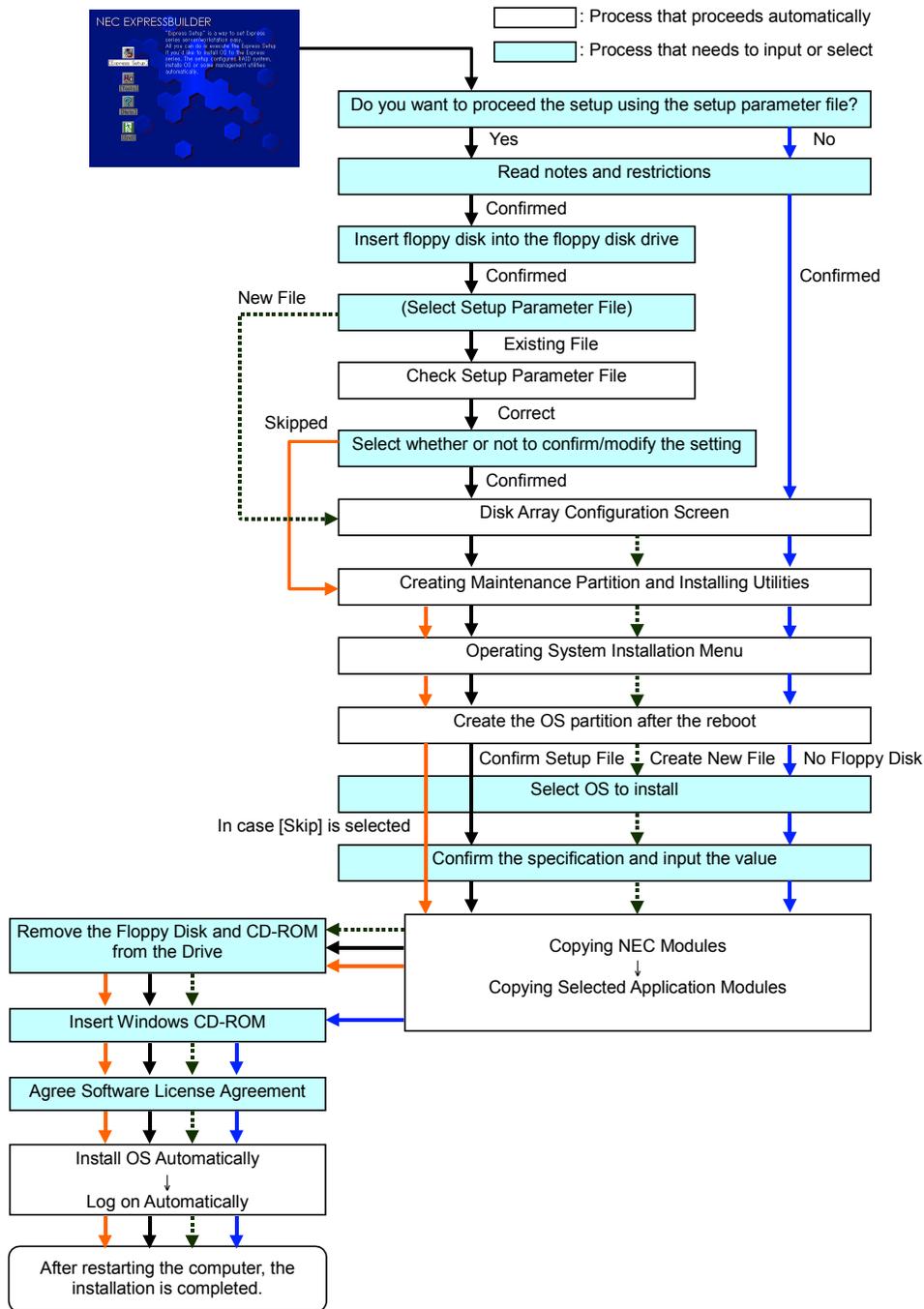
Installing the Windows Server 2003

Express Setup proceeds the setup by specifying the necessary information on the wizard. You can also save the setup information created on the wizard in a floppy disk as a setup file.

> **NOTE:** One floppy disk formatted by MS-DOS 1.44MB is necessary to save the setup information. Please prepare a floppy disk by yourself before the installation.
>
> Using the same setup file you saved and used before allows you to omit specifying the setup information on the wizard.
>
> And if you use a floppy disk which is attached to the optional device such as disk array controller and contains device driver to install optional mass storage driver while processing the Express Setup, you have to save the setup information in the setup file. Please prepare one empty floppy disk for setup file in this case, too.

1. Turn the power of peripheral device on, and then turn on the server.

> **NOTES:**
> ■ If you operate installing Windows Server 2003 with MO device connected, the installation may not be completed normally. In such case, detach MO device and then re-install the system from the beginning.
> ■ Connect the hard disk drive that OS is not going to be installed after installing OS.
> ■ If you create multiple logical drives in your system, refer to "Reinstalling the operation system when multiple logical drives exist" (Appendix D).

2. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM 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 CD-ROM and NEC EXPRESSBUILDER starts.

4. Click [Express Setup].

5. The message, "Do you want to use the parameter file in order to set up the Express Server or Workstation?", will be displayed.

If you use the setup parameter file, click [Yes] and if you do not use the setup parameter file, click [No].

6. "Note" will be displayed. Read the instruction carefully and click [Confirm].

7. Notes and restrictions are displayed.

Read the messages carefully and click [Confirm].

> **NOTE:** If some operating system has been installed on the hard disk already, the message which asks if you continue the installation appears.

If you wish to continue the installation, click [Continue].

8. If you select "Yes" at step 5, place a floppy disk into the floppy disk drive mounted on the server.

If not, go on the next step.

> **NOTE:** If you set the floppy disk at this step, do not remove the floppy disk from the server until the message as removing the floppy disk appears.

[Using the existing Configuration Disk]

The parameters files in the floppy disk is listed in dialog box.

1) Select a parameters file to use in the Express Setup and click [Use].

After the parameters file is specified, the message "Do you want to review or modify the Setup File parameters?" appears.

2) If you want to modify or confirm the parameters file, click [Review]. If not, click [Skip].

Click [Review] → Go on the next step.

Click [Skip] → Go on the step 10.

[Using a blank disk]

1) Click the box under [Setup File Name: (A)] or press **A**.

The dialog box appears.

2) Input the file name and click [Use].

9. Confirm or modify the parameters of disk array configuration.

[Configure RAID] screen appears. Confirm the specification, modify if necessary, and then click [OK].

> **NOTE:** Choose RAID0 when you install it in one hard disk.

When the dialog box is closed, the Express setup automatically performs the RAID configuration, creating Maintenance partition and installing several utilities.

10. Select the installing Operating system.

Select "Windows" from the menu.

11. Select the Windows family.

Select "Microsoft Windows Server 2003 Standard Edition Microsoft Windows Server 2003 Enterprise Edition" category.

> **NOTE:** If you select "Skip" at step 8, this menu does not appear.
> Go on the step 13.

12. Next, [Basic Information] wizard appears. Confirm the parameters, modify if necessary, and then click [Next].

After that, click [Next], [Back], or [Help] on the screen to continue. Modify the parameters each time if necessary.

> **IMPORTANT:**
>
> - Reserve the partition to install the OS more than the minimally required size.
>
> - If you select "Use Existing Array" at "New/Existing RAID Configuration", the information included in the first partition (excluding maintenance partition) will all be formatted and deleted. The information included in the other partition will be retained. In the figure below, describes the partition which information will be deleted when maintenance partition exists.
>
> | First Partition
<Maintenance Partition>
Retained | Second
Partition
Deleted | Third
Partition
Retained | Fourth
Partition
Retained |
> |---|---|---|---|
>
> - You can not re-install the system with the existing partition that is upgraded to Dynamic Disk remained.   Do not select "Use Existing Array" at "New/Existing RAID Configuration".
>
> - If you specify other than 4095MB for the "Installing Partition", it is necessary to convert to NTFS.
>
> - If "Use Existing Array" at "New/Existing RAID Configuration" is selected but the partition other than the one to install Windows Server 2003 does not exist (excluding maintenance partition), Express Setup will reserve the maximum area of the hard disk to install Windows Server 2003.
>
> - You can not go to the next screen if the specification is incorrect.
>
> - On specification, an error may occur in relationship with the specified contents of the former screen and require to go back to modify the specification.
>
> - During the setup, the screen to specify the partition that Windows Server 2003 is to be installed appears.   The first 55MB area displayed on the screen is a partition that is used to store the configuration information or utilities unique of the server.   We do not recommend to delete this area, but if you do not want to reserve this 55MB area, perform the installation by manual setup. It is unable to delete this area by Express Setup.

NOTES:

■ If you click [Cancel] in [Basic Information] screen, the screen will go back to select the OS. [Cancel] exists only in [Basic Information] screen.

■ If you click [OK] in [Role of Computer] screen, the setup automatically selects default value for the later specification to continue the installation.

13. Copy the modules for the optional mass storage driver.

If you want to install the optional mass storage driver, insert the floppy disk attached to mass storage driver into the floppy disk drive and follow the message to operate the installation.

NOTE: You can use this function only when the floppy disk drive is attached to the system.

14. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM 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 CD-ROM drive.

[Agree Software License Agreement] screen appears.

15. Read the contents carefully and click [I Agree.] or press **F8** if you do agree. If you do not agree, click [I Disagree] or press **F3**.

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.

Now the Setup using Express Setup has completed.

Installing and Setting Device Drivers

Follow these steps to install and configure the device drivers.

PROSet

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 CD-ROM into the CD-ROM drive.

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 "PROSET.EXE" in the following directory.

   CD-ROM DriveLetter:\WINNT\DOTNET\BC3\PROSET\WS03XP32

   The [Intel(R) PROSet - Install Shield Wizard] dialog starts.

4. Click [Next].

5. Choose "I accept the terms in the license agreement" and click [Next].

6. Choose "Typical" and click [Next].

7. Click [Install].

8. When [Install Shield Wizard Completed] window is displayed, click [Finish].

9. Restart the system.

Network Driver

Specify the details of network driver.

One standard network driver that is mounted will be installed automatically, but the link speed and Duplex mode need to be specified manually.

[When PROSet is not installed]

1. The [Local Area Connection Properties] dialog box appears.

    * The procedure in the case of the standard start menu

    1. Click Start menu, Click [Control Panel], Click [Network Connections], and Click [Local Area Connection].

    * The procedure in the case of the classic start menu

    1. Click Start menu, Click [Settings] and Click [Network Connections].

        The [Network Connections] dialog box appears.

    2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.

2. Click [Configure].

    The property dialog box for network adapter appears.

3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

4. Click [OK] on the property dialog box for network adapter.

[When PROSet is installed]

1. The [Intel(R) PROSet for Wired Connections] dialog box appears.

    * The procedure in the case of the standard start menu

    Click Start menu, point to [Control Panel] and click [Intel(R) PROSet Wired].

    * The procedure in the case of the classic start menu

    1. Click Start menu, point to [Settings] and click [Control Panel].

    2. Double-click [Intel(R) PROSet Wired] on the [Control Panel] window.

2. Click [(Network Adapter Name)] in the list.

3. Click the [Speed] and specify the [Link Speed & Duplex Settings] value the same as the value specified for HUB.

4. Click [Apply] and click [OK].

Also, add or delete any protocols and services if necessary.

You can operate the process on the property dialog box for local area network which can be appeared from [Network and Dial-up Connection].

> **NOTE:** We recommend you to add [Network Monitor] at [Adding Services]. [Network Monitor] can monitor the frame (or the packet) that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setting for Solving Problems" described later in this chapter.

Optional Network Board Driver

If you want to utilize optional Network Board (N8104-112/103/113), the network driver will be installed automatically. Therefore, the driver attached to the Network board should not be used.

If you want to utilize optional Network Board (N8104-86/111), install the driver stored in NEC EXPRESSBUILDER CD-ROM.

In case of utilizing　(N8104-86/111)

> "CD-ROM Drive Letter:\WINNT\DOTNET\BC3\PRO100\WS03XP32"

If the procedure of installation is not clear, refer to the installation procedure described in the section "Installation of the Optional Network Board Driver".

Installation of the Optional Network 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 check off the [Search removable media (floppy, CD-ROM...)] check box.

6. Check the [Include this location in the search] check box and when using [(N8104-86/111)], specify [CD-ROM driveletter:\WINNT\DOTNET\BC3\PRO100\WS03XP32]. Then click [Next].

7. Click [Finish].

Installing SCSI Controller Driver (N8103-65F/75)

If you utilize SCSI controller driver (N8103-65F/75), install it according to the following procedure:

1. Start [Device Manager] from [Start] menu → [Control Panel]→ [Administrative Tools] →[Computer Management].

2. Double-click the SCSI Controller driver which Device Manager lists as unknown device.

3. Click [Update Driver].

4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].

5. Select "Don't search. I will choose the driver to install" and click [Next].

6. Click [Have Disk..].

7. Insert "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, enter "a:\" into "copy manufacturer's file from:" and click [OK].

8. Specify the following driver and click [Next].

    –   [INITIO INI-A10XU2W PCI SCSI Controller]
        (When N8103-65F board is installed.)
    –   [Adaptec SCSI Card 29320ALP -Ultra320 SCSI]
        (When N8103-75 board is installed.)

The installation of the driver is completed.

Restart the system according to the message appeared on the screen.

Installing SCSI Controller Driver (N8103-56F/95)

If you utilize SCSI controller driver (N8103-56F/95), update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

The SCSI controller driver will be installed automatically.

Installing RAID Controller Driver (N8103-80F)

To additionally install the N8103-80F in a system containing Windows 2003, connect the controller and take the following steps to install the driver:

   1.   When the [Found New Hardware Wizard] dialog box appears, click [Next].

   2.   When the [Install Hardware Device Drivers] dialog box appears, select [Search for a suitable driver for my device (Recommended)], and click [Next].

   3.   When the [Locate Driver Files] dialog box appears, select [Floppy disk drives], insert "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, and click [Next].

   4.   When the [Driver Files Search Results] dialog box appears, click [Next].

   5.   Copying of the driver is completed, and the [Completion of the new hardware detection wizard] dialog box below appears. Click [Complete].

Available Switch Options for Windows Server 2003 Boot.ini File

Many different switches will be available if you edit Boot.ini file.

For the available switch options, refer to the following information:

- Microsoft Knowledge Base - Article ID: 833721

    "Available switch options for the Windows XP and the Windows Server 2003 Boot.ini files"

If your system has a memory capacity in excess of 4GB in its installing, adding /PAE switch in Boot.ini file will enable the system to be installed with over 4GB of memory.

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 - Aritcle ID: 291988

    "A description of the 4GB RAM tuning feature and the Physical Address Extension switch"

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].

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, Standard" /fastdetect
    multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003, Standard, 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 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 occur 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 restart the system in such case, memory dump may not be stored correctly.

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 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 [Recommended], 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 "Partition Size to be Created" described earlier.

■ In case the memory is expanded, re-specify the paging file to suit the new memory size.

■ To prepare for the situation when any trouble occurred, we recommend you to press dump switch to confirm that the dump will be collected normally in advance.

---

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.

Windows Dr. Watson

Windows 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 path.   Specify the path 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.   Check the following check box on the [Option] box.

   ☐ Dump Symbol Table
   ☐ Dump All Thread Contexts
   ☐ Add To Existing Log File
   ☐ Create Crash Dump File

   For more information on each function above, refer to Online Help.

6.   Click [OK].

Network Monitor

Utilizing Network Monitor helps you to investigate and manage with network trouble.   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/Remove Programs].

The [Add/Remove Programs] dialog box appears.

3. Click [Add/Remove Windows Component].

The [Windows Components Wizard] dialog box appears.

4. Check the [Management and Monitoring Tools] check box of the component ON and click [Next].

5. If the setup asks to install the disk, insert Windows Server 2003 CD-ROM into the CD-ROM drive and click [OK].

6. Click [Complete] in the [Windows Component Wizard] dialog box.

7. Click [Close] in the [Add/Remove Application] dialog box.

8. 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.

Installing Maintenance Utilities

Various maintenance utilities are contained in your NEC EXPRESSBUILDER CD-ROM. See Chapter 6 for installing the utilities to your server or management workstations.

Updating the System

Update the system in the situation below:

- Modified system configuration.
- Recovered the system using recovery process.

Log on to the system with the account that has administrative authority (e.g. Administrator) and insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.

[Setup Software] in [Master Control Menu] screen appears, so left-click the item.   Click [Update the System] from the menu and the setup will start.   After that, follow the message to continue the setup 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. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive and reboot the system.

2. Select [Tools].

3. Select [Off-line Maintenance Utility].

4. Select [System Information Management].

5. Insert a floppy disk into the floppy disk drive.

6. Select [Save].

Exceptional Setup

This section explains how to setup with the exceptional way. 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 ExpressSetup

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 disk array controller, configure the RAID system before running the NEC EXPRESSBUILDER.

3. Boot the system from the NEC EXPRESSBUILDER CD-ROM.

4. (a) When the dialog of Disk array configuration appears, check "Use Existing Array".

(b) Check "Apply OEM-FD for Mass storage device".

5. Copy the driver for the mass storage device in the ExpressSetup.

Insert the floppy disk attached the mass storage device into the floppy disk drive.

Continue the ExpressSetup, referring to messages displayed on the display.

Microsoft Windows 2000

This subsection provides information on installing Microsoft® Windows® 2000 in the server. Read instruction in this section before proceeding the installation.

> **NOTE:** If you install Windows 2000 without using Express Setup, see Appendix D.

Installation Notice

This section explains precautions and matters you should be aware of before beginning installation in order to install Windows 2000 correctly.

Supported OS on this model

The server supports the following edition:

- Microsoft Windows 2000 Server (hereinafter, referred to as "Windows 2000")

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

Installing Optional Mass Storage Driver

To install optional mass storage driver, see "Installing Optional Mass Storage Driver" of "Configuration Diskette Creator" in Chapter 6 to create setup inf file.

BIOS Specification

Before installing Windows 2000, confirm if the BIOS specification of the hardware is correct.   On BIOS specification, there are some items to specify for the new functions provided from Windows 2000 (Plug and Play, support for USB interface and so on).   See Chapter 4 to specify them.

NEC ESMPRO Agent

On Windows 2000 systems, the ESMPRO Agent needs the necras.sys driver. To install the necras.sys, run the System update from NEC EXPRESSBUILDER CD-ROM.

Optional Board Supported by NEC EXPRESSBUILDER

- Supporting installation of OS in NEC EXPRESSBUILDER
  - N8103-75F SCSI Controller
  - N8103-78F Disk Array Controller (SATA)
  - N8103-80F Disk Array Controller (SCSI 1ch)
  - N8103-89 Disk Array Controller
  - SATA HostRAID (Onboard Adaptec HostRAID controller)
- Other optional boards
  - N8103-56F SCSI Controller
  - N8103-65F SCSI Controller
  - N8103-95 SCSI Controller

Windows 2000

Express Setup can install Windows 2000 operating system.   However, note the following issue:

> **IMPORTANT:**
>
> - Before starting the installation, complete all the process of adding the optional device and the setup of Express server mainframe (BIOS and optional board specification)
>
> - The document for installing Windows 2000 is also attached to the other software package which is sold separately from NEC, but refer to this document when you install Windows 2000 on this model.
>
> - After completing Express Setup, see "Setup for Solving Problems" described later to specify the settings for trouble recovery such as "Specifying Memory Dump".

Installing on the Mirrored Volume

If you want to install Windows 2000 on the volume that is mirrored using "Disk Management", invalid the mirroring before operating the installation to set back to the basic disk, and valid the mirroring again after the installation has completed.

Creating, invalid, delete mirror volume can be operated from "Disk Management" in "Computer Management".

Connecting MO Device

If you operate installing Windows 2000 with MO device connected, the installation may not be completed normally.   In such case, detach MO device and then re-install the system from the beginning.

Media such as DAT

During the OS installation, do not attach the unnecessary media for OS installation to the system, such as DAT.

Connecting Hard Disk Drive

Connect the hard disk that OS is not going to be installed after installing OS.

If you create multiple logical drives in your system, refer to "Re-installing the operation system when multiple logical drives exist" (Appendix E).

Disk Configuration (Concerning the area displayed as "MAINTE_P")

In disk area, an area displayed as "MAINTE_P" may exist.   This area is maintenance partition for saving configuration information and utilities.   Do not delete the area.

Creating Partition Size

The size for the partition that the system is to be installed can be calculated from the following formula.

Size necessary to install the system + Paging File Size + Dump File Size
                                      + Application Size

Size necessary to install the system	= 1000MB
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 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 512MB, the partition size will be calculated by the above formula as follows:

1000MB + (512MB * 1.5) + (512MB + 12MB) + Application Size
= 2292MB + Application Size

> **NOTES:**
>
> If you want to install using Express Setup, calculate the minimally required partition size as follows:
>
> ■ If you do not apply Windows 2000 Service Pack
> The larger value of either one: 'Minimum Partition Size' described above, or '4095MB'.
>
> ■ If you want to apply Windows 2000 Service Pack
> The larger value of either one: 'Minimum Partition Size' described above + 850MB or '4095MB'.

Re-installing to the hard disk which has been upgraded to Dynamic Disk

You cannot re-install Windows 2000 with the current partition of the hard disk upgraded to Dynamic Disk kept remained.

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

The Flow of Setup

This section visually describes the flow of the setup operated by Express Setup.

: Process that proceeds automatically

: Process that needs to input or select

Do you want to proceed the setup using the setup parameter file?

Yes   No

Read notes and restrictions

Confirmed

Insert floppy disk into the floppy disk drive

Confirmed   Confirmed

New File

(Select Setup Parameter File)

Existing File

Check Setup Parameter File

Correct

Skipped

Select whether or not to confirm/modify the setting

Confirmed

Disk Array Configuration Screen

Creating Maintenance Partition and Installing Utilities

Operating System Installation Menu

Create the OS partition after the reboot

Confirm Setup File   Create New File   No Floppy Disk

Select OS to install

In case [Skip] is selected

Confirm the specification and input the value

Remove the Floppy Disk and CD-ROM from the Drive

Copying NEC Modules
↓
Copying Selected Application Modules

Insert Windows CD-ROM

Agree Software License Agreement

Insert SP CD-ROM
(If you selected [Apply] on [Apply Service Pack].)

Install OS Automatically
↓
Log on Automatically

After restarting the computer, the installation is completed.

Installing the Windows 2000

Express Setup proceeds the setup by specifying the necessary information on the wizard. You can also save the setup information created on the wizard in a floppy disk as a setup file.

> **NOTE:** One floppy disk formatted by MS-DOS 1.44MB is necessary to save the setup information. Please prepare a floppy disk by yourself before the installation.

Using the same setup file you saved and used before allows you to omit specifying the setup information on the wizard.

And if you use a floppy disk which is attached to the optional device such as disk array controller and contains device driver to install optional mass storage driver while processing the Express Setup, you have to save the setup information in the setup file. Please prepare one empty floppy disk for setup file in this case, too.

1. Turn the power of peripheral device on, and then turn on the server.

> **NOTES:**
>
> - If you operate installing Windows 2000 with MO device connected, the installation may not be completed normally. In such case, detach MO device and then re-install the system from the beginning.
>
> - Connect the hard disk drive that OS is not going to be installed after installing OS.
>
> - If you create multiple logical drives in your system, refer to "Reinstalling the operation system when multiple logical drives exist" (Appendix D).

2. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM 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 CD-ROM and the NEC EXPRESSBUILDER starts.

4. Click [Express Setup].

5. The message, "Do you want to use the parameter file in order to set up the Express Server or Workstation?", will be displayed.

If you use the setup parameter file, click [Yes] and if you do not use the setup parameter file, click [No].

6. "Note" will be displayed. Read the instruction carefully and click [Confirm].

7. Notes and restrictions are displayed.

Read the messages carefully and click [Confirm].

> **NOTE:** If some oparating system has been installed on the hard disk already, the message which asks if you continue the installation appears.

If you wish to continue the installation, click [Continue].

8. If you select "Yes" at step 5, place a floppy disk into the floppy disk drive mounted on the server.

If not, go on the next step.

> **NOTE:** If you set the floppy disk at this step, do not remove the floppy disk from the server until the message as removing the floppy disk appears.

[Using the existing Configuration Disk]

The parameters files in the floppy disk is listed in dialog box.

1) Select a parameters file to use in the Express Setup and click [Use].

   After the parameters file is specified, the message "Do you want to review or modify the Setup File parameters?" appears.

2) If you want to modify or confirm the parameters file, click [Review]. If not, click [Skip].

   Click [Review] → Go on the next step.

   Click [Skip] → Go on the step 10.

[Using a blank disk]

1) Click the box under [Setup File Name: (A)] or press **A**.

   The dialog box appears.

2) Input the file name and click [Use].

9. Confirm or modify the parameters of disk array configuration.

[Configure RAID] screen appears. Confirm the specification, modify if necessary, and then click [OK].

> **NOTE:** Choose RAID0 when you install it in one hard disk.

When the dialog box is closed, the Express setup automatically performs the RAID configuration, creating Maintenance partition and installing several utilities.

10. Select the installing Operating system.

Select "Windows" from the menu.

11. Select the Windows family.

Select "Microsoft Windows 2000 Server Microsoft Windows 2000 Advanced Server" category.

> **NOTE:** If you select "Skip" at step 8, this menu does not appear.
> Go on the step 13.

12. Next, [Basic Information] wizard appears. Confirm the parameters, modify if necessary, and then click [Next].

After that, click [Next], [Back], or [Help] on the screen to continue. Modify the parameters each time if necessary.

> **IMPORTANT:**
>
> - Reserve the partition to install the OS more than the minimally required size.
>
> - If you select "Use Existing Array" at "New/Existing RAID Configuration", the information included in the first partition (excluding maintenance partition) will all be formatted and deleted. The information included in the other partition will be retained. In the figure below, describes the partition which information will be deleted when maintenance partition exists.
>
> | First Partition
<Maintenance Partition>
Retained | Second
Partition
Deleted | Third
Partition
Retained | Fourth
Partition
Retained |
> |---|---|---|---|
>
> - You can not re-install the system with the existing partition that is upgraded to Dynamic Disk remained.   Do not select "Use Existing Array" at "New/Existing RAID Configuration".
>
> - If "Create New Partition" at "New/Existing RAID Configuration" is selected, do not specify the value for the partition more than the actual area size.
>
> - If you specify other than 4095MB for the "Installing Partition", it is necessary to convert to NTFS.
>
> - If "Use Existing Array" at "New/Existing RAID Configuration" is selected but the partition other than the one to install Windows 2000 does not exist (excluding maintenance partition), Express Setup will reserve the maximum area of the hard disk to install Windows 2000.

IMPORTANT:

■ You can not go to the next screen if the specification is incorrect.

■ On specification, an error may occur in relationship with the specified contents of the former screen and require to go back to modify the specification.

■ During the setup, the screen to specify the partition that Windows 2000 is to be installed appears. The first 55MB area displayed on the screen is a partition that is used to store the configuration information or utilities unique of the server. We do not recommend to delete this area, but if you do not want to reserve this 55MB area, perform the installation by manual setup. It is unable to delete this area by Express Setup.

NOTES:

■ If you click [Cancel] in [Basic Information] screen, the screen will go back to select the OS. [Cancel] exists only in [Basic Information] screen.

■ If you click [OK] in [Role of Computer] screen, the setup automatically selects default value for the later specification to continue the installation.

13. Copy the modules for the optional mass storage driver.

If you want to install the optional mass storage driver, insert the floppy disk attached to mass storage driver into the floppy disk drive and follow the message to operate the installation.

NOTE: You can use this function only when the floppy disk drive is attached to the system.

14. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM 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 CD-ROM drive.

[Agree Software License Agreement] screen appears.

15. Read the contents carefully and click [I Agree.] or press **F8** if you do agree. If you do not agree, click [I Disagree] or press **F3**.

> **IMPORTANT:**
>
> - If you do not agree to this agreement, the setup terminates and Windows 2000 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.

16. If you selected [Yes] on [Apply Service Pack] at Basic Information, follow the procedure below.

1) Follow the message to take Windows 2000 CD-ROM out of the CD-ROM drive.

2) Follow the message to insert Windows 2000 Service Pack 4 or later into the CD-ROM drive.

Windows 2000 and the specified application will be installed automatically and logon to the system.   Install and configure the device drivers.

Now the Setup using Express Setup has completed.

Installing and Setting Device Drivers

Follow these steps to install and configure the device drivers.

PROSet

PROSet is a utility that confirms the function of network contained in network driver. Be sure to install. Utilizing PROSet enables the following issues:

- Confirm detailed information of the adapter.

- Diagnose loop back test, packet transmission test and so on.

- Specify teaming.

Configuring several network adapters as one team provides the server an environment tolerant 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 CD-ROM into the CD-ROM drive.

2. Click Start menu, point to [Program], [Accessory] and click [Explorer].

3. Run "PROSET.EXE" in the following directory.

   <CD-ROM Drive Letter>:\WINNT\W2K\BC3\PROSET\WIN2K

   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. Choose "Typical" and click [Next].

7. Click [Install].

8. When [InstallShield Wizard Completed] window is displayed, click [Finish].

9. Restart the system.

Network Driver

[When PROSet is not installed]

1. Click Start menu and click [Network and Dial-Up Connection].

The [Network and Dial-Up Connection] dialog box appears.

2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.

The [Local Area Connection Properties] dialog box appears.

3. Click [Configure].

The property dialog box for network adapter appears.

4. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

5. Click [OK] on the property dialog box for network adapter.

6. Click [OK] on the [Local Area Connection Properties] dialog box.

Also, add or delete any protocols and services if necessary. You can operate the process from [Network and Dial-up Connection] to display the property dialog box for local area network.

> **NOTE:** We recommend you to add [Network Monitor] at [AddingServices]. [Network Monitor] can monitor the frame (or the packet) that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setting for Solving Problems" described later in this chapter.

[When PROSet is installed]

1. Double-click [Intel(R) PROSet Wired] on the [Control Panel] window.

The [Intel(R) PROSet for Wired Connections] dialog box appears. Double-click the [Intel(R) PROSet Wired] icon.

2. Put the cursor to the network driver in the list.

3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

Also specify the other network driver with the same progress above.

Optional Network Board Driver

If you want to utilize optional Network Board (N8104-112/111/86/103/113), install the driver stored in NEC EXPRESSBUILDER CD-ROM.

Refer to the re-installation procedure described in Appendix E.

>Network Driver for (N8104-86/111)
>
>[CD-ROM Drive Letter:\WINNT\W2K\BC3\PRO100\WIN2K]
>
>Network Driver for (N8104-112/103/113)
>
>[CD-ROM Drive Letter:\WINNT\W2K\BC3\PRO1000\WIN2K]

Graphics Accelerator Driver

Standard graphics accelerator drivers that are mounted will be installed automatically.

The following is the procedure when it is necessary to install manually.

If you want to utilize optional Graphics Accelerator Driver board, follow the document attached to the board to install the driver.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "SETUP.EXE" in the following directory.

   <CD-ROM Drive Letter>:\WINNT\W2K\VIDEO\SETUP.EXE
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 CD-ROM from the CD-ROM drive, follow the direction on the screen and restart the system.

USB 2.0 Driver

USB 2.0 Driver is pre-installed.

When restoring the system or re-installing the system, the driver is automatically installed in the process of updating the system.

Installing SCSI Controller Driver (N8103-65F/75)

If you utilize SCSI controller driver (N8103-65F/75), install it according to the following procedure:

1. Start [Device Manager] from [Start] menu → [Control Panel]→ [Administrative Tools] →[Computer Management].

2. Double-click the SCSI Controller driver which Device Manager lists as unknown device.

3. Click [Update Driver].

4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].

5. Select "Don't search. I will choose the driver to install" and click [Next].

6. Click [Have Disk..].

7. Insert "Windows 2000 OEM-DISK for EXPRESSBUILDER" into the floppy disk drive, enter "a:\" into "copy manufacturer's file from:" and click [OK].

8. Specify the following driver and click [Next].

   – [INITIO INI-A10XU2W PCI SCSI Controller]
     (When N8103-65F board is installed.)
   – [Adaptec Ultra320 SCSI Cards (Win2000]
     (When N8103-75 board is installed.)

The installation of the driver is completed.
Restart the system according to the message appeared on the screen.

Installing SCSI Controller Driver (N8103-56F/95)

If you utilize SCSI controller driver (N8103-56F/95), update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

The SCSI controller driver will be installed automatically.

Installing RAID Controller Driver (N8103-80F)

To additionally install the N8103-80F in a system containing Windows 2000, connect the controller and take the following steps to install the driver:

1. When the [Found New Hardware Wizard] dialog box appears, click [Next].

2. When the [Install Hardware Device Drivers] dialog box appears, select [Search for a suitable driver for my device (Recommended)], and click [Next].

3. When the [Locate Driver Files] dialog box appears, select [Floppy disk drives], insert "Windows 2000 OEM-DISK for EXPRESSBUILDER" into the floppy disk drive, and click [Next].

4. When the [Driver Files Search Results] dialog box appears, click [Next].

5. Copying of the driver is completed, and the [Completion of the new hardware detection wizard] dialog box below appears. Click [Complete].

Available Switch Options for Windows 2000 Boot.ini File

Many different switches will be available if you edit Boot.ini File.

For the available switch options, refer to the following information:

- Microsoft Knowledge Base - Article ID: 170756

  "Available Switch Options for the Windows NT Boot.ini File"

If your system has a memory capacity in excess of 4GB in its installing, adding /PAE switch in Boot.ini file will enable the system to be installed with over 4GB of memory.

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 - Aritcle ID: 291988

  "A description of the 4GB RAM tuning feature and the Physical Address Extension switch"

Below is the example on how to add /PAE switch to Boot.ini file.

1. Click [Start], point to [Programs], point to [Accessories], and then click [Notepad].

2. On the [File] menu, click [Open...].

3. In the [Open] dialog box, in the [Look in] drop-down list box, click "%systemroot%" drive.

4. In the [Open] dialog box, in the [Files of type] drop-down list box, click "All Files" and in the [File name] drop-down list box, enter "Boot.ini". And then, click [Open].

   The content of Boot.ini file will be displayed.

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(1)\WINNT
   [operating systems]
   multi(0)disk(0)rdisk(0)partition(1)\WINNT="Windows 2000 Server" /fastdetect
   multi(0)disk(0)rdisk(0)partition(1)\WINNT="Windows 2000 Server, PAE" /fastdetect /PAE
   ```

   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 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 occur 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.

Follow the procedure below to specify.

1. Point to [Settings] in Start menu and click [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click [System].

   The [System Properties] dialog box appears.

3. Click [Advanced].

4. Click [Startup and Recovery].

5. Enter the location to write the debug information to the text box.

   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 + 12MB".
> - 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.

6. Click [Performance Options].

7. Click [Change] on the [Virtual Memory] dialog box.

8. Modify [Initial Size] in the [Paging File Size for Selected Drive] box to the value larger than [Recommended Size], and click [Specify].

> **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 "Partition Size to be Created" described earlier.
> - In case the memory is expanded, re-specify the paging file to suit the new memory size.
> - To prepare for the situation when any trouble occurred, we recommend you to press dump switch to confirm that the dump will be collected normally in advance.

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.

Windows 2000 Dr. Watson

Windows 2000 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 2000] 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 path.   Specify the path 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.   Check the following check box on the [Option] box.

☐ Dump Symbol Table
☐ Dump All Thread Contexts
☐ Add To Existing Log File
☐ Create Crash Dump File

For more information on each function above, refer to Online Help.

6.   Click [OK].

Network Monitor

Utilizing Network Monitor helps you to investigate and manage with network trouble.   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/Remove Programs].

    The [Add/Remove Programs] dialog box appears.

3. Click [Add/Remove Windows Component].

    The [Windows Components Wizard] dialog box appears.

4. Check the [Management and Monitoring Tools] check box of the component ON and click [Next].

5. If the setup asks to install the disk, insert Windows 2000 CD-ROM into the CD-ROM drive and click [OK].

6. Click [Complete] in the [Windows Component Wizard] dialog box.

7. Click [Close] in the [Add/Remove Application] dialog box.

8. 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.

Installing Maintenance Utilities

Various maintenance utilities are contained in your NEC EXPRESSBUILDER CD-ROM. See Chapter 6 for installing the utilities to your server or management workstations.

Updating the System - Installing Service Pack -

> **IMPORTANT:** Without applying Service Pack and applying Service Pack 1, 2, or 3 to this system are not supported. If you install Windows 2000 CD-ROM which contains ServicePack 4 to your system, you do not have to apply Service Pack 4 again.

Update the system in the situation below:

- Modified system configuration.
- Recovered the system using recovery process.

Log on to the system with the account that has administrative authority (e.g. Administrator) and insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.

[Setup Software] in [Master Control Menu] screen appears, so left-click the item.   Click [Update the System] from the menu and the setup will start.   After that, follow the message to continue the setup process and apply Service Pack.

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. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive and reboot the system.

2. Select [Tools].

3. Select [Off-line Maintenance Utility].

4. Select [System Information Management].

5. Insert a floppy disk into the floppy disk drive.

6. Select [Save].

Exceptional Setup

This section explains how to setup with the exceptional way. 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 ExpressSetup

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 disk array controller, configure the RAID system before running the NEC EXPRESSBUILDER.

3. Boot the system from the NEC EXPRESSBUILDER CD-ROM.

4. (a) When the dialog of Disk array configuration appears, check "Use Existing Array".

    (b) Check "Apply OEM-FD for Mass storage device".

5. Copy the driver for the mass storage device in the ExpressSetup.

    Insert the floppy disk attached the mass storage device into the floppy disk drive.

    Continue the ExpressSetup, referring to messages displayed on the display.

HostRAID

The following explains the overview of HostRAID and the setup procedure.

Overview of HostRAID

HostRAID provides RAID feature through the onboard serial ATA interface in your system.

HostRAID consists of the driver that controls disk arrays and "Adaptec Storage Manager™ - Browser Edition" (hereinafter referred to as "ASMBE") that is a disk array management utility.

The software products are mandatory for HostRAID to function normally.   Be sure to install both software products.   For the driver, refer to the setup procedure explained in this manual.   For ASMBE, refer to the "Adaptec Storage Manager™ - Browser Edition User's Guide."

Overview of the specifications

Hard disk drive:	One hard disk drive for each channel (two hard disk drives max.)
RAID level:	RAID0 or RAID1
Operating system:	Microsoft Windows Server 2003 Standard Edition/ Enterprise Edition Microsoft Windows Server 2003 x64 Editions Microsoft Windows 2000 Server/Advanced Server
Configuration Method of disk arrays:	BIOS setup utility, NEC EXPRESSBUILDER and ASMBE

Features

- HostRAID enables the BIOS utility to select the disk array/standard SATA for each channel.

- Since the JAVA-based management utility ASMBE uses the browser (IE5.5 or later), the software does not need to be installed into each client PC for management. (The software must be installed in each server.)

Notes

The following explains general notes on HostRAID:

For notes on the BIOS setup utility, refer to Chapter 4 of this manual. For notes on ASMBE, refer to Adaptec Storage Manager™ - Browser Edition User's Guide.

> **NOTE:** You may view or print the Adaptec Storage Manager™ - Browser Edition User's Guide from the NEC EXPRESSBUILDER CD-ROM.

- Only use the HostRAID drive as a system drive.

- Only a hard disk drive can be connected to a channel with which HostRAID is enabled through the BIOS setup utility.

- To connect a device other than a hard disk drive, disable HostRAID and use it as the standard SATA.

- In addition to driver installation, ASMBE installation is mandatory for using HostRAID functions. For the installation of ASMBE, refer to the "Adaptec Storage Manager™ - Browser Edition User's Guide."

- If you replace a hard disk drive being used with HostRAID, please replace the hard disk drive after power-off of the system. Be sure to check the PORT number of the hard disk drive to be replaced in ASMBE in advance.

- HostRAID does not permit the use of the standby/hibernation mode of ACPI functions.

- Use ASMBE to maintain HostRAID, but do not use any other utilities.

- If the following messages are included in the application log or log generated by the ASMBE, your RAID system operates normally.

  - Spare test failed for pool spare (bus=%2, ch=%3, id=%4)

  - Test of all spares completed with %1 failures

HostRAID Setup Flow

The flowchart below shows the HostRAID system setup procedure.

```
                    ┌─────────────────────────┐
                    │          Start          │
                    └─────────────────────────┘
                                 │
                                 ▼
                    ┌─────────────────────────┐
                    │   Enable the HostRAID    │
                    │ feature and create RAID by│
                    │  using BIOS setup utility │
                    └─────────────────────────┘
                           Refer to Chapter 4*1.
                                 │
                                 ▼
                    ┌─────────────────────────┐
                    │      Install driver      │
                    │       (install OS).      │
                    └─────────────────────────┘
                          See Appendix D or E of
                          this guide.
                                 │
                                 ▼
                    ┌─────────────────────────┐
                    │      Update system.      │
                    └─────────────────────────┘
                          See this chapter.
                                 │
                                 ▼
                    ┌─────────────────────────┐
                    │      Install ASMBE.      │
                    └─────────────────────────┘
                          See ASMBE User's
                          Guide*2.
                                 │
                                 ▼
            ┌───────────────────────────────────┐
            │   Install Standby/Hibernation     │
            │          Lock driver.             │
            └───────────────────────────────────┘
                          See appendix of ASMBE
                          User's Guide*2.
                                 │
                                 │
                                 ▼
                    ┌─────────────────────────┐
                    │           End           │
                    └─────────────────────────┘
```
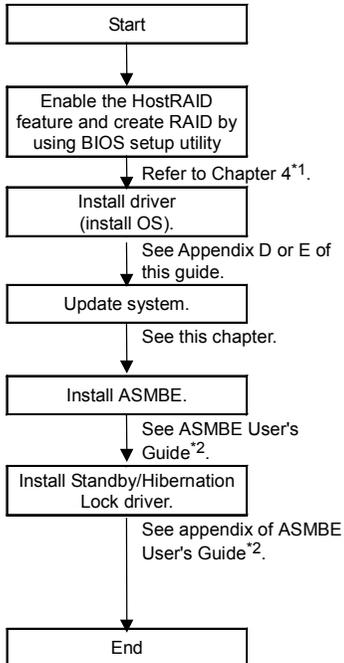
*1   You can create RAID by using the NEC EXPRESSBUILDER. In this case, only you need to do is to set the
     HostRAID feature to "Enabled" by using BIOS setup utility.
*2   ASMBE User's Guide: Adaptec Storage Manager™ - Browser Edition User's Guide.

You may view or print the Adaptec Storage Manager™ - Browser Edition User's Guide from the
NEC EXPRESSBUILDER CD-ROM.

(This page is intentionally left blank.)

Chapter 6

Installing and Using Utilities

This section describes how to use the NEC EXPRESSBUILDER CD-ROM that comes with your server and to install the utilities stored on the NEC EXPRESSBUILDER.

NEC EXPRESSBUILDER

NEC EXPRESSBUILDER is an automated software integration tool to help simplify the process of installing and configuring your server. Shipped with all NEC servers, the NEC EXPRESSBUILDER CD-ROM provides a flexible, guided installation process for system administrators to install Microsoft Windows Server 2003, Microsoft Windows 2000 or other operating systems (contact your service representative for the server certified operating systems).

> **NOTE:** Before using NEC EXPRESSBUILDER for initial setup, complete the hardware configuration.

NEC EXPRESSBUILDER includes two distinct programs.   One can be booted under DOS for initial setup, and one is for use under Windows operating system.

- DOS-based with local console

    Used to set up the server at the first time.   This program is also used to diagnose the server and to install/uninstall the management utilities on the maintenance partition of the system drive.

■ Windows-based

This program is called as "Master Control Menu" that can run under the Microsoft Windows system (Windows 95 or later and Windows NT 4.0 or later).   You can install the several applications and read the documentation from the menu.
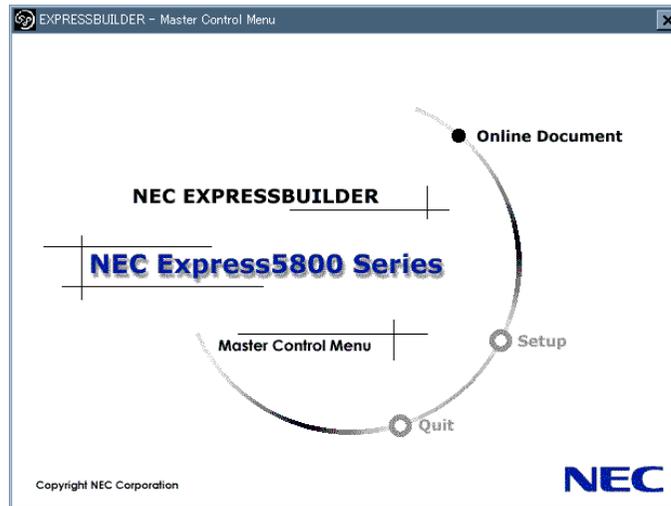
NEC EXPRESSBUILDER for DOS-Based with Local Console

This subsection describes the procedures for using NEC EXPRESSBUILDER for DOS-based with local console.

Starting NEC EXPRESSBUILDER

The following procedure instructs you to start NEC EXPRESSBUILDER.

> **IMPORTANT:**   Do not remove the NEC EXPRESSBUILDER CD-ROM while NEC EXPRESSBUILDER is running.

1. Turn on peripheral devices and the server in this order.

2. Insert the NEC EXPRESSBUILDER CD-ROM supplied with your server into the CD-ROM drive of your server.

3. Ensure that the floppy disk drive is empty.

4. 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.)

    NEC EXPRESSBUILDER boots up displaying the top menu.
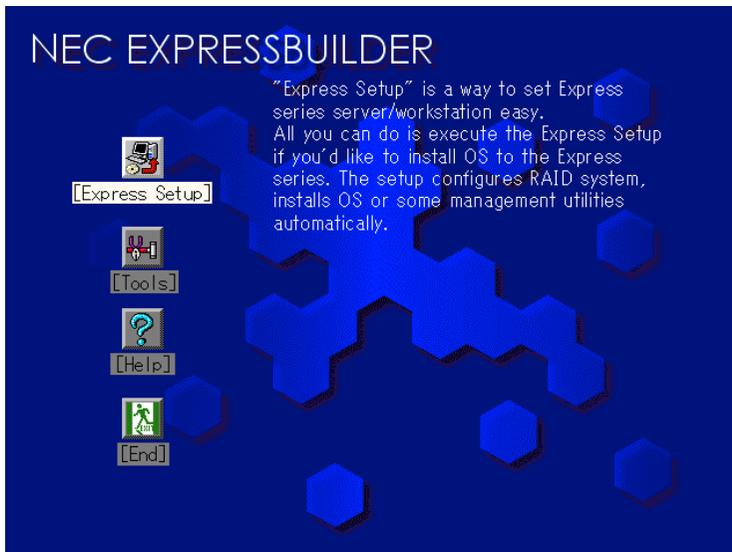
Express Setup

"Express Setup" is intended for initial setup of the server.   Its automatic installation mode guides the user easily through the process by detailing specific hardware features and providing screen prompts for software selection and configuration.   The program loads the utilities and drivers, applies RAID settings, partitions the disk, and installs the desired operating system.

If you install Windows Server 2003 or Windows 2000, after a few tasks are completed, all that remains to be done is to remove the NEC EXPRESSBUILDER CD-ROM and install the Windows CD-ROM, input a product ID number, and acknowledge the license agreement.

> **IMPORTANT:**
>
> - The Express Setup is intended for the initial setup of the server system and, therefore, the Express Setup clears the contents of the hard disk.
>
> - Once Express setup is started, do not remove "Configuration Diskette" from the floppy disk drive without any directions.

Tools

"Tools" is also intended for initial setup of the server.   It provides more installation options than Express Setup and permits the user to quickly create utility support disks, run the Off-line Maintenance Utility and system diagnostic utility, set up a maintenance partition, and update the various BIOS programs.

```
Tools Menu                                    RAID Board: Present
                                              Total Drives: 1
Save/Restore RAID Configuration Data          Drives in Group: 1
Off-line Maintenance Utility                  Hot Spares: 1
System Diagnostics                            RAID Level: 7
Create Support Disk                           Write Mode: WRITE_THRU
Setup Maintenance Partition                   Maint Part: Present
BIOS/FW/etc. Update
Help
Return to the Top Menu
```

- Save/Restore RAID Configuration Data

    The item allows the configuration information on the disk array system to be saved or restored from the floppy disk.

    – Save Disk Array Configuration Data

    The configuration information on the disk mirroring controller is saved into the floppy disk. If you set or change RAID, always use this function to save the configuration information into the floppy disk.

    > **IMPORTANT:** Some Disk Array Controllers do not support this function.   In that case, this menu will not be shown.

– Restore Disk Array Configuration Data

The configuration information saved in a floppy disk is restored to NVRAM and hard disk on the disk mirroring controller.

If the configuration information is broken or changed by mistake, restore the configuration information.

When the defected disk array controller is replaced, the configuration information on the hard disk must be saved into the disk array controller.

However, if the configuration information on the new disk mirroring controller is saved into a hard disk, use this function to restore the configuration information.

> **IMPORTANT:**
> - Some Disk Array Controllers do not support this function.   In that case, this menu will not be shown.
> - This is a function for maintenance. Please do not use it except maintenance.

- Off-line Maintenance Utility

Off-line Maintenance Utility is an OS-independent maintenance program that performs preventive maintenance and error analysis for your server.   See Chapter 8 or online help for details.

- System Diagnostics

Executes 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 System Diagnostics is executed, a system check program assigned to each model starts.   See Chapter 7 for details.

- Create Support Disk

NEC EXPRESSBUILDER CD-ROM contains a number of device drivers and utilities that you can put on floppy disks and load onto your system.

Using this menu creates a support disk by copying from the NEC EXPRESSBUILDER CD-ROM.   If your system has the Windows operating system, you may find it more convenient to use NEC EXPRESSBUILDER for Windows-based to make support disks.

Write the displayed title on the floppy disk label, which is useful for management in the future.   Customers are to provide a floppy disk to create a support disk.

– Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER

Creates a support disk for installing Windows Server 2003 x64 Editions.

– Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER

Creates a support disk for installing Windows Server 2003 Standard Edition. (No need to create this disk when installing the operating system with the Express Setup.)

– Windows 2000 OEM-DISK for NEC EXPRESSBUILDER

Creates a support disk for installing Windows 2000 Server. (This disk is utilized for Windows 2000 clean installation and for Recovery for Windows 2000 system.) (No need when installing the operating system with the Express Setup.)

– ROM-DOS Startup FD

Creates a support disk for starting the ROM-DOS system.

– Off-line Maintenance Utility Bootable FD

Creates a support disk for activating the Off-line Maintenance Utility.

■ Setup Maintenance Partition

Maintenance partition is a specific partition for the server and created on your system disk. About 55MB of the maintenance partition includes the various maintenance utilities and executable commands.

In this menu, you can create the maintenance partition, install the various utilities, and update the utilities.   The maintenance utilities installed in the maintenance partition are system diagnostics and Off-line Maintenance Utility.

IMPORTANT:

■ Do not reset or turn off the server while the running this menu.   If the processing is discontinued, the system becomes unable to start.

■ The existence of the maintenance partition may be identified from the operating system.   In order to retain the Configuration Data, do not delete the partition.

NOTES:

■ The maintenance partition, once created, will not be recreated again.

■ When the maintenance partition does not exist, some menu items do not appear.

– Create Maintenance Partition

NEC EXPRESSBUILDER creates about 55MB of the maintenance partition on the system disk (or disk array system) as work area.   The various utilities are installed when the maintenance partition is created successfully or when the maintenance partition is already created.

– Install Maintenance Partition Utilities

Various utilities are installed in the maintenance partition from the CD-ROM.

– Update Maintenance Partition Utilities

Various utilities are copied in the Maintenance Partition from the update disk.   This menu is only used when the update disk is supplied from your service representative or attached with your system.

– FDISK

Execute FDISK command of ROM-DOS system.   You can create/delete partitions, etc.

■ BIOS/FW/etc. Update

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

After rebooting the system, an update program is started automatically from the 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.

■ Help

Displays explanations about various functions of NEC EXPRESSBUILDER.

■ Return to the Top Menu

Choosing this menu returns to the Top Menu.

NEC EXPRESSBUILDER for Windows-Based (Master Control Menu)

The Master Control Menu is used to,

- Read documentation,

- Install the management software, and

- Install the viewer application (Adobe Acrobat Reader).

> **NOTES:**
>
> - Master Control Menu requires Microsoft Windows 95 (or later) or Windows NT 4.0 (or later).
>
> - Some documents are provided in the PDF format. Use the Adobe Acrobat Reader to read these documents.
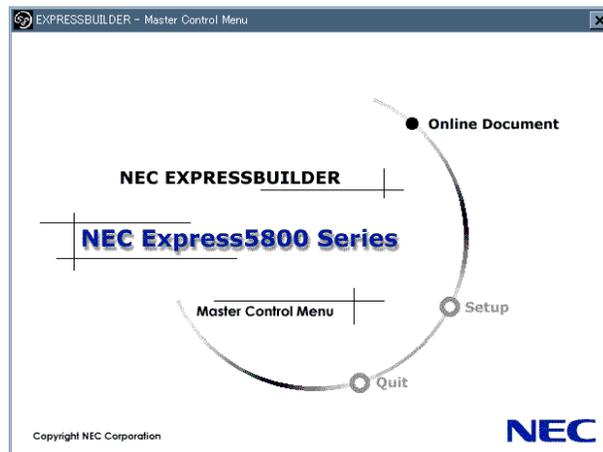
Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.   Master Control Menu appears on the screen automatically.   If the Autorun function is invalid in your system, run the \MC\1ST.EXE file in the CD-ROM directly. Some items are grayed-out when the logon user does not have the authority of the administrator or the item is not proper for the system.

To use Master Control Menu,

- Click on [Online Document], [Setup] or [Quit], or

- Click the right mouse button on Master Control Menu window.

CONFIGURATION DISKETTE CREATOR

"Configuration Diskette Creator" is a tool to create [Configuration Diskette] that is used for configuring the server with the Express Setup (see Chapter 5 for details).

If you use the Configuration Diskette created by the Express Setup and Configuration Diskette 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 [Configuration Diskette] to setup the servers from NEC EXPRESSBUILDER.

> **IMPORTANT:** You can not create [Configuration Diskette] for Microsoft Windows Server 2003 x64 Editions.

> **NOTE:** You can install Windows Server 2003 and Windows 2000 without [Configuration Diskette]. Also, you can modify/newly create [Configuration Diskette] during the setup with NEC EXPRESSBUILDER.

Creating Configuration Diskette

This section describes about specifying setup information that is necessary for OS installation and creating [Configuration Diskette]. Follow the procedure below.

> **NOTE:** In the procedure below, the folder name that is specified when installing Trekking command is assumed as [Configuration Diskette Creator].

1. Start the OS.

2. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.

    Master Control Menu will appear.

3. Right-click on the screen or left-click [Software Setup]. The menu will appear.
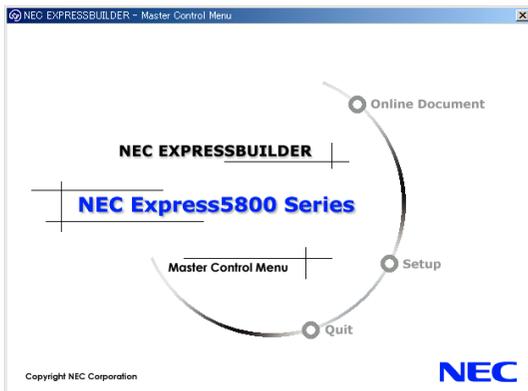
4. Click [Configuration Diskette Creator].

Configuration Diskette Creator window is displayed.

5. Click [Create New Information files] from the [File] menu.

The [Disk Environment] dialog box will be displayed.
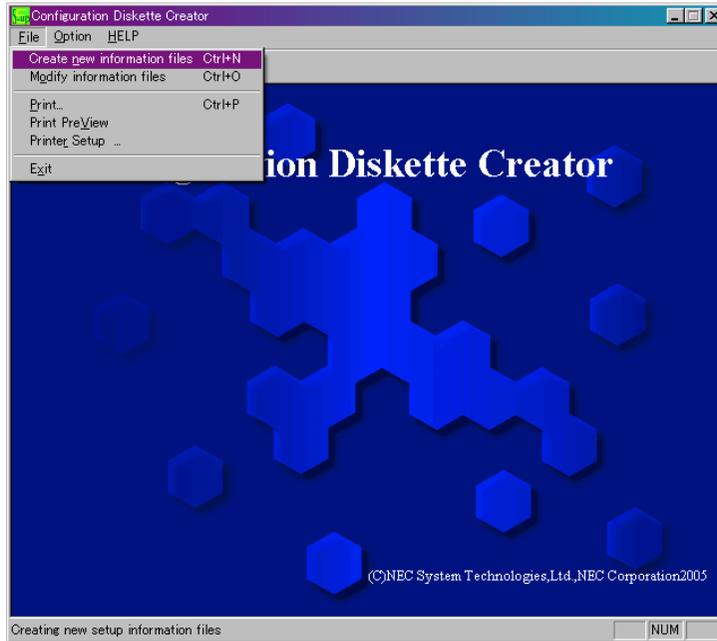
6. Specify each item and click [OK].

The dialog boxes to specify setup information will be displayed in order, such as [Basic Information] dialog box.
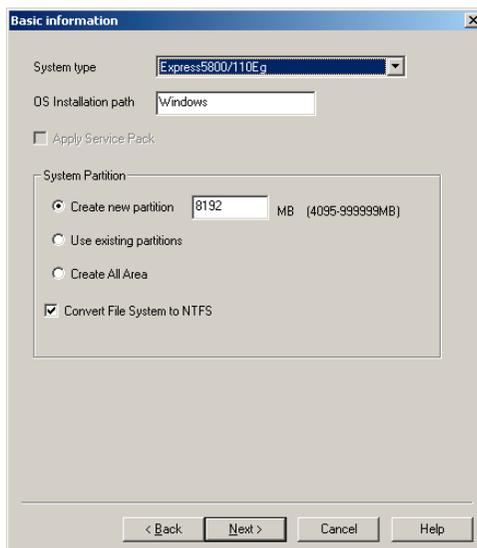
7. Follow the message to specify each item on the dialog box and click [Next].

> **NOTE:** If you click on [Cancel], all the input value will be deleted.

When completing the specification of setup information, the [Save Setup Information] dialog box will appear.

8. Confirm that the [Configuration Diskette] check box is checked, and input file name for the Setup File in [File Name].

9. Insert the floppy disk formatted by 1.44MB into the floppy disk drive and click [OK].

Now [Configuration Diskette] has been created. [Configuration Diskette] is used when you install Windows Server 2003 or Windows 2000. Put a label and keep it where it will not be lost.

> **NOTE:** For the information on the contents of each specifying item,
> refer to the Help.

If you want to modify the information file that already exists, click [Modify information files] on Configuration Diskette Creator window. Refer to the Help to modify the inf file.

Installing Optional Mass Storage Driver

To install optional Mass Storage Driver that is supported by the Express Setup, follow the procedure below to create [Configuration Diskette].

1. Display Configuration Diskette Creator window.

2. From the [File] menu, click [Create new information files].

[Disk Environment] dialog box will be displayed.

3. Specify each item and click on [OK].

The dialog boxes to specify setup information will be displayed in order, such as [Disk Environment] dialog box.
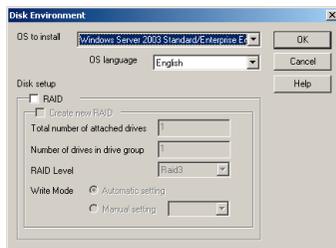
4. Follow the message to specify each item on the dialog box and click on [Next].

> **NOTE:** If you click on [Cancel], all the input value will be deleted.

5. When [User and application setup] is displayed, check [Apply OEM-FD for mass storage device].
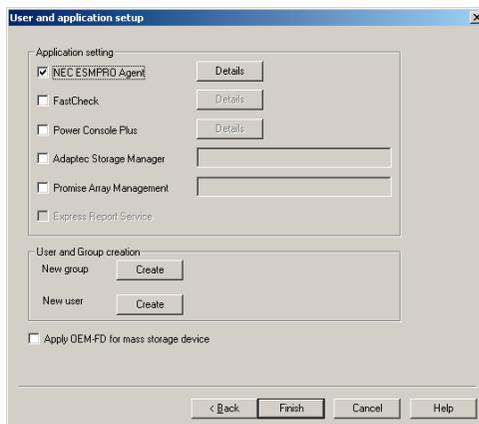
6. When the [Save Setup Information] dialog box is displayed, confirm that the [Configuration Diskette] check box is checked, and input file name for the Setup File in [File Name].

7. Insert the floppy disk formatted by 1.44MB into the floppy disk drive and click on [OK].

NEC ESMPRO

The NEC ESMPRO (referred to as ESMPRO hereafter) lets a system administrator manage remote servers across a network.   ESMPRO monitors server hardware and software configurations, failures, and performance.   With log data collected by ESMPRO, a system administrator can track long-term and short-term performance, monitor server usage, create graphs to record trends, and check server failure rates.   The administrator can use the information collected to create more efficient data routing procedures and optimize server usage.

> **IMPORTANT:** The NEC ESMPRO will start five minutes after the system startup due to initial operation of server management logic on the mother board.

Functions and Features

The 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 ESMPRO Manager include:

- Hardware and software server configuration
  - Hardware resources mounted in servers, such as the CPU, memory, disks, disk arrays, 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
  - 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.

For installation procedure and detailed explanations on NEC ESMPRO, refer to the online document in the NEC EXPRESSBUILDER CD-ROM.

Adaptec Storage Manager™ - Browser Edition

Adaptec Storage Manager™ - Browser Edition (hereinafter abbreviated to ASMBE) is a Web-based application that locally or remotely manages HostRAID storage system and provides RAID functions through the SCSI interface in your server. You can use the following functions for HostRAID by installing ASMBE in your system.

Features

- Creating disks at a level of RAID0, RAID1, or RAID10
- Creating Hot Spare disks that are to be used for automatically executing Rebuild if a redundant disk array enters the Degraded state
- Making a consistency check on redundant disk arrays
- Recording HostRAID events into the event log
- Omitting the installation of client software into each management PC if the previously mentioned browser is installed. This is because ASMBE uses the browser (Internet Explorer 5.5 or later).

Before attempting to operate ASMBE, read the "Adaptec Storage Manager™ - Browser Edition User's Guide" included in NEC EXPRESSBUILDER CD-ROM. The manual explains the ASMBE installation procedure and notes on operating ASMBE.

Promise Array Management

Promise Array Management is a RAID management utility for monitoring serial ATA RAID controller.

Refer to online documentation (pdf format) contained in NEC EXPRESSBUILDER CD-ROM for detailed explanation.

Power Console Plus

Power Console Plus is a utility to control the RAID system of the disk array controller (MegaRAID controller) produced by LSI Logic. Use of Power Console Plus enables operations (e.g., monitoring and maintenance) of RAID systems that are constructed on local NEC Express servers and NEC Express servers connected through networks (TCP/IP). The operations can be done online on graphical screens without the system being stopped.

Major Functions

Power Console Plus has the following features:

- Supporting the Wizard function to facilitate configuration

- Enabling the change of RAID levels

- Being compatible with SAF-TE

- Supporting the performance monitor

- Supporting enclosure functions such as temperature monitoring, power monitoring, and fan monitoring

- Enabling the settings of Write, Read, and Cache policies for each logical drive

- Supporting the save and restore functions for configuration

- Enabling the display of the SCSI transfer rate

Components

Power Console Plus consists of the following five components:

- SNMP Agent

  This function is not yet supported. Do not install SNMP Agent.

- MegaRAID Service Monitor

  Enables NEC ESMPRO to monitor the MegaRAID controller by registering event logs. Install MegaRAID Service Monitor in the NEC Express server in which the MegaRAID controller is mounted.

- MegaRAID Client

  Controls the RAID system on graphical screens. Install MegaRAID Client in the NEC Express server in which the MegaRAID controller mounted or in the management PC that is connected through the NEC Express server and network.

- MegaRAID Server

  Enables control of the MegaRAID controller via the network. Install MegaRAID Server in the NEC Express server in which the MegaRAID controller mounted.

■ MegaRAID Registration Server

Enables control of the MegaRAID controller via the network. Install in one of NEC Express servers and management PCs that are connected through network. The above components must be installed correctly for establishing the environment to use Power Console Plus.

Power Console Plus components to be installed are different between the target servers and management PC.

■ Server:
NEC Express server in which the MegaRAID controller is mounted

Install the following three components in this server:

– MegaRAID Service Monitor

– MegaRAID Server

– MegaRAID Client

■ Management PC:
Management PC that monitors and controls servers via the network (TCP/IP)

When managing array on Terminal Server working on Windows NT Server Version 4.0 Terminal Server Edition, prepare PC, and install Management PC component. Management PC does not guarantee operation on Client, which used Terminal Server, Terminal Server Emulator, WBT.

Start Power Console Plus of management PC, after the Power On machine that installed "Server" and "Management Server".

Install the following component in this PC:

– MegaRAID Client

■ Management server:
Machine that manages all servers that are monitored and controlled by management PCs

Install the following component in one of the servers or management PCs:

– MegaRAID Registration Server

Server Setup

This section explains Power Console Plus setup in the NEC Express server in which the MegaRAID controller is mounted.

Operating Environment

This section explains the operating environment required for Power Console Plus to operate on a server.

- ■ Hardware
  - – Machine:

    NEC Express5800 series connected with the MegaRAID controller
  - – Memory:

    Size large enough for OS operation + 8MB or more
  - – Free space of the hard disk:

    5MB or more
  - – Display unit:

    Screen size 1024 × 768 or larger
  - – Required peripheral equipment:

    Network Interface card

    CD-ROM unit

    Pointing device such as a mouse
- ■ Software
  - – Microsoft Windows Server 2003
  - – Microsoft Windows 2000
  - – Microsoft Windows XP

Management PC Setup

This section explains Power Console Plus setup in a computer that manages servers via the network (TCP/IP).

Operating Environment

This section explains the operating environment required for Power Console Plus to operate on a management PC.

- Hardware
    - Machine:

        NEC Express5800 series

        PC/AT-compatible machine (which contains Intel Pentium or a CPU at least equivalent to it)
    - Memory:

        Size large enough for OS operation + 8MB or more
    - Free space of the hard disk:

        5 MB or more
    - Display unit:

        Screen size 1024 × 768 or larger
    - Required peripheral equipment:

        Network Interface card

        CD-ROM unit

        Pointing device such as a mouse
- Software
    - Microsoft Windows Server 2003
    - Microsoft Windows 2000
    - Microsoft Windows XP
    - Microsoft Windows 95/98/Me (Internet Explorer 5.5 or later)
    - Microsoft Windows NT Version 4.0

        (Windows NT Version 4.0 Service Pack 6a + Internet Explorer 5.5 or later)

(This page is intentionally left blank.)

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 disks of the server on a regular basis.   For backup storage devices suitable for the server and backup tools, consult with your sales agent.

When you have changed the hardware configuration or BIOS configuration, select "System Information Management" and then "Save" of the Off-line Maintenance Utility to make a backup copy of the system information.

Also make a backup copy of the disk array configuration data if your system is in the array configuration.   When your hard disks have been auto-rebuilt due to a failure, it is recommended to make a backup copy of the configuration data.   To make a backup copy of the configuration data, use the configuration utility that is resident in the FLASH memory on the optional disk array controller board.   Refer to the manual supplied with the board.

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 1-3 to 1-8 for details.

- Do not disassemble, repair, or alter the server.
- Do not look into the CD-ROM drive.
- Do not remove the lithium battery.
- Disconnect the power plug before working with the server.

⚠ **CAUTION**

Observe the following instructions to use the server safely.   Failure to follow these instructions may cause a fire, personal injury, or property damage.   See pages 1-3 to 1-8 for details.

- Avoid installation in extreme temperature conditions.
- Make sure to complete board installation.
- Protect the unused connectors with the protective cap.

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.

1. Turn off the server and unplug all power cables.

2. Remove the left side cover.   (See Chapter 9.)

3. Use a small brush to loosen any dust and debris on the mother board.

4. Use computer grade canned air to blow dust off components on the mother board.

5. Use a small vacuum cleaner with plastic tip to vacuum out dust and debris from the interior of the server.

6. Reinstall the left side cover.   (See Chapter 9.)

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

1. Prepare cold or lukewarm water, neutral detergent, alcohol, two dry soft clothes, and cotton swabs.

2. Make sure that the server is off-powered (the POWER/SLEEP lamp goes off).

3. Turn the mouse upside down, and rotate the mouse ball cover counterclockwise to remove it.

4. Take out the ball from the mouse.   Cover the bottom of the mouse with your hand, and turn your hand holding the mouse (the mouse is on your palm with the button upward). The mouse ball is released onto your palm.

Bottom View   Roller
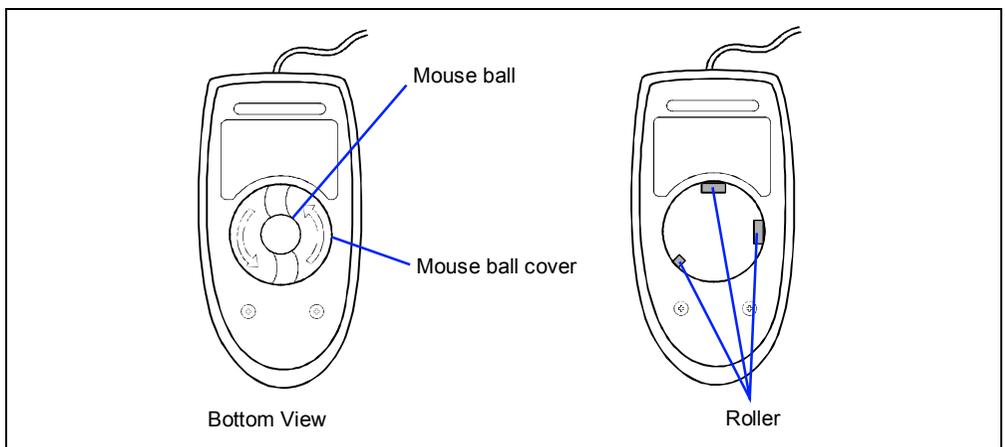
5. Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.

6. Rub off stains on the mouse ball.   Softly wipe the mouse ball with the cloth prepared in Step 5.

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

8. Wipe three small rollers inside the mouse with a cotton swab soaked with alcohol.   Wipe stains slowly and carefully by rotating rollers with the tip of the cotton swab.

9. Blow out any dust from the mouse.   Protect your eyes from the dust.

10. Put the mouse ball back into the mouse.

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

Cleaning CD-ROM

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

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

1. Make sure that the server is powered (the POWER/SLEEP lamp is lit).

2. Press the CD tray Open/Close button on the front of the CD-ROM drive.
    The tray opens.

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

    NOTE: Do not touch the signal side of the CD-ROM with your hand.

4. Wipe the tray with a dry soft cloth.

    IMPORTANT: Do not wipe the lens of the CD-ROM 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 CD-ROM with a dry soft cloth.

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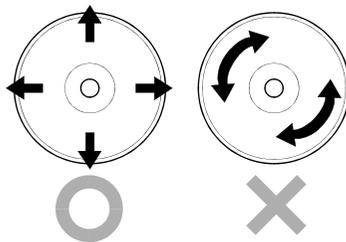
SYSTEM DIAGNOSTICS

The System Diagnostics runs several tests on the server.

Use the System Diagnostics program in the NEC EXPRESSBUILDER provided with the server to diagnose the server.

Test Items

The following items are tested in system diagnostics.

- Memory

- CPU cache memory

- Hard disk used as a system

> **IMPORTANT:** When executing the System Diagnostics, make sure to remove the LAN cable. Executing the System Diagnostics with the LAN cable connected, the network may be influenced.

> **NOTE:** On checking the hard disk, no data is written into the disk.

Starting and Ending the System Diagnostics

Procedures to start the diagnostics program is as follows:

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

2. Disconnect all the LAN cables from the server.

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

4. Use the NEC EXPRESSBUILDER CD-ROM to reboot the server.

See the Chapter 6 "NEC EXPRESSBUILDER" for details.

The following menu appears when started the server using the NEC EXPRESSBUILDER.

5. Select [Tools].

6.   Select [System Diagnostics].

The System Diagnostics starts and completes in approximately three minutes.

When the diagnosis completes, the screen of the display changes in the following indication.
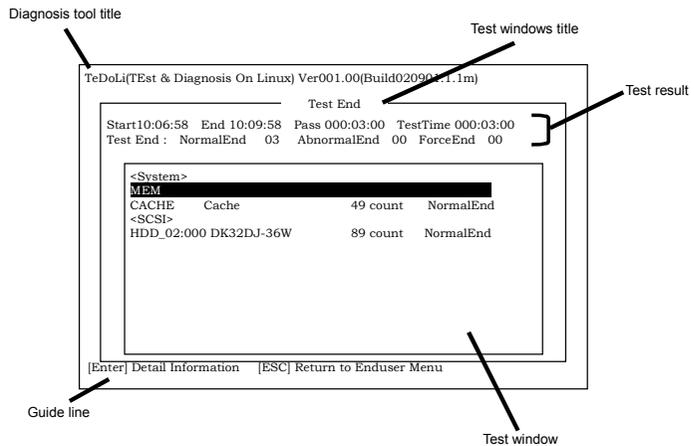
Diagnosis tool title: shows a name of this diagnosis and Version information.

Test windows title: shows the progress of diagnosis. When it completes, it shows "Test End"

Test Result: shows the information including time of start, end and progress, and result of the diagnosis.

Guide line: shows a description of keys to navigate the window.

Test window: Move the cursor and press Enter to view the detail of the diagnosis.

If an error is detected during the System Diagnostics, the test result shows "Abnormal End" in red color.   Move the cursor and press Enter on the diagnosis which error occurred.   Take a note of the error message showed, and contact your sales agent.

7. Follow the guideline showed in the bottom of the screen and press ESC to show the End user Menu showed below.

```
┌──────────────────────────────────────────────────────────────┐
│ 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. │
└──────────────────────────────────────────────────────────────┘
```
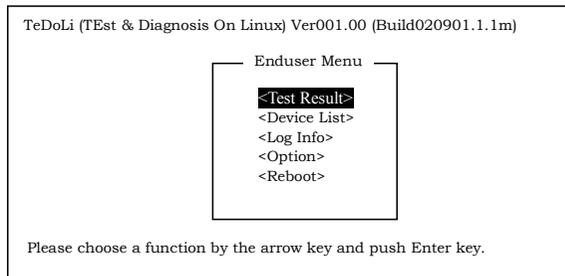
<Test Result> shows the screen of the diagnosis completed aforementioned.

<Device List> shows the information of all the devices connected.

<Log Info> shows the log information and error messages of the diagnosis. It can be saved to a floppy disk.   To save the log information to a floppy disk, insert a formatted floppy disk to a floppy disk drive and select <Save[F]>.

<Option> change where to output log

<Reboot> Restarts the Express Server.

8. Select <Reboot> in the End user Menu above.

The Express Server restarts, and NEC EXPRESSBUILDER boot the system.

9. Exit the NEC EXPRESSBUILDER, and remove the CD-ROM from the CD-ROM drive.

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

11. Reconnect all the LAN cables to the server.

12. Plug the power code.

This completes the System Diagnostics.

RELOCATING/STORING THE SERVER

Follow the procedure below to relocate or store 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 1-3 to 1-8 for details.

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

IMPORTANT:

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

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

- Make sure not to apply a shock to hard disks to relocated the server if the contains any.

1.   Take a floppy disk and a CD-ROM 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 with at least three persons to carry the server.

> **IMPORTANT:** Do not hold the front door to lift the server.   The front door may be disengaged from the server, causing personal injury.

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

(This page is intentionally left blank.)

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 Off-line Maintenance Utility, NEC ESMPRO, to the server and client computers.

SYSTEM VIEWERS

Monitor the occurrence of fault by NEC ESMPRO during the system operation.

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

[Example]
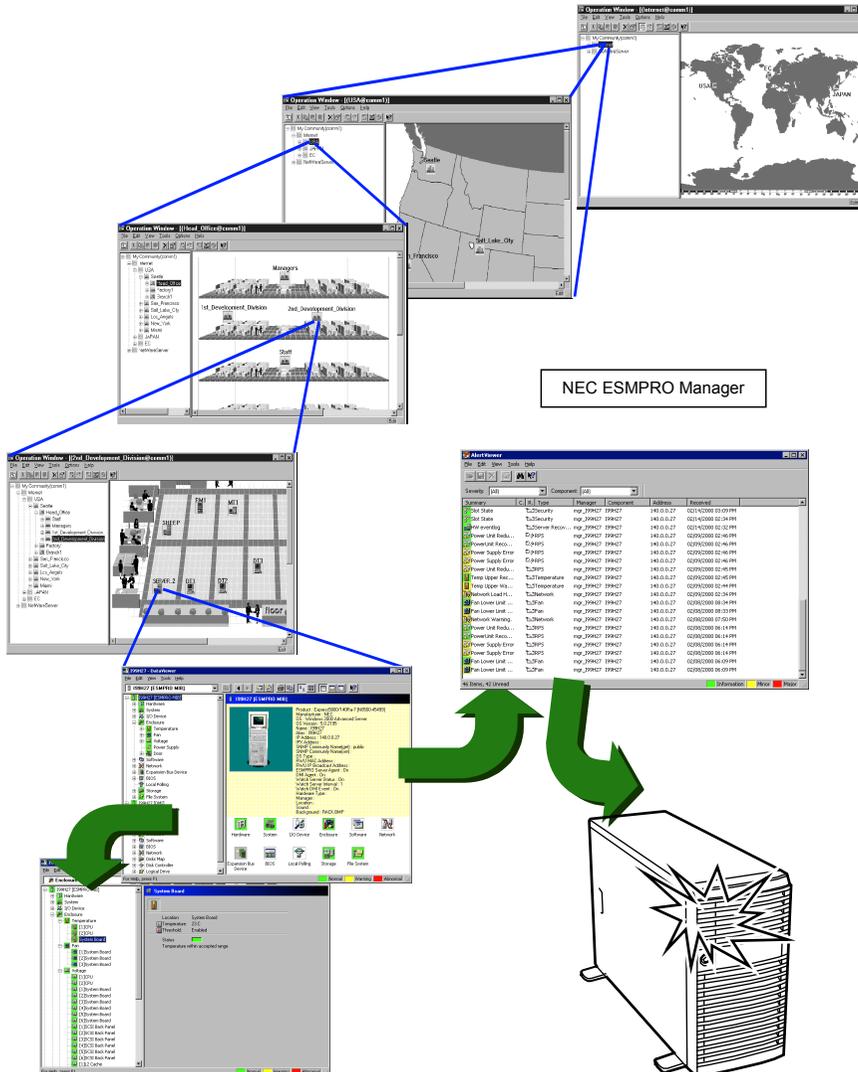
LAMPS

The following describes lamps on the server and their indications.   See Chapter 2 for each location.

LAN ACCESS Lamp (⊶)

The LAN ACCESS lamp is lit green when the server is connected to LAN.   The lamp blinks while the server is accessed through the LAN (for packet transmission).

STATUS Lamp (⚠)

The STATUS lamp stays lit in green when the server is in successful operation.   When the STATUS lamp is unlit or lit/flashing in amber, it indicates that the server has failed.

The following table lists indications of the STATUS lamp, descriptions, and actions to take.

> **NOTES:**
>
> ■ If the server has the NEC ESMPRO or Off-line Maintenance Utility installed, you can view the error log to identify the cause of a trouble.
>
> ■ To cycle power to the server, shut down the server from the OS to and reboot it, if available.   If the shutdown from the OS is not available, disconnect and connect the power cord to reboot the server.

STATUS lamp indication	Description	Procedure
On (green)	The server is operating normally.	–
Flashing (green)	• The server is operating with the memory or CPU in degraded state. • A single-bit memory error has often occurred.	Check the AC POWER lamp indication on the rear panel of the server. 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 lamp turns green when POST is completed.
	A CPU error occurred.	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.	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 lamp indication does not change when the fans are normal, contact your sales representative.
	A voltage alarm was detected.	Contact your sales representative.
Flashing (amber)	A fan alarm was detected.	Check if the fan units are firmly connected. If the STATUS lamp 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 lamp indication does not change when the fans are normal, contact your sales representative.
	A power supply alarm was detected.	Contact your sales representative.

POWER/SLEEP Lamp (☀)

The green POWER/SLEEP lamp lights to indicate normal operation while the server is powered. When the server is off-powered, the POWER/SLEEP lamp stays unlit.

The POWER/SLEEP lamp indicates that the server is running in the power-saving mode (sleep mode).   If the OS supports the power-saving mode such as Windows 2000, pressing the SLEEP switch blinks the POWER/SLEEP lamp in green and places the server in the power-saving mode. Press the POWER switch to turn out the POWER/SLEEP lamp and place the server back in the normal mode.

The power-saving mode is only available when the OS supports the power-saving feature.   Some OS's allow you to set the server to automatically turn in the power-saving mode when no access is made to the server for a certain period of time or to select the power-saving mode with a command.

DISK ACCESS Lamp (▯)

The DISK ACCESS lamp indicates the state of hard disks in the 3.5-inch hard disk drive bay.

This lamp lights in green every time any of such hard disks is accessed.

When the DISK ACCESS lamp is lit in amber, it indicates that a hard disk error occurred.   To identify a failed hard disk, see the lamps provided for each hard disk.

When the DISK ACCESS lamp lashes in green and amber by turns or in amber only, it indicates that hard disks connected to the internal disk array controller are in auto-rebuilding (reconfiguration).

Access Lamps

The access lamps for the floppy disk drive and the CD-ROM drive light when access is made to a media in the drive.

LAN Connector Lamps

The LAN connector on the rear panel has two lamps as follows.
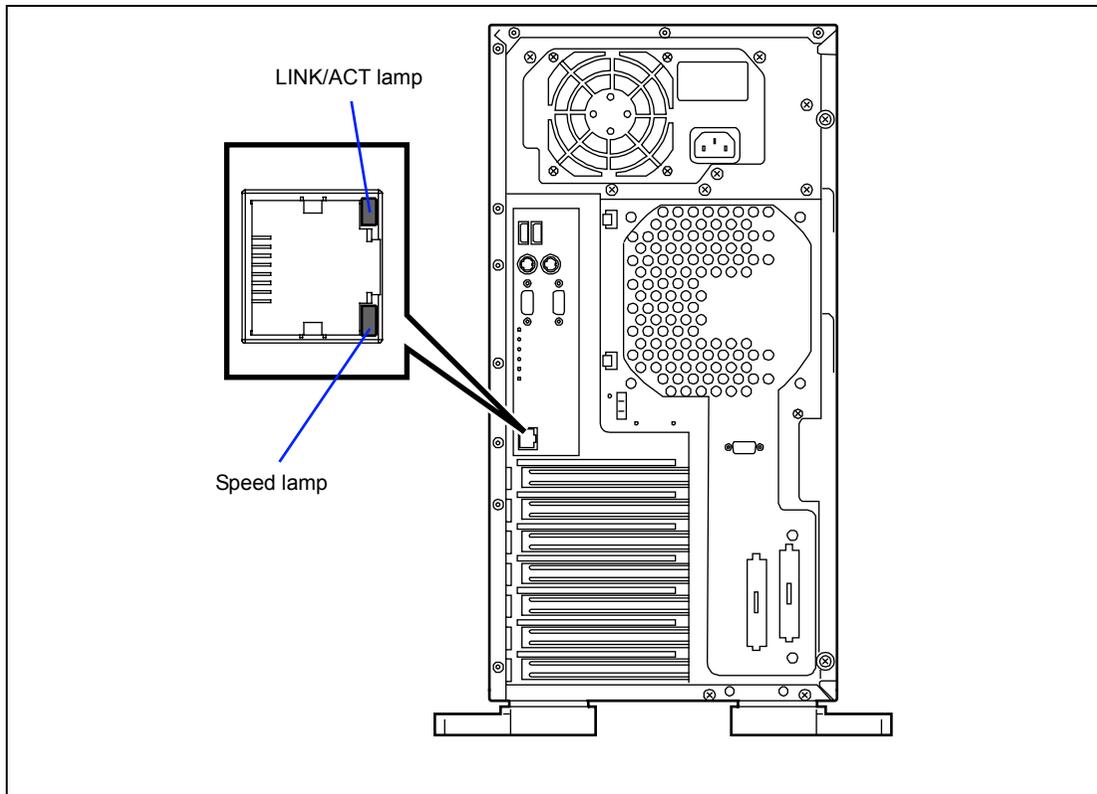
- ■   LINK/ACT lamp

  The link/ACT lamp indicates the state of each network port normally equipped with the server.   If the power is supplied to the server and the hub and they are correctly connected with each other, the lamp is lit green (LINK state).   If information is transmitted through a network port, the lamp blinks green (ACT state).

  If the lamp is not lit in the LINK state, check the network cable and the cable connection. If the lamp is not lit still after the checking, the network (LAN) controller may be defected. Contact your service representative.

- ■ 1000/100/10 lamp

  The 1000/100/10 lamp 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 lamp is lit amber, the network port is operated through 1000BASE-T.   If the lamp is lit green, the network port is operated through 100BASE-TX. If the lamp is off, the network port is operated through 10BASE-T.

ERROR MESSAGES

If an error occurs in the server, an error message appears on the display unit connected to the server.

Error Messages after Power-on

Powering on the server automatically starts the self-diagnostic program, POST (Power On Self-Test).   When the POST detects any error, it displays an error message and its measure on the display unit.

Follow the table below to troubleshoot such errors.   However, even when there is no hardware failure, use of the keyboard or mouse at the following timing causes the POST to assume a keyboard controller error and stop processing.

- Immediately after the server is powered
- Immediately after the system is rebooted in response to a keyboard instruction (simultaneous key entry of **Ctrl** + **Alt** + **Delete**)
- Immediately after the system is rebooted in response to an OS instruction
- During hardware initialization following restart of the POST

When the POST detects a hardware failure due to the above reason, restart the server once again. If the same error message reappears, you may assume there is no hardware error.   To ensure normal operation of the server, however, make sure to follow the following restrictions.

- Do not make any keyboard entry or use the mouse before the memory count appears on the screen following the server power-on.
- Do not make any keyboard entry or use the mouse before the start-up message of the Configuration Utility appears on the screen following the server reboot.

> **IMPORTANT:** Take a note on the on-screen message before contacting your sales agent.   The alarm indication would be a great help for maintenance.

POST Error Messages

When POST detects an error, it displays an error message on the display unit screen.   The following table lists error codes, error messages, and actions to take.

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

The response section in the following table is divided into three types:

- Warning:
  The message is displayed on screen and the error is logged to the SEL. The system will continue booting with a degraded state.
- Pause:
  The message is displayed on the screen and the boot process is paused until the appropriate input is given to either continue the boot process or take corrective action.
- Halt:
  The system cannot boot unless the error is corrected.

Error Code	Error Message	Response
0000	Timer Error	Pause
0003	CMOS Battery Low	Pause
0004	CMOS Settings Wrong	Pause
0005	CMOS Checksum Bad	Pause
0008	Unlock Keyboard	Halt
0009	PS2 Keyboard not found	Not an error
000A	KBC BAT Test failed	Halt
000B	CMOS memory size different	Pause
000C	RAM R/W test failed	Pause
000E	A: Drive Error	Pause
000F	B: Drive Error	Pause
0010	Floppy Controller Failure	Pause
0012	CMOS time not set	Pause
0014	PS2 Mouse not found	Not an error
0040	Refresh timer test failed	Halt
0041	Display memory test failed	Pause
0042	CMOS Display Type Wrong	Pause
0043	~<INS> Pressed	Pause
0044	DMA Controller Error	Halt
0045	DMA-1 Error	Halt
0046	DMA-2 Error	Halt
0047	Unknown BIOS error. Error code = 147 (this is really a PMM_MEM_ALLOC_ERR)	Halt
0048	Password check failed	Halt
0049	Unknown BIOS error. Error code = 149 (this is really SEGMENT_REG_ERR)	Halt
004A	Unknown BIOS error. Error code = 14A (this is really ADM_MODULE_ERR)	Pause

Error Code	Error Message	Response
004B	Unknown BIOS error. Error code = 14B (this is really LANGUAGE_MODULE_ERR)	Pause
004C	Keyboard/Interface Error	Pause
004D	Primary Master Hard Disk Error	Pause
004E	Primary Slave Hard Disk Error	Pause
004F	Secondary Master Hard Disk Error	Pause
0050	Secondary Slave Hard Disk Error	Pause
0055	Primary Master Drive - ATAPI Incompatible	Pause
0056	Primary Slave Drive - ATAPI Incompatible	Pause
0057	Secondary Master Drive - ATAPI Incompatible	Pause
0058	Secondary Slave Drive - ATAPI Incompatible	Pause
0059	Third Master Device Error	Pause
005B	Fourth Master Device Error	Pause
005D	S.M.A.R.T. Status BAD, Backup and Replace	Pause
005E	Password check failed	Pause
0120	Thermal Trip Failure	Pause
0146	Insufficient Memory to Shadow PCI ROM	Pause
0150	BSP Processor failed BIST	Pause
0160	Processor missing microcode – P0	Pause
0161	Processor missing microcode – P1	Pause
0180	BIOS does not support current stepping – P0	Pause
0181	BIOS does not support current stepping – P1	Pause
0192	L2 cache size mismatch	Pause
0193	CPUID, Processor stepping are different	Pause
0194	CPUID, Processor family are different	Pause
0195	Front side bus mismatch.	Pause
0196	CPUID, Processor Model are different	Pause
0197	Processor speeds mismatched	Pause
5120	CMOS Cleared By Jumper	Pause
5121	Password cleared by jumper	Pause
5122	CMOS Cleared By BMC Request	Pause
8104	Warning! Port 60h/64h emulation is not supported by this USB Host Controller !!!	Warning
8105	Warning! EHCI controller disabled. It requires 64bit data support in the BIOS.	Warning
8110	Processor 01 Internal error (IERR)	Warning
8111	Processor 02 Internal error (IERR)	Warning
8120	Processor 01 Thermal Trip error	Warning
8121	Processor 02 Thermal Trip error	Warning
8130	Processor 01 disabled	Warning
8131	Processor 02 disabled	Warning
8140	Processor 01 failed FRB-3 timer	Warning
8141	Processor 02 failed FRB-3 timer	Warning
8150	Processor 01 failed initialization on last boot.	Warning
8151	Processor 02 failed initialization on last boot.	Warning
8160	Processor 01 unable to apply BIOS update	Pause
8161	Processor 02 unable to apply BIOS update	Pause

Error Code	Error Message	Response
8170	Processor 01 failed BIST	Pause
8171	Processor 02 failed BIST	Pause
8180	BIOS does not support current stepping for Processor 1	Pause
8181	BIOS does not support current stepping for Processor 2	Pause
8190	Watchdog timer failed on last boot	Warning
8198	OS boot watchdog timer failure	Pause
8300	BaseBoard Management Controller failed Self Test	Pause
8301	Not enough space in Runtime area!!. SMBIOS data will not be available.	Pause
8305	Primary Hot swap Controller failed to function	Pause
84F1	BIST failed for all available processors	Halt
84F2	BaseBoard Management Controller failed to respond	Pause
84F3	BaseBoard Management Controller in Update Mode	Pause
84F4	Sensor Data Record Empty	Pause
84FF	System Event Log Full	Warning
8500	Bad or missing memory in slot 3A	Pause
8501	Bad or missing memory in slot 2A	Pause
8502	Bad or missing memory in slot 1A	Pause
8504	Bad or missing memory in slot 3B	Pause
8505	Bad or missing memory in slot 2B	Pause
8506	Bad or missing memory in slot 1B	Pause
8600	Primary & Secondary BIOS ID's don't match.	Pause
8601	Override Jumper is set to force boot from lower bank of flash ROM.	Pause
8602	WatchDog Timer Expired(Secondary BIOS maybe bad!).	Pause
8603	Secondary BIOS CheckSum fail.	Pause

Beep Codes

The following table lists the POST error beep codes. Prior to system video initialization, the BIOS uses these beep codes to inform users of error conditions.

Number of Beeps	Description	Recommended Action
1	Memory refresh timer error	Reseat the memory, or replace with known good modules.
2	Parity error in base memory (first 64KB block)	
3	Base memory read / write test error	
4	Motherboard timer not operational	Fatal error indicating a serious problem with the system. Consult your system manufacturer. Before declaring the motherboard beyond all hope, eliminate the possibility of interference by a malfunctioning add-in card. Remove all expansion cards except the video adapter.
5	Processor error	
6	8042 Gate A20 test error (cannot switch to protected mode)	
7	General exception error (processor exception error)	- If beep codes are generated even when all other expansion cards are absent, consult your system manufacturer's technical support. - If beep codes are not generated when all other expansion cards are absent, one of the add-in cards is causing the malfunction. Insert the cards back into the system one at a time until the problem happens again. This will reveal the malfunctioning add-in card.
8	Display memory error (system video adapter)	If the system video adapter is an add-in card, replace or reseat the video adapter. If the video adapter is an integrated part of the system board, the board may be faulty.
9	ROM checksum error	Fatal error indicating a serious problem with the system. Consult your system manufacturer. Before declaring the motherboard beyond all hope, eliminate the possibility of interference by a malfunctioning add-in card. Remove all expansion cards except the video adapter.
10	CMOS shutdown register read/write error	
11	Cache memory test failed	- If beep codes are generated even when all other expansion cards are absent, consult your system manufacturer's technical support. - If beep codes are not generated when all other expansion cards are absent, one of the add-in cards is causing the malfunction. Insert the cards back into the system one at a time until the problem happens again. This will reveal the malfunctioning add-in card.

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 sales agent.

Problems with NEC Express Server

No screen display appears with beep:

❑ Are DIMMs installed securely?

→ Check whether DIMMs are connected to the mating connectors firmly.

→ Check whether DIMMs of different specifications are installed in the specific bank.   See Chapter 9 for the specifications of DIMMs.

→ DIMMs must be populated in pairs and in the following order:
#1A and #1B, and then #2A and #2B.

→ Installed DIMMs must be the same speed and must all be registered.

When two pairs of the DIMMs are installed, the largest pair of the DIMMs must be installed to slots #2A and #2B.

→ Installed DIMMs starting from the one having largest memory.

→ Take a note of beep code pattern, and take appropriate action according to the table listed earlier in "Beep Codes".

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.

→ Make sure to use the power cord provided with the server.   Check the power cord for broken shield or bent plugs.

→ Make sure the power breaker for the connected power outlet is on.

→ If the power cord is plugged to a UPS, make sure the UPS is powered and it 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: [Server] - [Resume on AC Power Loss]>

❑ Did you press the POWER switch?

→ Press the POWER switch on the front of the server to turn of the power (the POWER/SLEEP lamp lights).

Fail to power off the server:

❏ Is the POWER switch enabled?

→ Restart the server and start the BIOS SETUP utility.

<Menu to check: [Security] - [Power Switch Inhibit]>

❏ Is the server running in the Secure Mode?

→ The POWER switch is disabled in the Secure Mode.   (Forced shutdown is also not available.)   To release the Secure Mode, enter the password specified with the BIOS SETUP utility.

POST fails to complete:

❏ Is the DIMM board installed?

→ At least two DIMM boards are required for operation.

→ DIMMs must be populated in pairs and in the following order: #1A and #1B, and then #2A and #2B.

→ Installed DIMMs starting from the one having largest memory.

❏ 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.

The POWER switch and sleep feature are disabled:

❑ Is the server in the Secure Mode?

→ In the Secure Mode, the POWER switch and sleep feature are disabled.   To release the Secure Mode, enter the password specified with the BIOS SETUP utility.

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.

❑ Is the server in the Secure Mode?

→ In the Secure Mode, the keyboard and mouse are disabled.   To release the Secure Mode, enter the password specified with the BIOS SETUP utility.

Fail to access (read or write) to the floppy disk:

❏ Does the floppy disk drive contain a floppy disk?

→ Insert a floppy disk into the floppy disk drive until it clicks.

❏ Is the floppy disk write-protected?

→ Place the write-protect switch on the floppy disk to the "Write-enabled" position.

❏ Is the floppy disk formatted?

→ Use a formatted floppy disk or format the floppy disk in the floppy disk drive. Refer to the manual that comes with the OS for formatting a floppy disk.

❏ Is BIOS configuration correct?

→ The floppy disk drive may be disabled with the BIOS SETUP utility of the server. Check the setting with the BIOS SETUP utility.

<Menus to check: [Advanced] - [Floppy Configuration]>

❏ Is the server in the Secure Mode?

→ In the Secure Mode, write access to the floppy disk may be disabled. To release the Secure Mode, enter the password specified with the BIOS SETUP utility.

Fail to access to the CD-ROM:

❏ Is the CD-ROM properly set in the CD-ROM drive tray?

→ The tray is provided with a holder to secure the CD-ROM. Make sure that the CD-ROM is placed properly in the holder.

❏ Is the CD-ROM applicable to the server?

→ The CD-ROM for Macintosh is not available for use.

Inserted the correct CD-ROM but the message like the following is displayed:

> The CD-ROM is not inserted or the wrong CD-ROM is inserted.
> Please insert the correct CD-ROM.
> OK

❏ Is the data side of the CD-ROM dirty or injured?

→ Take the CD-ROM out of the CD-ROM drive, confirm that it is not dirty or injured, reset and click [OK].

Fail to access the hard disk:
(Refer to the documentation supplied with the disk array controller.)

❑ Is the hard disk applicable to the server?

→ Operation of any device that is not authorized by NEC is not guaranteed.

❑ Is the hard disk properly installed?

→ Make sure to lock the hard disk with the lever on its handle.   The hard disk is not connected to the internal connector when it is not completely installed (see Chapter 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?

→ The SCSI connector on the motherboard in the server can be used for either built-in file devices or external SCSI devices.   The connection to built-in or external devices can be switched by modifying cable connection properly.   See Chapter 10.

❑ Are SCSI devices properly configured?

→ When the server has external SCSI devices connected, hard disk settings, including SCSI ID and terminator, are required.   Refer to the manual that comes with the SCSI device for details.

❑ Are the SCSI controllers properly configured?

→ Use the SCSI configuration utility for proper configuration of SCSI devices connected to the optional SCSI connector on the mother board.   When the server has an optional SCSI controller installed and SCSI devices connected to it, use the SCSI configuration utility that comes with the optional SCSI controller for proper configuration.   See the manual that comes with the optional SCSI controller for details.

Problems with Windows Server 2003 x64 Editions

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.

Problems with Windows Server 2003

When network cable isn't connected with a port, the following log may be found in event log. But this has no affect on the behavior of LAN driver.

Event ID: 6

Source: E100B

Type: Error

Description: Hardware failure detected.

Machine: Express5800/<Your Model Name>

Lan: 100BASE

Solution: Connect a network cable in a port and then reboot the system or change the [Smart Power Down] value to "Off", the log will not be found in event log any more.

Problems with Windows 2000

Cannot install the operating system correctly.

❑ Did you confirm the notes on installing the operating system?

→ See Chapter 6.

During Windows 2000 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 CD-ROM in the CD-ROM drive?

→ Take out the NEC EXPRESSBUILDER CD-ROM and restart the server.

❑ Is the OS broken?

→ Use recovery process to recover the system.   (See "Recovery for Windows 2000 System" in this Chapter.)

The event log after every logon to Windows 2000 includes the following error log:

> Description (D)
> The CPUs in this multiprocessor system are not all the same revision level.
> To use all processors the operating system restricts itself to the features of
> the least capable processor in the system. Should problems occur with
> this system, contact the CPU manufacture to see if this mix of processors
> is supported.

❑ Has the CPU been expanded?

→ If the different revision (stepping) of the processor is installed in the multiprocessor system, Windows 2000 logs the above information every startup. If this message is logged, it is no problem for operation.

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 CD-ROM to update the system. (See Chapter 6.)

Unable to update the system:

❑ Are you trying to update the system without applying Service Pack or with Service Pack 1, 2, or 3?

→ Without applying Service Pack and applying Service Pack 1, 2, or 3 to this system are not supported.

You have to apply Service Pack 4 to update the system.

If you use Windows 2000 CD-ROM which includes Service Pack 4 to install Windows 2000 on your system, you do not have to apply Service Pack 4 again when you update the system.

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 switch for 4 seconds). The power will not be turned off if you press the switch for less than 3 seconds.

The server is not found on the network:

❏ Is the LAN cable connected?

→ Make sure to connect the LAN cable to the network port on the rear of the server. Also make sure that the LAN cable to use 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.

<Menus to check:

[Advanced] - [PCI Configuration] - [Onboard NIC1 (10/100/1000) / Onboard NIC1 (10/100/1000) ROM]>

❏ 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 & Duplex" value the same as the value specified for HUB.

Problems with NEC EXPRESSBUILDER

When the server is not booted from the NEC EXPRESSBUILDER CD-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 CD-ROM drive first.

<Menu to check: [Boot]>

❏ Is an error message appeared?

→ When an error occurs while the NEC EXPRESSBUILDER is in progress, the following message appears. After this message appears, check the error and take the appropriate corrective action according to the message listed in the table below.

Message	Cause and Remedy
This machine is not supported.	This NEC EXPRESSBUILDER version is not designed for this server. Execute the NEC EXPRESSBUILDER on the compliant server.
NvRAM access error	An access to the nonvolatile memory (NvRAM) is not acceptable.
Hard disk access error	The hard disk is not connected or it is failed. Check whether the hard disk is correctly connected.

Problems with Express Setup

Express Setup can not be used

→ Express Setup does not support the installation of Microsoft Windows Server 2003 x64 Editions. If you want to perform re-setup, see Appendix D and perform "Manual Setup".

Following message appeared when you tried to install Express Setup to the hard disk that has smaller capacity than the specified partition size:

The specified partition size has exceeded the capacity of the hard disk.
The setup created the partition at the maximum size that can be reserved on the hard disk.
Setup will continue the process.
OK

→ It is not an abnormal condition.   Press **Enter** to continue the installation.

The message can not be displayed correctly when copying the files from CD-ROM or checking CD-ROM:

→ Press **R**. When the message appears again even if you press **R**, restart the Express Setup from the beginning.   In case the same result occurred after the restart of installation, contact Maintenance Service Company and ask them to check the CD-ROM drive.

Express Setup terminated and asks to input setup information.

→ There are some errors on the specified setup information.
Follow the instruction to input the correct value.   It is not necessary to cancel the installation.   On Windows 2000, you might be asked to press **Enter** again after the last reboot of the setup.

[Complete] appears on the [Role of Computer] screen.

→ If you click [Complete] here, the setup will select the default value of Express Setup for the later specification to continue the process.

<The Default Value for Windows 2000>

```
The specification of network protocol
    Protocol :        TCP/IP[DHCP Specified]
    Service :         Select sharing Microsoft network files and printer.
    Client :          Microsoft network client.
    Component :       SNMP, IIS (Excluding Professional and Windows Server 2003)
Application :         NEC ESMPRO Agent
                      Adaptec Storage Manager™ - Browser Edition (if the onboard
                      HostRAID controller is enabled)
                      Power Console Plus
                      (if optional SCSI RAID controller is installed in the system)
                      Promise Array Management
                      (if optional SATA RAID controller is installed in the system)
```

[Complete] does not appear on [Role of Computer] screen.

→   The [Complete] does not appear if the Setup File that has already been created is loaded.

→   [Complete] appears only when you first entered the [Role of Computer] screen. Once you go to the next screen from [Role of Computer], the [Complete] will not appear even if you enter [Back] to go back to the [Role of Computer] screen.

Select [Use Existing Array] at [New/Existing RAID Configuration], but the OS is installed in the whole area of the disk.

→   Is there any other partition than the partition to re-use (excluding maintenance area)? If the partition other than the one to re-use does not exist, the setup will reserve the whole area of the disk to install Windows 2000.

Specified to join the Domain, but the system is installed as Workgroup.

→   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.

Specified large value as partition size, but when Windows 2000 is actually started, the system partition is created by 4095MB.

→   Is the [Partition Size] specified by the value larger than the real area?   If you want to create one partition in all area of the hard disk (excluding the maintenance area) to install the OS, specify [All Area].

→   Are you specifying over 200GB for the partition size?

Be sure to specify less than 200GB for the partition size.

Windows 2000 started with different display resolution from the specified value.

→   If the specified display resolution can not be used, the system will use the nearest value or the default value of the driver.

Entered the incorrect Product ID/CD key.

→   Even if you entered the incorrect Product ID/CD key, Express Setup will start. However, the setup will stop and asks you to re-enter the correct value.   Also in this case, input request will occur when rebooting after GUI setup completed during Express Setup.   If these 2 inputs are done correctly, there is no problem on Windows 2000 setup.

The following message appears on the screen and the setup is suspended while the Express Setup is executing:

> Bad Command or filename
> Insufficient disk space

→ Follow the procedure described below and check the BIOS settings for the SCSI controller.
As for the procedure on the SCSI controller which is not described in this User's Guide, refer to the manual accompanied with the controller and check the setting for "Int13 Extensions".

<In case the SCSI Controller is AIC-7892>

1. Press **Ctrl** + **A** when POST displays "AIC-7892".

2. Select "Configure/View Host Adapter Settings".

3. Select "Advanced Configuration Options" and press **Enter**.

4. Change the setting of "BIOS Support for Int13 Extensions" to "Enabled".

5. Exit from BIOS setup menu and restart the system.

6. Start the Express Setup.

Unable to specify the details of Network adapter.

→ In Express Setup, you can not specify the details of Network adapter.   Specify them from Control Panel after starting Windows 2000.

Windows 2000 is started with Network adapter that has not been specified during Express Setup

→ Windows 2000 will install the recognized Network adapter specified as default value. If you want to modify the specification, it can be done from Control Panel after starting Windows 2000.   Also, the Network adapter that has been specified during Express Setup but that is not connected will not be setup, though the protocol will only be installed.

Connected more than two Network adapter and specified different protocol for each adapter, but all the protocols are specified on either adapter.

→ It's a design.   Each adapter is specified so that all the installed protocols can be used. The value that can not be specified during Express Setup will all be specified by default value.

When more than two Network adapter are specified, the detailed specification of TCP/IP protocol are all set to use DHCP.

→ When more than two Network adapter are specified, the detailed specification of the protocol may all be set by default value.   Re-specify the details from Control Panel.

Not more than two Network adapter is connected, but the detailed specification of the protocol are all set by default. (e.g. Specified IP Address on TCP/IP, but DHCP is specified)

→ Are you specifying more than two protocols?
In this case, the situation will be the same as connecting more than two Network adapter, so the detailed specification of the protocol are all set by default.
Re-specify the details from Control Panel after starting the OS.

The following error log is included in the event log while operating the system:

<Windows 2000>

Event ID:	16
Source:	iANSMiniport
Type:	Error
Category:	None
Description:	Team #0: The last adapter has lost link. Network connection has been lost.

Event ID:	11
Source:	iANSMiniport
Type:	Warning
Category:	None
Description:	Adapter link down: Intel(R) 82546EB Based Dual Port Network Connect...

→ Though the above error is included in the event log when specifying the teaming, the LAN driver can work properly.

Error Message during Disk Array Configuration

When an error is detected during the automatic Disk Array Configuration of the Easy Setup process, any of the following messages appears.

- An illegal device status exists in the status table.
- An illegal status is returned during the Configuration Data read.
- Configured device(s) is not responded.
- The configuration in NvRAM does not agree with the configuration in EEPROM.
- The number of pack configuring disks is 0 or 9 or above.
- An error occurs during the configuration table read.
- The configuration table in NvRAM cannot be read.
- An illegal RAID level exists in the configuration table.
- An error occurs during the CONFIG2 table transfer.
- The adapter is not responded.
- A CONFIG2 checksum error occurred.
- Adapter is not exists.

When one of above messages is observed, the Disk Array controller or the hard disk drive may be failed.   Check that cable connections and switch settings are correct, and then attempt to run NEC EXPRESSBUILDER once again.

Problems with Master Control Menu

The master control menu fails to appear:

❏ Is your system Windows NT 4.0 or later, or Windows 95 or later?

→ The menu is only able to run on Windows NT 4.0 (or later) or Windows 95 (or later).

❏ Is **Shift** pressed?

→ Setting the CD-ROM 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 CD-ROM.   In such a case, start the Explorer and run \MC\1ST.EXE in the CD-ROM.

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.

> **NOTE:** The different revision processor may be mixed in additional CPU kit.   When Windows 2000 is used, following message may be appeared in the System Log of the Event Viewer after extension the different revision of two or more CPUs in the NEC Express server. If this message is logged, it is no problem for operation.
>
>
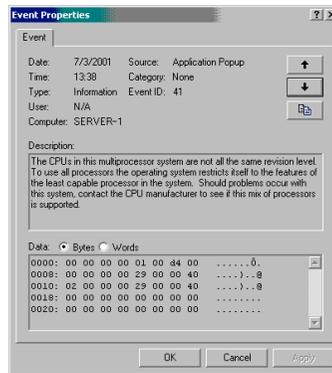
1. Click [Management Tool] → [Event Viewer] from the Control Panel.

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 2000 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.

<For Windows Server 2003>

>   Refer to Windows online help.

<For Windows 2000>

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 sales agent 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.

Preparing for Memory Dumping

Memory dumping with the DUMP switch may disable the server to restart.   In such a case, it is required to force the server to shut down.   This forced shutdown, however, is not available if "Enable" is selected for "Power Switch Inhibit" on the Security menu of the BIOS setup utility, SETUP, because this setting disables POWER switch operation.

Follow the procedure below to change the setting to enable the forced shutdown and restart of the server.

1. Power on the server and start the BIOS setup utility, SETUP.

2. Select "Disable" for "Power Switch Inhibit" in the Security menu.

3. Save the configuration data and exit the SETUP.

Saving the Dump File

Press the DUMP switch to save the dump file when an error occurs.   Insert a metal pin (a straightened large paper clip will make a substitute) into the switch hole to press the DUMP switch.
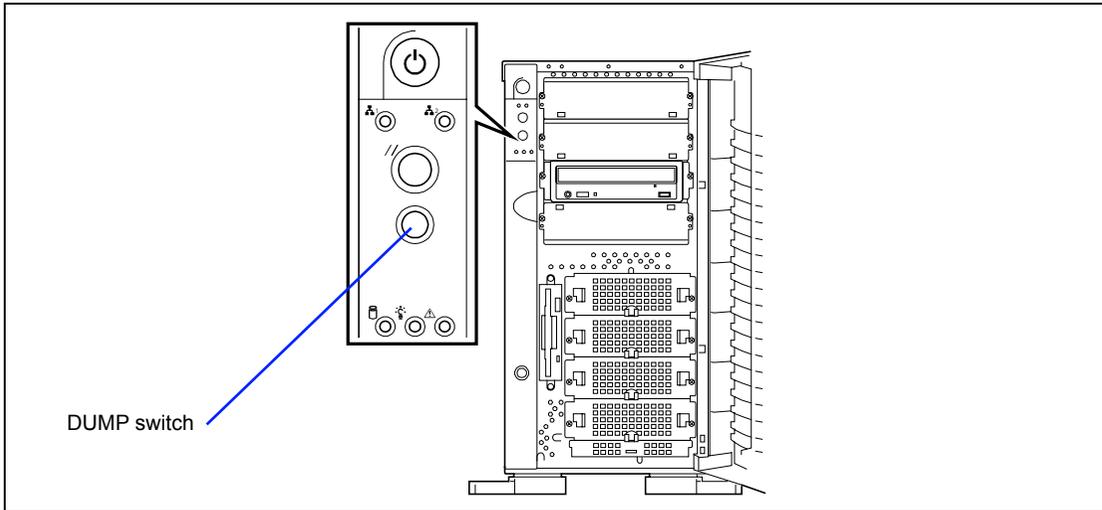
DUMP switch

Pressing the DUMP switch saves the dump file in the specified directory.   (Memory dumping may not be available when the CPU stalls.)

RECOVERY FOR Windows 2000 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 on Windows 2000, 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 can not be recognized, you can not recover the system.

Follow the procedure below and use the information in the disk, not system recovery disk, to recover the system.

1. Turn on the power of the system.

2. Insert Windows 2000 CD- ROM into the CD-ROM drive of your server.

3. 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.)

4. Press **F6** while the message "Setup is inspecting your computer's hardware configuration..." is displayed at the upper part of the screen.

    > **NOTE:** Nothing is changed on the screen through **F6** is pressed.

5. Press **S** when the following message appears:

    > 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.

    Select [Other] and press **Enter**.

6. Insert Windows 2000 OEM-DISK for NEC EXPRESSBUILDER into the floppy disk drive and press **Enter**.

    > Please insert the disk labeled
    > manufacturer-supplied hardware support disk
    > into Drive A:
    > * Press ENTER when ready.

7. Select the proper SCSI Adapter and press **Enter**.

    – INITIO INI-A10XU2W SCSI Host Adapter (When N8103-65F board is installed.)

    – MegaRAID SCSI 320-1 Controller Driver (When N8103-80F board is installed.)

    – Adaptec Ultra320 SCSI Cards (Win2000) (When N8103-75F board is installed.)

    – Promise FastTrak S150 SX4(tm) Controller-Intel x86 platform (When N8103-78 board is installed.)

    – Adaptec Embedded Serial ATA HostRAID Driver For Windows 2000/XP/2003 (When HostRAID is installed.)

    – Promise FastTrak S150 SX4100(tm) Controller-Intel x86 platform (When N8103-89 board is installed.)

8. Press **R** to select the recovery option.

9. If you are requested, press **R** to select system recovery procedure.

10. If you are requested, select either of the procedure below:

    [Manual Recovery] (Press **M**)

        Do not select this option unless you are a high-level user or a system administrator. If you use this option, you can recover the problems of system files, partition boot sector, and start-up environment.

    [Quick Recovery] (Press **F**)

        This option is very easy to use and the user does not need to do anything during the procedure.   If you select this option, the system recovery disk program starts to recover the problems concerning system files, partition boot sector of system disk, and start-up environment (if multiple operating systems are installed on the system).

11. Follow the instruction displayed on the screen, and then press **L** at the screen which request you to insert system recovery disk.   The system will be restarted once.

    > **NOTE:** Starts the procedure without system recovery disk.

12. Repeat steps 4 to 9.

    The recovery procedure will be started.

    During the recovery, the missing files and the damaged files are replaced either to the files in C:\ I386 folder of hard disk or the files in systemroot\ Repair of the system partition. These replaced files do not reflect the changes of the configuration after the setup at all.

13. Follow the instruction displayed on the screen.

    If you take a note of any file name in which trouble is detected during the procedure, it is useful to diagnose how the system has been damaged.

14. Terminates the procedure if the recovery is successful.

    You can verify that the replaced files are correctly copied to the hard disk if the computer is restarted normally.

OFF-LINE 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 sales agent.   The NEC EXPRESSBUILDER CD-ROM and the Off-line Maintenance Utility Bootable FD you have created contain a file that describes operation of the utility, but do not attempt to use the utility by yourself.   Contact your sales agent and follow instructions.
>
> ■ Starting the Off-line Maintenance Utility disables any access from a client to the server.

Starting the Off-line Maintenance Utility

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

■ From the CD-ROM

Set the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive and reboot the system.

After the menu is displayed on the screen, select "Tools" - "Off-line Maintenance Utility".

The Off-line Maintenance Utility program starts from the CD-ROM.

■ From the floppy disk

Set the Off-line Maintenance Utility Bootable FD in the floppy disk drive and reboot the system.

The Off-line Maintenance Utility program starts from the boot disk.

The Off-line Maintenance Utility Bootable FD is created by selecting "Tools" - "Create Support FD" on the NEC EXPRESSBUILDER.

■ Manual start (by pressing **F4**)

When the Off-line Maintenance Utility is installed, press **F4** while the start-up screen of the server is on screen.   The Off-line Maintenance Utility starts from the hard disk.

Features of Off-line Maintenance Utility

The Off-line Maintenance Utility provides the following features.   (Available features vary depending on the way you started the Off-line Maintenance Utility.)

> **IMPORTANT:** See the on-line help for details of the Off-line Maintenance Utility.   For further information, ask your sales agent.

■ IPMI Information Viewer

   Provides the functions to view the system event log (SEL), sensor data record (SDR), and field replaceable unit (FRU) and to make a backup copy of them. Using this feature, you can find system errors and events to determine a maintenance part.

■ BIOS Setup Viewer

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

■ System Information Viewer

   Provides the functions to view 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.

■ Start of Utilities

   With the NEC EXPRESSBUILDER, you can start the following utilities installed in the maintenance partition.

   –   System Diagnostics

   –   Maintenance Partition Update

RESETTING THE SERVER

There are two ways to reset 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.

■ Hard reset

Press the RESET switch at the front of the server.
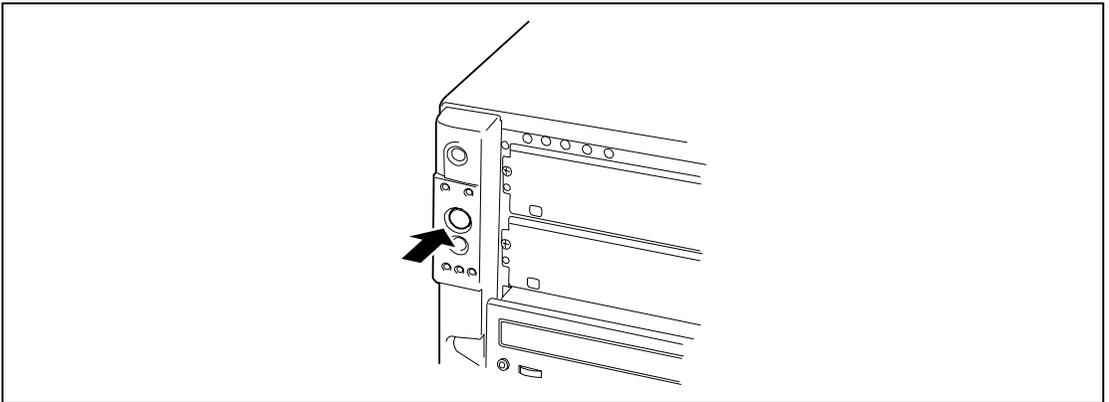
■ Soft reset

If the server halts before starting the OS, press and hold **Ctrl** and **Alt** and press **Delete**. This restarts the server.

FORCED SHUTDOWN

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

Press and hold the POWER switch on the server for 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).

Press here for at least 4 seconds.
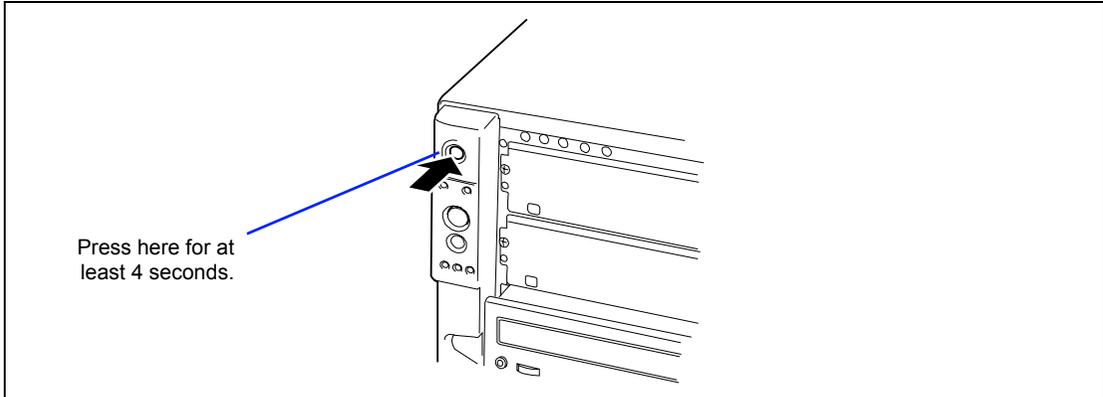
> **IMPORTANT:** If the remote power-on function is used, cycle the power once to load the OS, and turn off the power again in the normal way.

Chapter 9

Upgrading Your Server

This chapter describes internal optional devices available for the server, procedures for install or removing such optional devices, and notes on using them.

IMPORTANT:

- You may conduct the installation and removal procedures described in this section by yourself.   However, NEC is not responsible for any machine or component defects or bad influences resulting from the operation of the server subject to the installation or removal. NEC recommends that you request a maintenance engineer of your service representative having the expert knowledge on the server to do the installation and removal procedures.

- Use the options and cables approved by NEC.   You will be charged by any repair of a malfunction, fault, or defect occurring in a server in which one or more component not approved by NEC are used.

- Use NEC EXPRESSBUILDER to update the system if the hardware configuration is changed (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 1-3 to 1-8 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 1-3 to 1-8 for details. ■ Avoid installation in extreme temperature conditions. ■ Make sure to complete board installation. ■ Protect the unused connectors with the protective cap.

STATIC PRECAUTIONS

An electrostatic discharge (ESD) can damage disk drives, option boards, and other components. Electronic device can be easily damaged by static electricity.   To prevent damage, observe the following information.

■ 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.

■ Clothe

   – 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 a component by its edge to avoid touching any terminals or components.

   – To store or carry any component, place it in an anti-static bag.

PREPARING FOR INSTALLATION AND REMOVAL

Prepare the installation or removal of a component depending on the following procedure:

1.   Shut down the OS.

2.   Press the POWER switch to turn off the power of the server.   (The POWER/SLEEP lamp goes off.)

3.   Pull out the power cord from the AC inlet on the server.
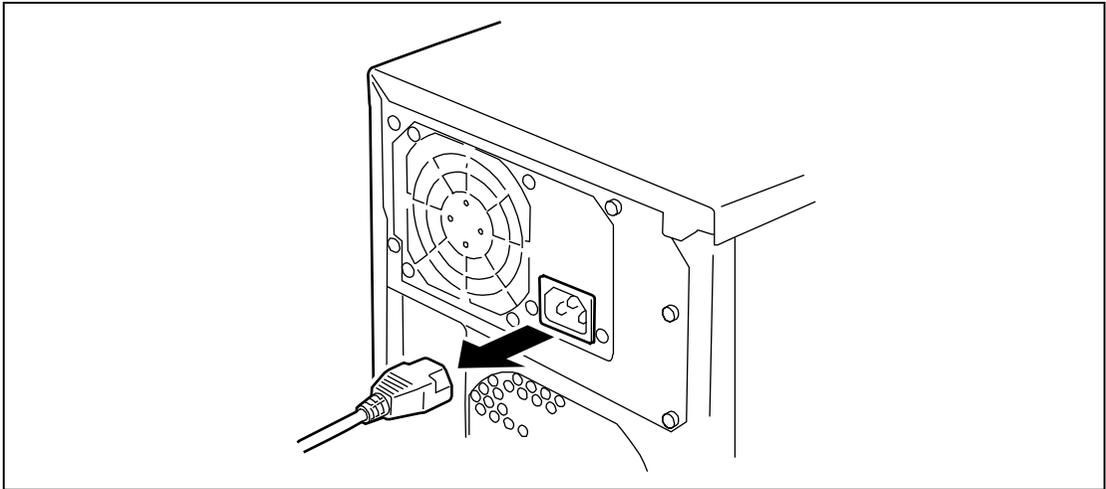
4.   Remove all the cables connected to the server on the rear panel.

5.   Make the clearance of 1m to 2m in the front and rear sides and left and right sides of the server.

DEVICE INSTALLATION OR REMOVAL PROCEDURE

Install or remove a component from the server in the following procedure.

Side Cover

The left side cover should be removed to access to built-in devices and/or mother board in the server. It is not necessary to remove the right side cover.

Removal

Remove the left side cover in the following 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 1-3 to 1-8 for details. ■ Disconnect the power plug before working with the server.

1.   See the section "Preparing for Installation and Removal" described earlier to prepare.

2.   Loosen the two screws.

3.   Slide the cover backward a little.

4.   Hold the side cover securely to remove it.

Screws
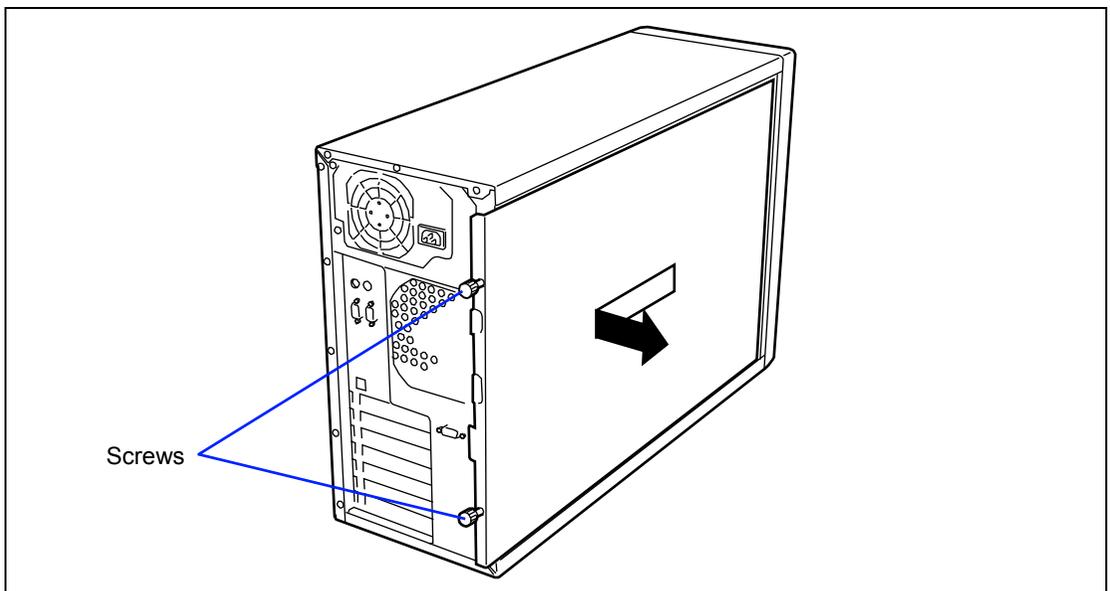
Installation

The side cover can be installed in the reverse procedure of the removal.   Make sure that the hooks on the side cover are inserted into the frames and holes of the server securely.

> **IMPORTANT:** After one or more optional devices are installed or removed completely, install the removed side cover securely.
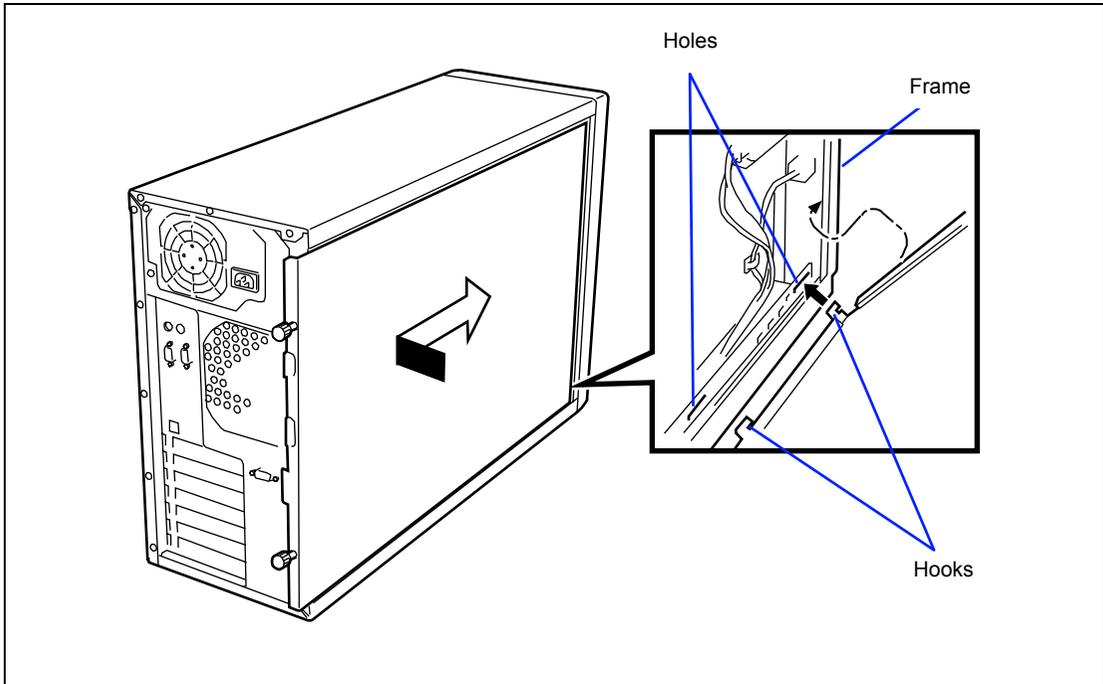
Processor Air Duct

To install or remove the DIMM or processor, you will need to remove the air duct.

> **IMPORTANT:** Do not assemble the server without installing the air duct. No duct installed in the system reduces cooling efficiency and can affect performance or cause damage due to overheating.

Removal

Follow these steps to remove the air duct.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.

2. Remove the side cover.

3. Hold the left side of the air duct, and push the right end of the tab to release from the chassis.

4. Remove the duct from the chassis.
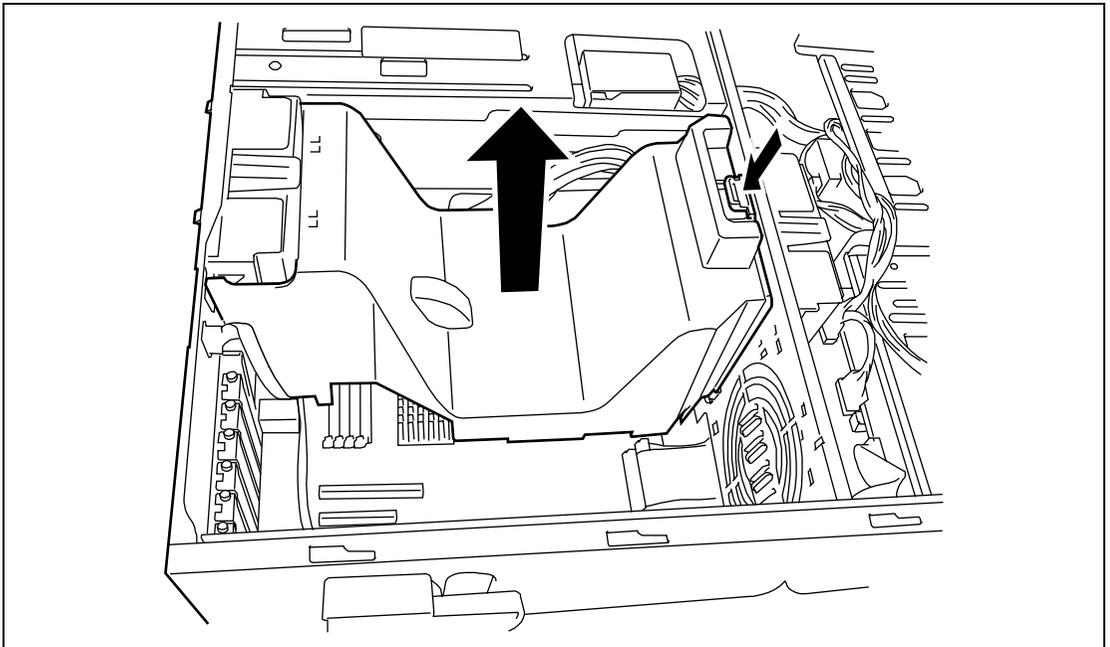
Installation

Follow these steps to install the air duct.

1. Holding the internal cables clear, place the air duct into the chassis.

2. Adjust the air duct until the frame of the right end of the duct is aligned with the hook on the chassis.
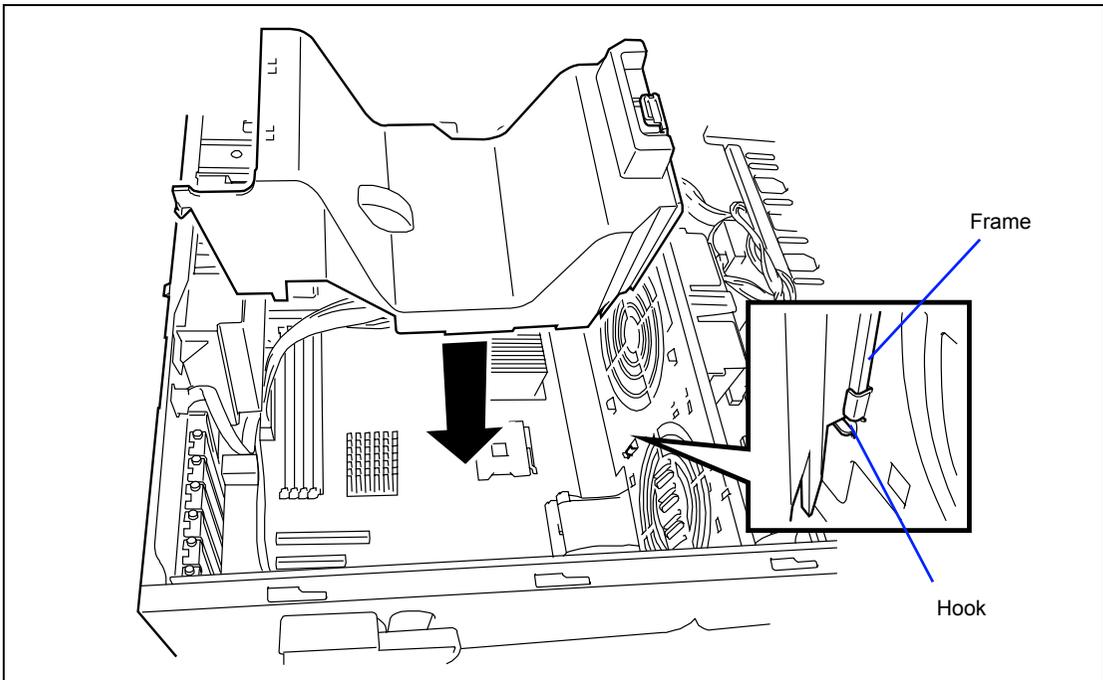
3. Reinstall the side cover.

Hard Disk

The 3.5-inch hard disk drive on the front of the server contains four slots on which hard disks can be installed.   The device bay is not equipped with any hard disks (excluding when one or more built-in hard disks are ordered).   Purchase the hard disks additionally if required.

> **IMPORTANT:**
>
> - Do not use any hard disks not approved by NEC.   If an unapproved third party's hard disk is installed in the server, not only the hard disk but also the server itself may be defected.   Consult your service representative for purchasing hard disk.
>
> - Observe safety precautions described in Chapter 1 and static precautions described in this chapter before proceeding the procedures described here.
>
> - For the RAID configuration, refer to the manual that comes with the RAID controller.

Setting Operation Mode

Configure the operation mode of hard disks installed in the server as listed below.
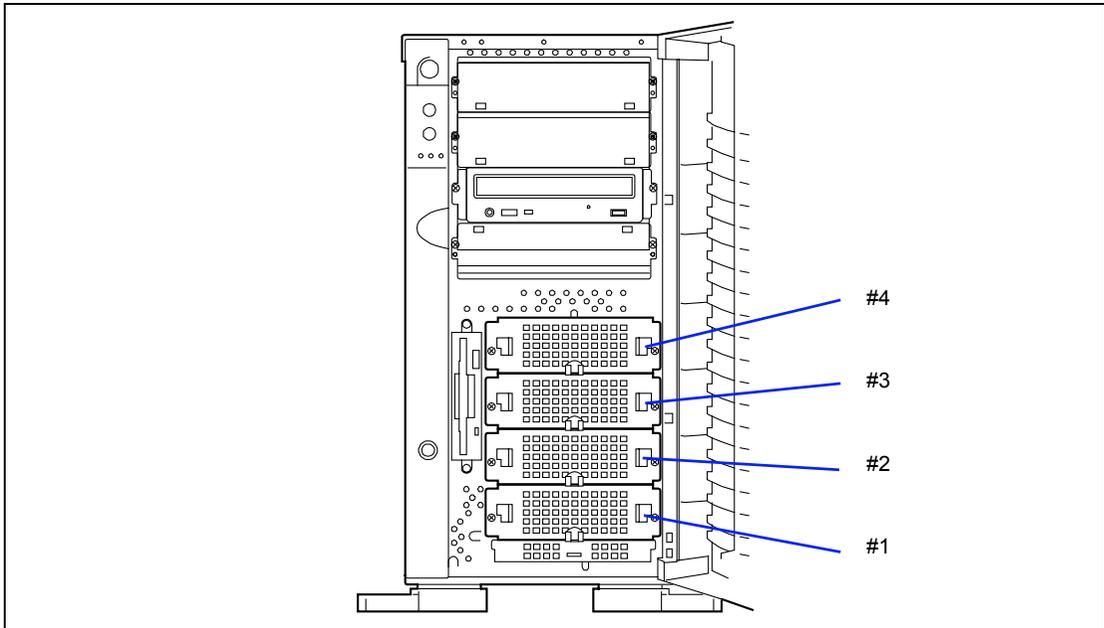
- SATA hard disk drive

Hard Disk	Bay to Install
First hard disk	Disk bay #1
Second hard disk	Disk bay #2
Third hard disk *	Disk bay #3
Fourth hard disk *	Disk bay #4

   * Optional SATA RAID controller is required.

- SCSI hard disk drive [*1]

Hard Disk	SCSI ID	Start Command	Bay to Install
First hard disk	ID0	Enable	Disk bay #1 (bottom)
Second hard disk	ID1	Enable	Disk bay #2
Third hard disk	ID2	Enable	Disk bay #3
Fourth hard disk	ID3	Enable	Disk bay #4
Fifth hard disk [*2]	ID4	Enable	Disk bay #5
Sixth hard disk [*2]	ID5	Enable	Disk bay #6 (top)

*1 Optional SCSI controller or RAID controller is required.

*2 Optional SCSI RAID controller and hot-swap hard disk drive cage are required.

Set the SCSI termination to "OFF" for all hard disks.   SCSI termination should be set to "ON" at the end of the internal SCSI cable.

Installation

Install a hard disk in the following procedure.   A hard disk may be installed in any other slot in the similar procedure.

> **IMPORTANT:** In the disk array configuration, hard disks configuring a specific pack should have the same specification including the capacity.

> **NOTE:** Hard disks can be installed or removed from the server only by opening the front door.   In the disk array configuration, hard disks may be installed or removed with the power of the server being on.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.

2. Release the lock of the front door by using the security key to open the front door.

3. Remove the side cover.

4. Check the slot in which the hard disk is installed.

5. Loose two screws securing the drive carrier.
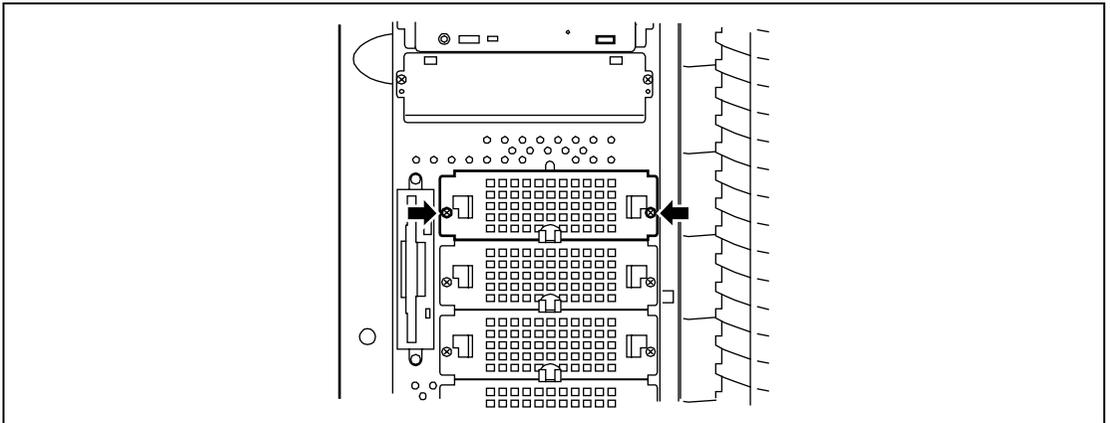
6. Remove the drive carrier.

> **IMPORTANT:** To maintain the cooling effect in the server, install the
> dummy tray in the vacant slot of the disk bay.
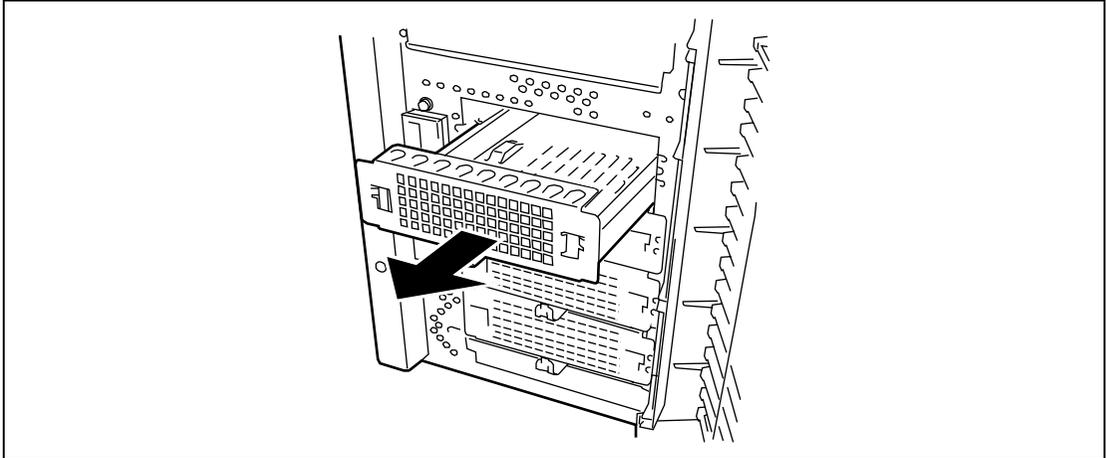
7. Place the hard disk onto the carrier, with its connector facing the rear of the carrier.
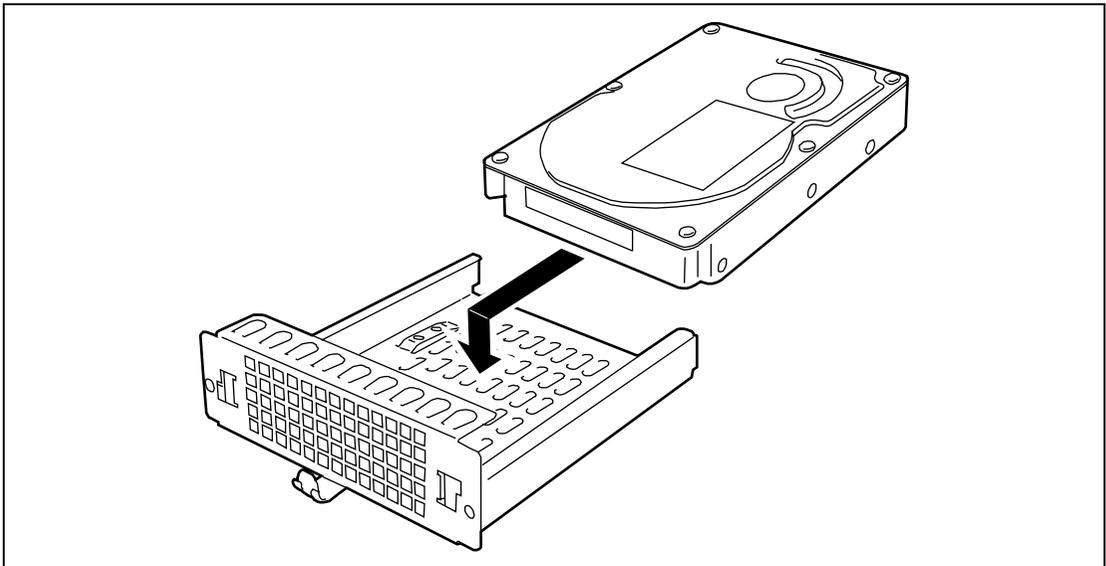
8. Turn the hard disk and carrier over and secure the hard disk in the carrier with four screws supplied with the hard disk.

> **IMPORTANT:** Use the screws that came with the hard disk.   If not, use the screws that came with the server.
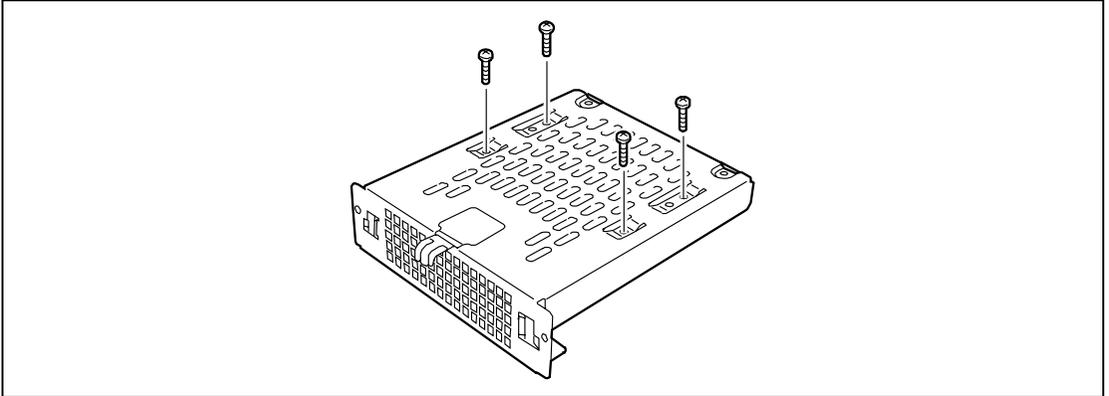
9. Install the drive carrier into the hard disk bay and secure the carrier to the chassis with two screws removed in Step 5.
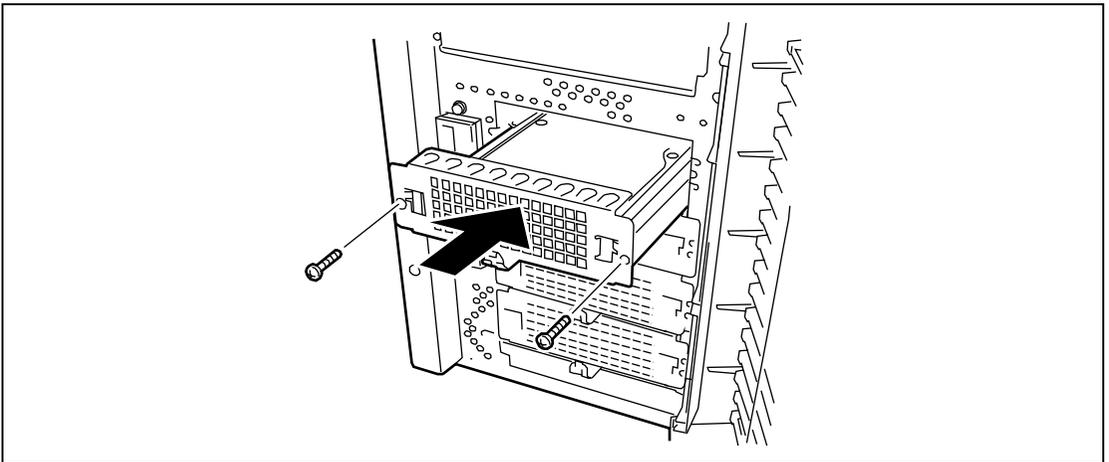
10.   Connect the interface cable and power cables. See Chapter 10 for details.

> ### IMPORTANT:
>
> - Keep the socket cover removed from the power cable connector or interface cable connector for future use.
>
> - For serial ATA hard disk drives, use the relay cable connector that comes with the optional serial ATA cable as shown figure below.
>
>
>
> Relay cable connector
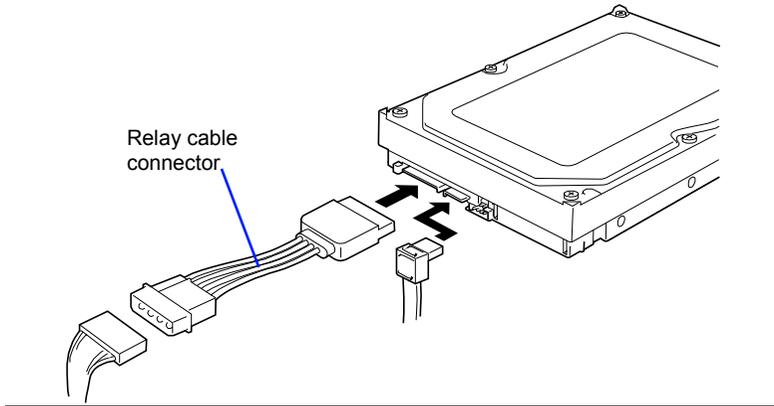
11.   Reinstall the side cover.

12.   Close the front door.

Removal

Remove the hard disk in the reverse procedure of the installation.

In the disk array configuration, the auto rebuild function can be used.   The auto rebuild function can record the information saved in a defected hard disk into the new replaced disk to recover the server to the state before the occurrence of the fault.

The auto rebuild function is valid for disk arrays set to RAID1, RAID5, or RAID10.

Refer to the manual supplied with your RAID controller for detail explanation.

5.25-inch Device

The server contains four slots in which backup devices including CD-ROM and magnetic tape drives can be installed.
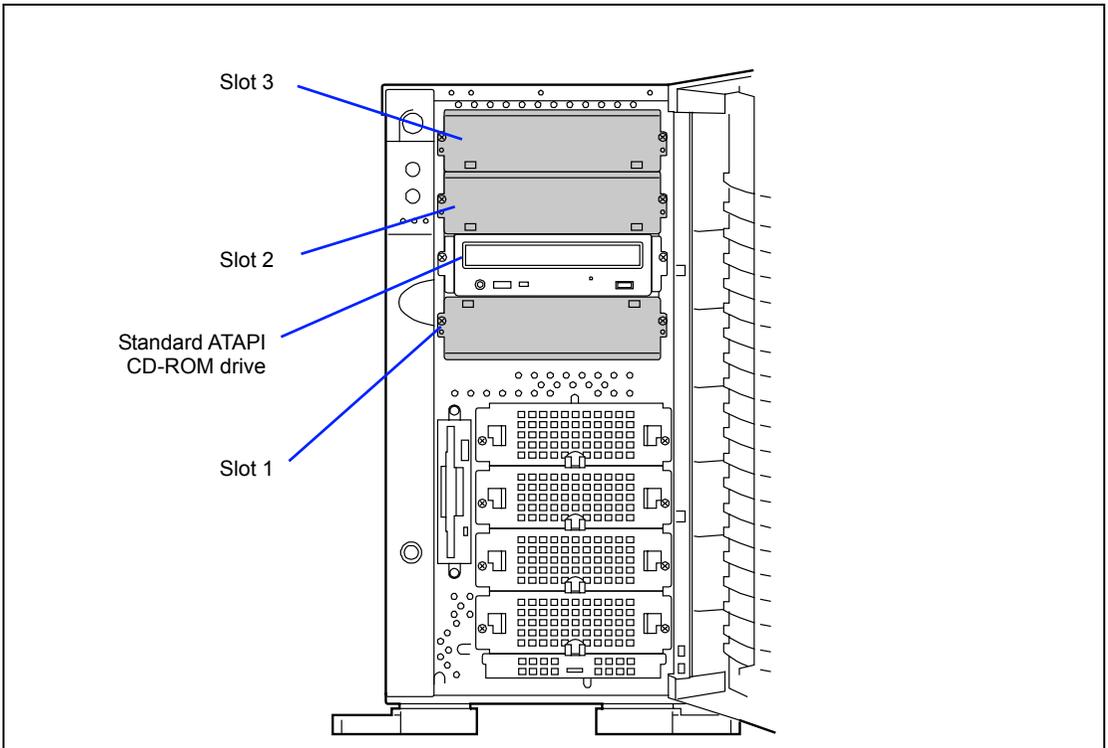
IMPORTANT:

- The server can include a maximum of two devices: two half-height devices, or one half-height device and one full-height device.

- Set the SCSI termination of the 5.25-inch device to be installed to OFF and the SCSI ID to a value which is not duplicated or corrupted with that of any other device.   Refer to the documentation coming with each of the devices for how to set the values.

- For half-height device, first install a device in slot 1.   Then install another device in slot 2.
  For full-height device, install the device to the slots 2 and 3.

- To install N8151-13ACF of the built-in DAT collective type [DDS-3], use the power blanch cable installed on the device.

Installation

1. See the section "Preparing for Installation and Removal" described earlier to prepare.

2. Remove the side cover.

3. Remove the two screws fixing the dummy cover.

4. Pull out the dummy cover toward you carefully.

> **NOTE:** When installing a full-height device, remove two dummy covers.
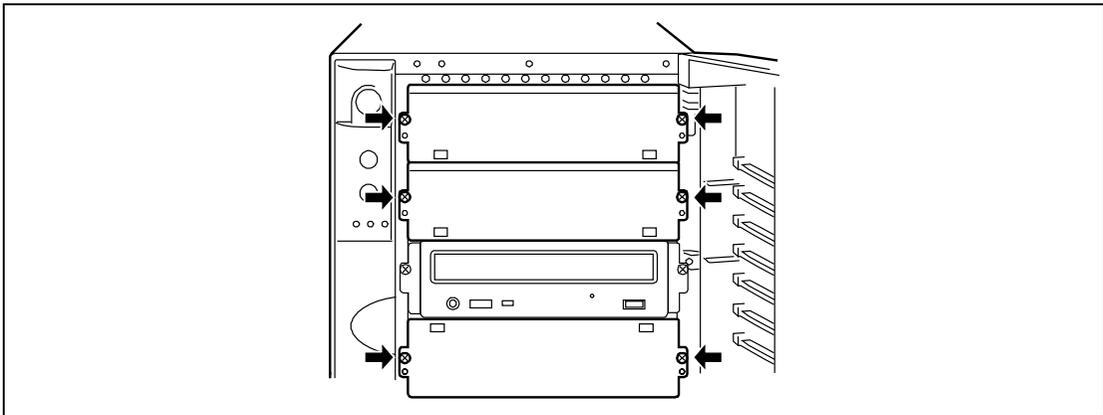
5. Fix the rails coming with the server to the 5.25-inch device by using the four screws coming with the device.
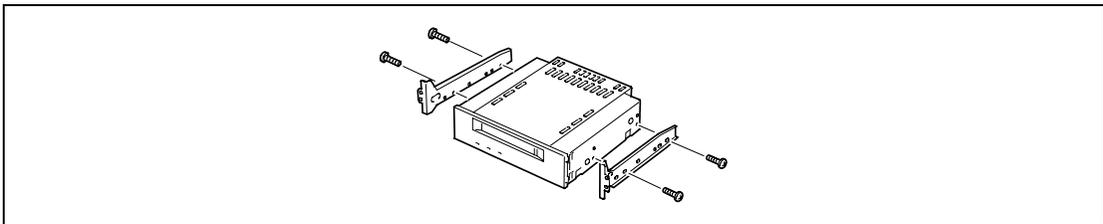
> **IMPORTANT:**
>
> - Always use the screws coming with the 5.25-inch device.   Using longer screws or those of different diameter may cause the device to be broken.
>
> - When installing a double-height device, use the DLT device rails that come with the server.

6. Push the 5.25-inch device to the device bay carefully.

> **NOTE:** Make sure that the cables are not caught while the 5.25-inch device is pushed into the slot.

> **IMPORTANT:** If a 5.25-inch device occupying two slots cannot be inserted easily, push the device to the slots with it lifted a little.

7. Fix the rails by using the screws removed in step 3.

Half-height device   Full-height device
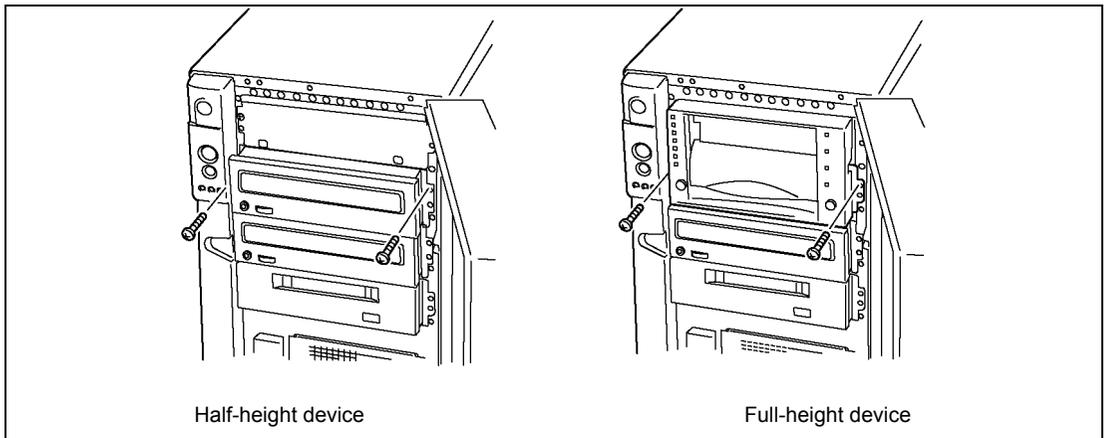
8. Check whether the installed 5.25-inch device is projected too much from the front of the server.

Check the device installed in a 5.25-inch device bay based on the CD-ROM drive normally installed.

9.   Connect the SCSI and power cables to the 5.25-inch device installed from the left side of the server.

See "Cable connection" for details.

> **IMPORTANT:** Connector pin bending or incomplete connection may cause a malfunction to occur.   Provide the connection securely watching the 5.25-inch device and cable connectors.

> **NOTE:** Make sure that the cable is not caught.
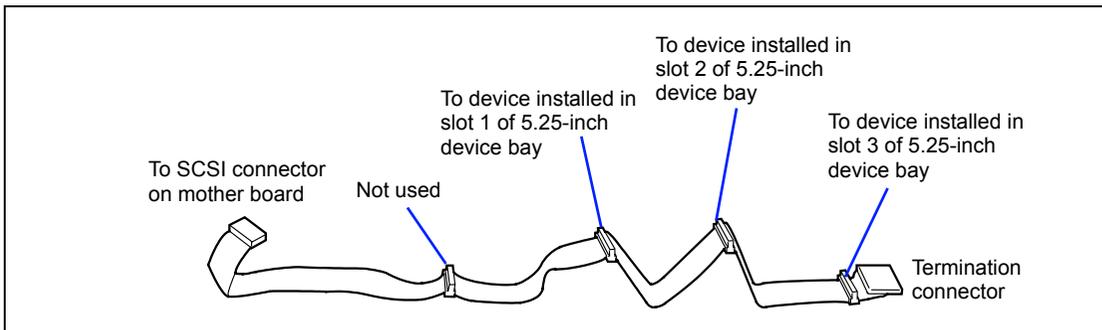
10.   Install the removed components.

11.   Provide the setup for the server referring to "SCSI BIOS" in Chapter 4.

Removal

Remove the 5.25-inch device in the reverse procedure of the installation.

PCI Board

The server contains six slots into which PCI boards can be inserted.

> **IMPORTANT:** Any PCI board is easily affected by static electricity. Handle a PCI board after making your body contact with a metallic frame section of the server to discharge the static electricity on your body.   Do not make bare hands contact with terminals and components on the PCI board.   In addition, do not put the PCI board on a desk directly.   See "Static Precautions" in this chapter for details of the static electricity.

> **NOTE:** When a PCI board is installed, removed, or removed from the present slot and then installed in another slot, modify the detailed settings including the interrupt lines (IRQ) by using the BIOS setup utility SETUP if necessary.   See Chapter 4 for the settings of the interrupt line states and I/O spaces at the shipment of the server.

PCI #5, 32-bit/33MHz, PCI

PCI #4, PCI EXPRESS (x4)

PCI #3, 32-bit/33MHz, PCI

PCI #2, 64-bit/66MHz, PCI-X

PCI #1, 64-bit/66MHz, PCI-X

Mother board
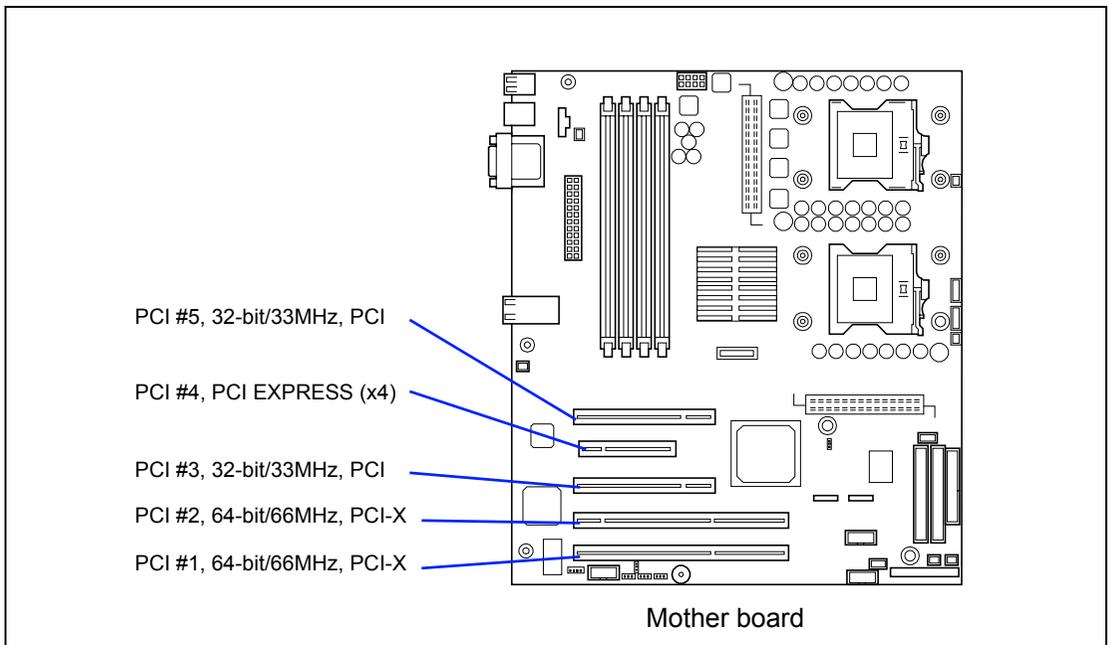
*   Do not install a set of PCI boards providing a specific function to extend over both the 64-bit and 32-bit PCI buses.

Installation

Install a board connected to a PCI board slot in the following procedure.

IMPORTANT:

■ 3.3V or universal PCI boards can be installed in PCI board slots #1 and #2.

■ 5V or universal PCI boards can be installed in PCI board slots #3 and #5.

NOTE: To install a PCI board, make sure that the board connecting section is engaged with the connector of the PCI board slot.

List of optional devices and their available slots

N Code	Product name		Slot (Bus A)		Slot (Bus B)	Slot (Bus C)	Slot (Bus B)
			PCI-X #1	PCI-X #2	PCI #3	PCIe #4	PCI #5
		Performance	64-bit/ 66 MHz		32-bit/ 33MHz	x4	32-bit/ 33MHz
		Profile	Full-height				
		Voltage	3.3 V		5V	x8	5V
		Board size*1	Long/Short				
N8103-65F	SCSI controller		√	√	√	–	√
N8103-56F	SCSI controller		√	√	√	–	√
N8103-75F	SCSI controller		√	√	√	–	√
N8103-95F	SCSI controller		√	√	√	–	√
N8103-78F	Disk array controller (SATA)		–	–	–	–	√
N8103-89F	Disk array controller (SATA)		–	–	–	–	√
N8103-80F	Disk array controller (1ch)		–	√	√	–	√
N8104-111	100BASE-TX adapter		√	√	√	–	√
N8104-86	100BASE-TX adapter (2ch)		√	√	√	–	√
N8104-103	1000BASE-T adapter		√	√	√	–	√
N8104-113	1000BASE-T adapter (2ch)		√	√	√	–	√
N8104-112	1000BASE-SX adapter		√	√	√	–	√
N8104-114	1000BASE-T adapter		√	√	√	–	√

√: Can be installed. –: Cannot be installed.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.

2. Remove the side cover.

3. Define the slot in which a board is installed and remove the connector cap of the slot.

   IMPORTANT: Keep the removed connector cap carefully.

4. Remove a screw securing the I/O cover.

5. Remove the expansion slot cover.

   IMPORTANT: Keep the expansion slot cover being removed carefully.
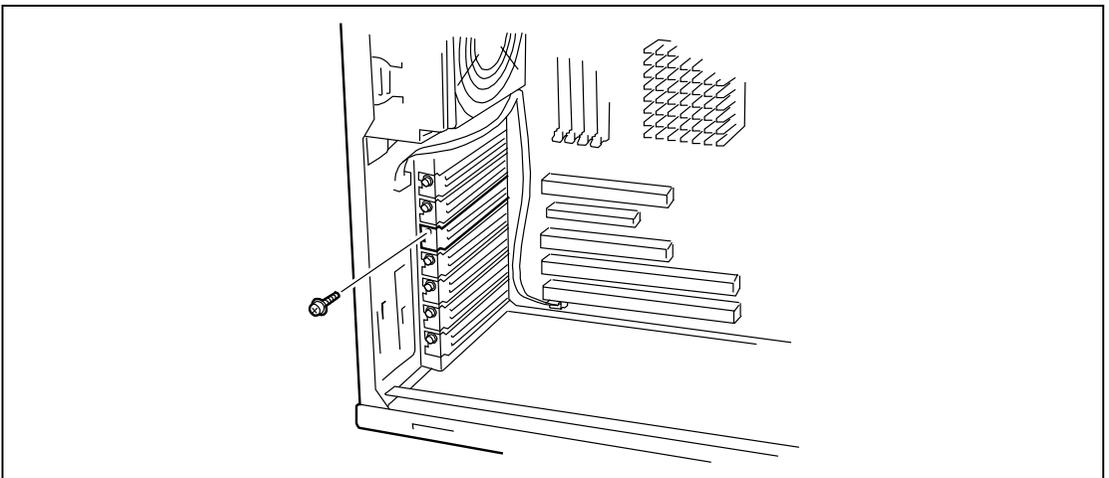
6. On the edge opposite the connectors, grasp the board by both corners. Orient the board to the vacant slot so that the metal retention bracket is toward the rear of the chassis.

7. Insert the board into the front retention mechanism and rear guide rails. Carefully push the board until it engages and fully seats in the slot connector.

> **IMPORTANT:** If the board cannot be installed easily, remove the board once and then reinstall it.   Excess force added to the board may cause the board to be broken.

Guide rail
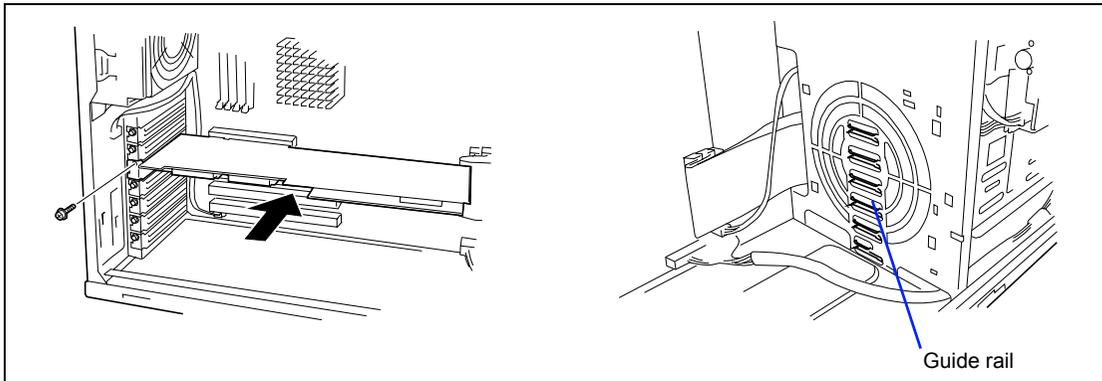
8. Fix the board with a screw removed in Step 2.

9. Reinstall the removed components.

10. Turn on the power of the server.   Then make sure that any error message does not appear in POST.

If an error message appears, write down the message and review the error message list in Chapter 8.

Removal

Remove the board in the reverse procedure of the installation.   Then install the connector cap and additional slot cover.

RAID Controller Board

The RAID controller board is an optional PCI board developed to improve data reliability.   The board can be installed to use the hard disks in the 3.5-inch disk bay of the server and those in additional disk unit in the disk array configuration.

The server can include the following optional RAID controller.

- SCSI disk array controller (N8103-80F)
- SATA disk array controller (N8103-78F)

See the manual that comes with your RAID controller for detail.

Cautions

Note the following on the configuration of a disk array.

- The disk array controller board is easily affected by static electricity.   Handle the disk array controller board after making your body contact with a metallic frame section of the server to discharge the static electricity on your body.   Do not make bare hands contact with terminals and components on the disk array controller board.   In addition, do not put the disk array controller board on a desk directly.   See "Static Precautions" for details of the static electricity.

- To change the disk array configuration or the RAID, the hard disks must be initialized. If important data is saved in the hard disks used to constitute a disk array, first back up the data in other hard disks before installing boards and configuring the disk array.

- More than one hard disk is required to configure a disk array.

- Hard disks used in the disk array configuration should have the same disk revolution rate and capacity in packs.

- See "PCI Board" in this Chapter for the slot in which a board can be installed.

- Several RAID (Redundant Arrays of Inexpensive [Independent] Disks) levels can be set for the disk array configuration in the server in which disk array controller boards are installed.   Refer to the online document saved in "NEC EXPRESSBUILDER" CD-ROM coming with the server or the documentation coming with the disk array controller for details of the available RAIDs, data transfer rate, and array configuration.

- The available capacity of the hard disks in the disk array configuration is lower than the total capacity of the hard disks configuring the disk array while the disk reliability is improved.

- Replacement of disk array controller board

  Restore the disk array configuration information in the disk array controller boards.   Use the configuration utility for the restoration.   Refer to the online document saved in "NEC EXPRESSBUILDER" CD-ROM coming with the server or the documentation coming with the disk array controller for details.   If a disk array controller is replaced, create the configuration information newly by using the proper utility.

- Only one disk array controller board can be installed in the server.

Using Internal Disks in Disk Array Configuration

For the installation of the RAID controller board, see "PCI Board" and the manual that comes with the RAID controller board. The DISK access lamp on the front panel of the server indicates the access status of the hard disk drive connected to the RAID controller board. Before the access status can be indicated, the LED connector on the RAID controller board and the LED connector on the mother board must be connected through the LED cable supplied with the server.

- Mother Board

  The LED connector is at the position shown in the figure below. It can be connected in either direction.

- RAID Controller Board

  The red cable of the LED cable comes out from the connector hole. Connect the connector hole to "LED Active" of the LED connector on the RAID controller board.   For the position of the LED Active pin, see the manual supplied with the RAID controller board.
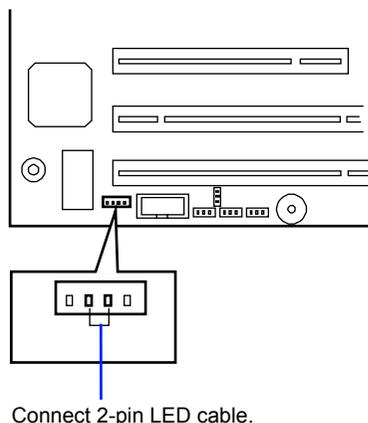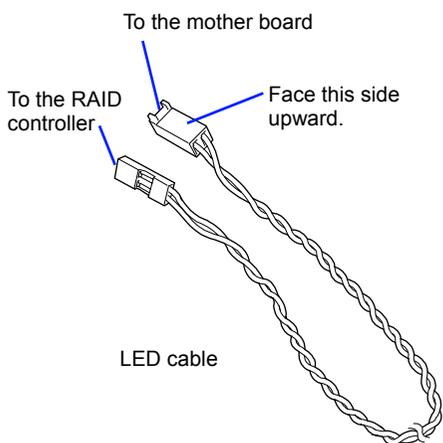
Use the interface cable supplied with the RAID controller board. Disconnect the current cable from the server and keep it in a designated place. For details on the cable connection, see the manual supplied with the RAID controller board.

After installing the RAID controller board, make settings such as RAID setting, using the disk array BIOS utility of the RAID controller board. For details on the setting procedures, see the manual supplied with the RAID controller board.

Disk Array Configuration of Additional Disk Unit

The N8141-36F additional disk unit is exclusively used for installation of hard disks.   The cabinet can contain up to 14 hard disks.   The server equipped with disk array controller boards can be connected with up to two additional disk units.   (See Chapter 10 or the documentation coming with the additional disk unit for details of the additional disk units.)

> **IMPORTANT:**
>
> ■ The additional disk unit does not contain hard disk drives.
>   Purchase the drives additionally.
>
> ■ To connect with additional disk unit, use the server of rack-mount
>   type, or use the additional disk unit of tower type (pedestal type). In
>   both cases, you need an optional conversion kit.

To connect the server with the N8141-36F additional disk unit, any of the following optional cables are required:

■ K410-93(01) additional disk unit connecting SCSI cable

■ K410-93(03) additional disk unit connecting SCSI cable

■ K410-93(06) additional disk unit connecting SCSI cable

After the connection of the additional disk unit to the server, provide the disk array configuration for the additional disk unit by using the Disk Array Configuration. See the manual that comes with the disk array controller for details of the procedure.

In the disk array configuration of the additional disk unit, the auto rebuild function which the disk array controller board has can recover the data if any one of hard disks installed in the additional disk unit is defected to destroy data.   (Replace the defected hard disk with a new one with the power being on (hot-swap)).

SCSI Controller Board

SCSI controller board (N8103-56F/65F/75F) is a PCI board to control hard disk drives and file devices that operate through the SCSI interface.

The SCSI controller board is necessary in the following cases:

- Installing a file device in the 5.25-inch device bay of the server
- Using a SCSI hard disk as an internal hard disk
- Connecting external SCSI equipment.

Notes

The following explains notes on using the SCSI controller board:

- The SCSI controller board is an electronic component easily affected by static electricity. Before handling the SCSI controller board, discharge static electricity from your body by touching the metal frame of the server or the like. Do not touch the terminals or parts of the SCSI controller board with your bare hands, or do not place the SCSI controller board directly on a desk. See "Static Precautions" for details on static electricity.
- When connecting hard disks containing an OS to the SCSI controller board, install them in the PCI slots in ascending order of the slot numbers.
- See "PCI Board" described earlier in this chapter for slots in which boards can be installed.

From Installation to Setting

For the installation of the SCSI controller board, see "PCI board". The DISK access lamp on the front panel of the server indicates the access status of the hard disk drive connected to the SCSI controller board. Before the access status can be indicated, the LED connector on the SCSI controller board and the LED connector on the mother board must be connected through the LED cable supplied with the Express server.
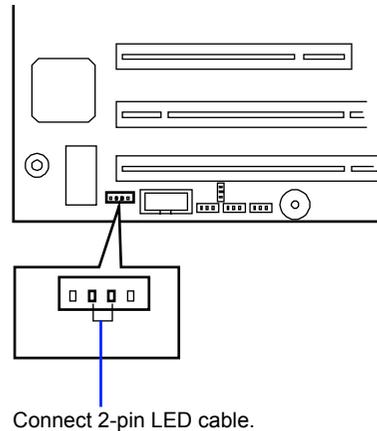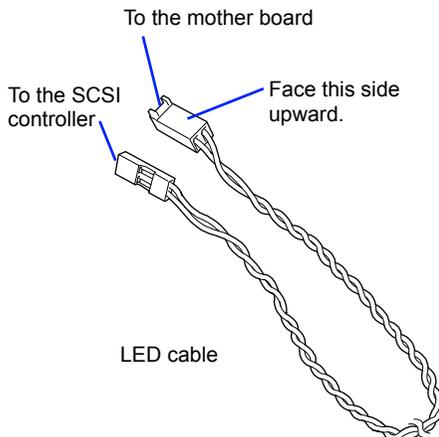
- Mother Board

  The LED connector is at the position shown in the figure below. It can be connected in either direction.

- SCSI Controller Board

  The red cable of the LED cable comes out from the connector hole. Connect the connector hole to "LED Active" of the LED connector on the disk array controller board.   For the position of the LED Active pin, see the manual supplied with the disk array controller board.

For the connection of the interface cable, see the manual supplied with the SCSI controller board.

After installing the SCSI controller board, make settings such as the transfer rates of the board and connected devices, using the SCSI BIOS utility of the SCSI controller board. For details on the setting procedures, see the manual supplied with the SCSI controller board.

Processor

The mother board includes two Intel Xeon ZIF sockets. The primary and secondary processor sockets are located as shown in the figure below.

> **IMPORTANT:** Any CPU is easily affected by static electricity. Handle a CPU after making your body contact with a metallic frame section of the server to discharge the static electricity on your body. Do not make bare hands contact with the CPU pins.   In addition, do not put any CPU on a desk directly.   See "Static Precautions" for details of the static electricity.

Mother board
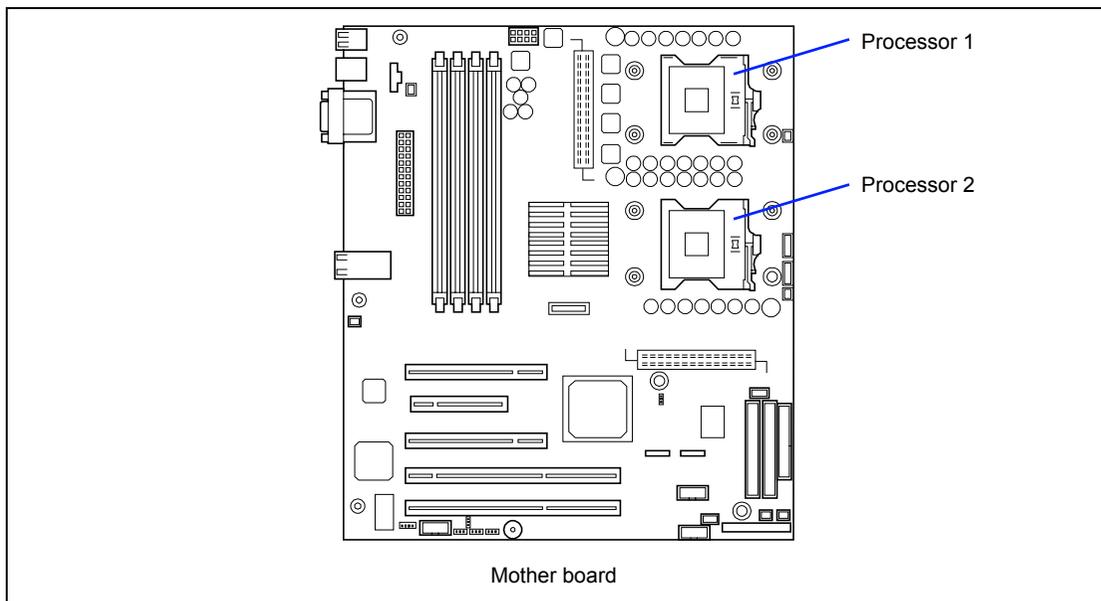
> **NOTE:** If the different revision of the processor is installed in the multiprocessor system, Windows logs the following information every startup. If this message is logged, it is no problem for operation.
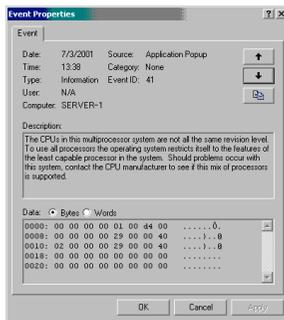
Installation

Install a CPU in the following procedure.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.

2. Remove the components as follows:

   - Side cover
   - Processor air duct

3. Locate the CPU socket which you are going to install CPU.

4. Raise the locking lever on the socket.

   > **IMPORTANT:** Open the lever until it stops. The bar can be opened to approx. 120 degrees.
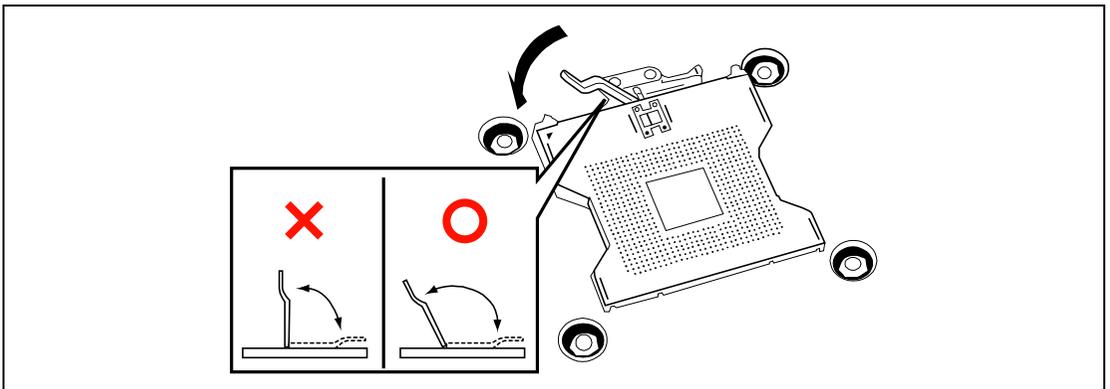
5. Aligning the pins of the CPU with the socket, insert the CPU slowly and gently into the socket.

   > **IMPORTANT:** Be aware of CPU direction. Pin layouts on two corners among four differ from others to prevent an incorrect insertion. Confirm the pin mark and pin layout on the socket, and insert the CPU correctly.
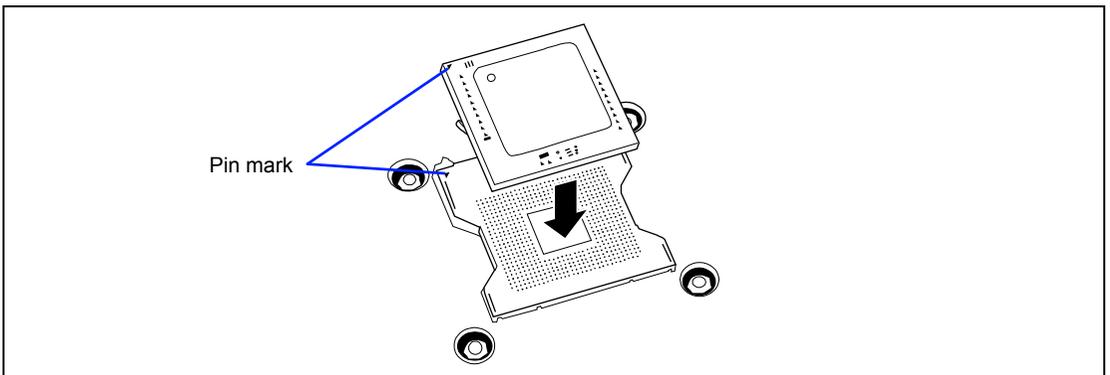
6.   Push the CPU lightly to the socket, and push down the lever to secure the CPU.
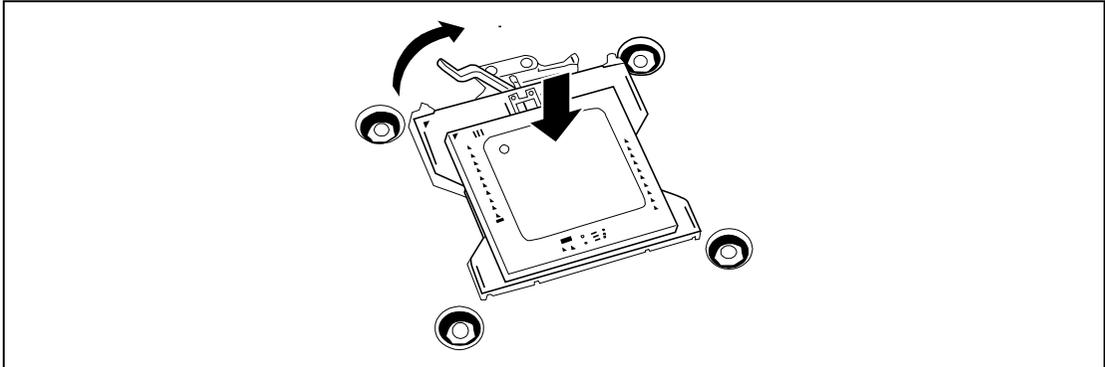
7.   Put the heat sink on CPU.

> **NOTE:** Be aware of direction of heat sink (see figure below).
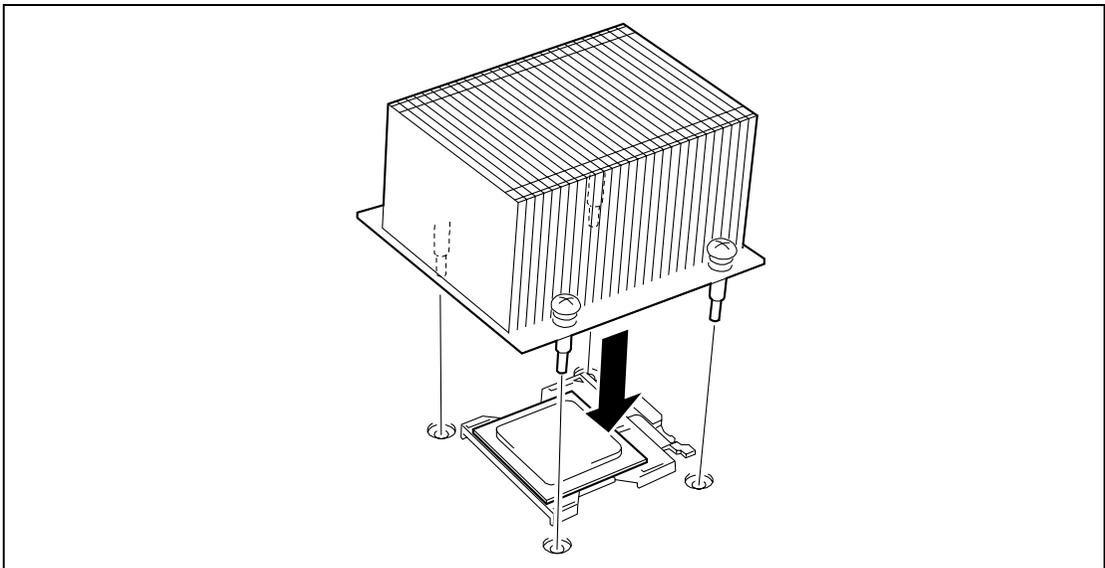
8. Secure four screws to fix the heat sink.

> **NOTE:** Tighten four screws temporarily in the following order shown in the figure below, and then completely tighten all screws.
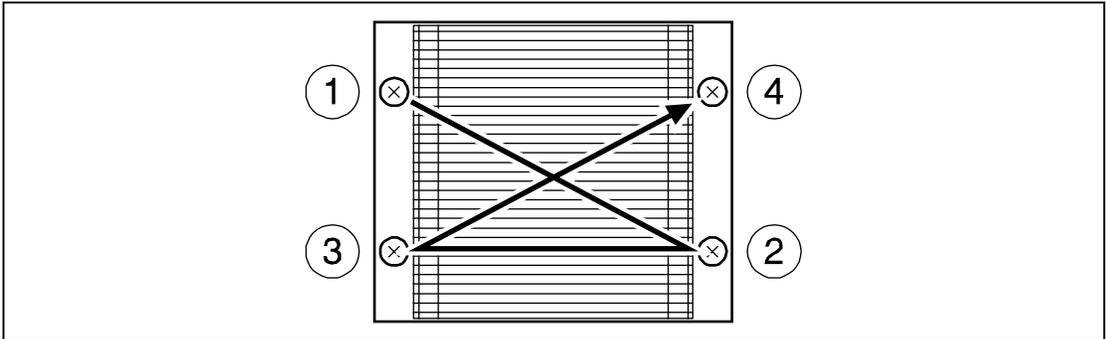
9. Make sure that the heat sink is level.

> **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.
>
>   – The wire clip is not engaged correctly.
>
> - Do not move the secured heat sink.

10. Install the components you removed previously.

11. Power on the server.

12. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive and reboot the system.

After rebooting the system, the NEC EXPRESSBUILDER menu appears on the screen.

13. Click [End], and select [DOS].

14. Enter as "cd SDR" against the prompt "Q:\>" and press **Enter**.

15. Enter as "SDRUP" against the prompt "Q:\SDR>" and press **Enter**.

16. Updating the configuration data is started.

If the following message is displayed on the way, press **Enter** to continue updating.

Password (Q to quit):

It takes about five to six minutes to complete updating.

17. When the message "Programming complete, reboot server for normal operation" appears, take out the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive, and press the Reset button or cycle the power to reboot the system. (Resetting by **Ctrl** + **Alt** + **Del** will not correctly update the configuration data.)

18. Start SETUP and select [Server] → [Event Log Configuration] → [Clear All Event Logs] to clear the event logs (see Chapter 4).

19. 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.

20. To add one or more CPUs to the server in 1-CPU configuration to operate the server with more than one CPU, do the procedure below:

For Windows Server 2003 and Windows 2000, change the driver of [Computer] in the device manager to [ACPI multi-processor PC] and then update the system (see Chapter 5).

Removal

To remove the CPU, prepare the removal referring to steps 1 and 7 in the installation procedure and do the reverse procedure of steps 12 to 8.   Remove the heat sink by using a flat-tip screwdriver for the fixing metal fitting.

> **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 may cause the CPU and/or socket to be defected.

Do the following procedure if a CPU is removed (or replaced).

1. Update the configuration data according to Steps 11 to 17 described in the installation procedure.

You do not need to update the configuration data when you replaced the CPU.

While updating is in progress, the STATUS lamp goes on amber, however, it is not the problem. When you complete updating and reboot the system, the amber STATUS lamp will go off. If the amber STATUS lamp still goes on, some server failure is assumed.

2. After removing or reinstalling the processor, run the BIOS SETUP utility to observe the processor status (see Chapter 4 for detail).

DIMM

The DIMM (Dual Inline Memory Module) is installed in a DIMM socket on the mother board installed in the server.

The mother board contains six sockets in which DIMMs are installed.   Two 256MB DIMM is normally installed in DIMM #1A and #1B.   (The DIMMs normally installed may be replaced.)

DIMMs are installed on the sockets in the ascending order of DIMM socket numbers.
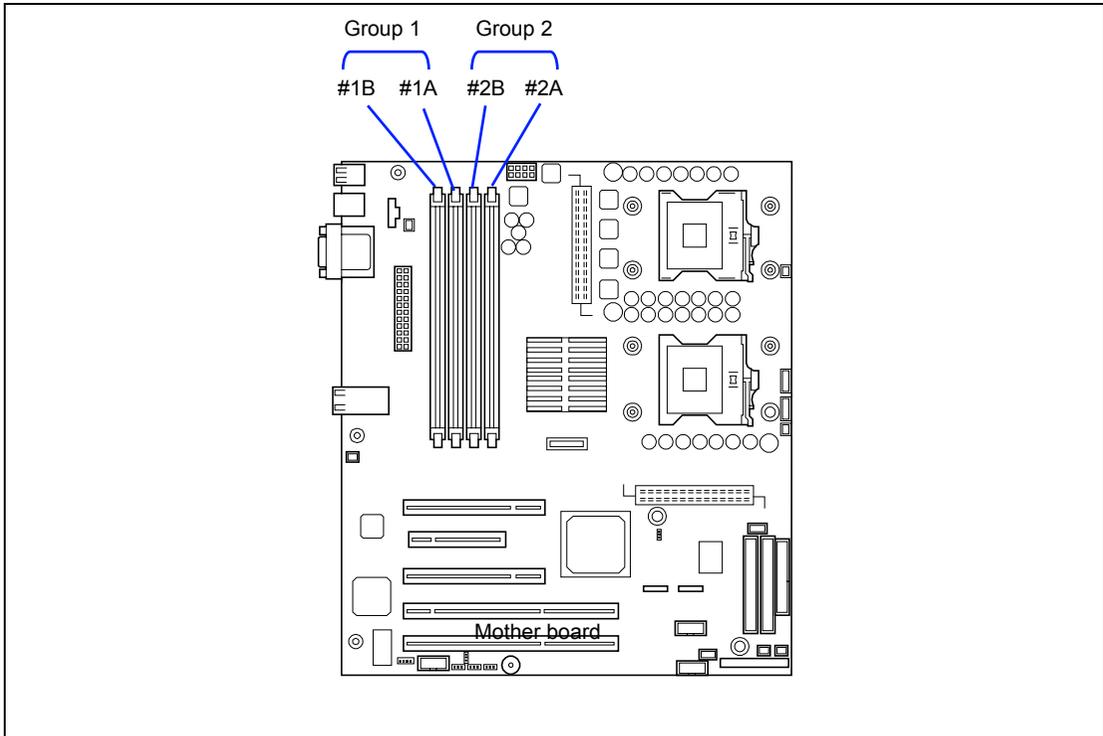
IMPORTANT:

■ The DIMM is easily affected by static electricity. Handle the DIMM after making your body contact with a metallic frame section of the server to discharge the static electricity on your body. Do not make bare hands contact with terminals and components on the DIMM. In addition, do not put the DIMM on a desk directly. See "Static Precautions" for details of the static electricity.

■ Do not use any DIMM not approved by NEC. If an unapproved third party's DIMM is installed in the server, not only the DIMM but also the server itself may be defected. You will be charged by any repair of a malfunction or defect caused by such a device within the warranty period.

■ Due to an interleave device, add two DIMMs in groups The server does not operate if DIMMs of different specifications * are installed in the same group.

   * The specification of a DIMM is described on the label put on the board as follows:

    Example: Frequency of 333 MHz, buffered, capacity of 512 MB, raw address of 12 bits, column address of 10 bits, and single side
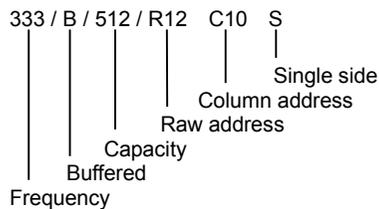
    333 / B / 512 / R12   C10   S
                            Single side
                    Column address
               Raw address
         Capacity
      Buffered
    Frequency

■ DIMMs must be populated in pairs and in the following order: #1A and #1B, and then #2A and #2B.

■ Install DIMMs starting from the one having largest capacity.

■ In a maximum configuration, the larger memory size of DIMMs must be installed in the slots #2A and #2B.

■ Installed DIMMs must be the same speed and must all be registered.

■ Take a note of beep code pattern, and take appropriate action according to the table listed earlier in "Beep Codes".

NOTES:

■ Up to 8GB (2GB × 4) of memory can be added.

■ In the error messages and logs in POST, NEC ESMPRO Manager, or Off-line Maintenance Utility, the DIMM connector may be called group. The number next to a group meets the connector number in the figure shown in the previous page.

Installation

Install a DIMM in the following procedure.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.

2. Remove the components as follows:

    ■ Side cover

    ■ Processor air duct

3. Confirm the socket in which a DIMM is installed.

4. Open the levers at both ends of the socket.
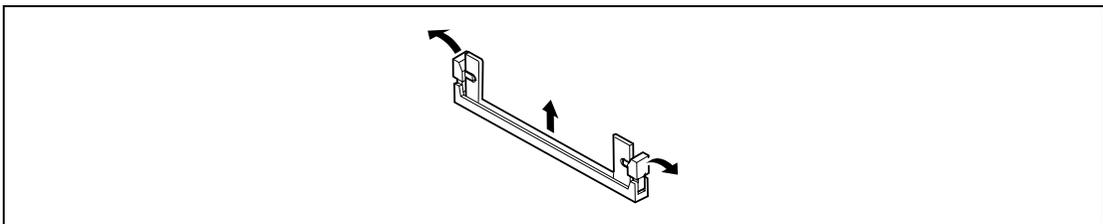
> **IMPORTANT:** To avoid damaging the lever, do not apply an excess force to the lever.

5. Push the DIMM to the socket straight.

> **NOTE:** Use extreme care when installing a DIMM. Applying too much pressure can damage the socket. Keyed DIMMs insert only one way.

If the DIMM is inserted into the DIMM socket, the lever is automatically closed.
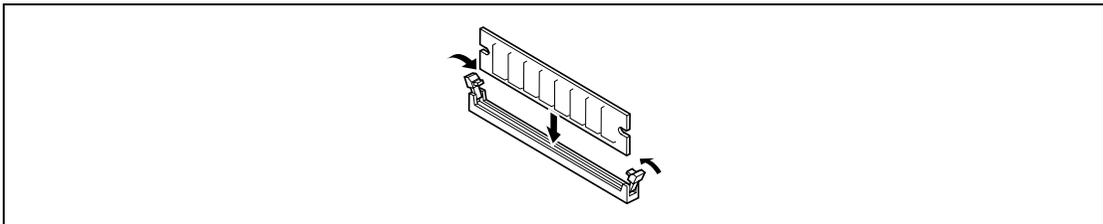
6. Gently push the levers to the upright position until they engage the notches in the DIMM.

7. Install the remove components.

8. Turn on the power of the server.   Then make sure that any error message does not appear in POST.

If an error message appears, write down the message and review the error message list in Chapter 8.

9. Start SETUP to select "Advanced" → "Memory Configuration" on menus.   Then make sure that the status of the additional DIMM is set to "Normal" (see Chapter 4).

10. When Windows 2003/2000 is used, set the paging file size to the recommended value or larger.

Installed memory capacity × 1.5 for Windows 2003/2000 (See Chapter 5.)

Removal

Remove the DIMM depending on the following procedure.

> **NOTES:**
>
> ■ To remove the defected DIMM, check the error message appearing in POST or NEC ESMPRO to identify the DIMM socket (group) in which the defected DIMM is installed.
>
> ■ The server operates only when at least one DIMM is installed.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.

2. Remove the side cover.

3. Expand the levers at the both ends of the socket for the DIMM to be removed leftward or rightward

The lock is released to allow the DIMM to be removed.
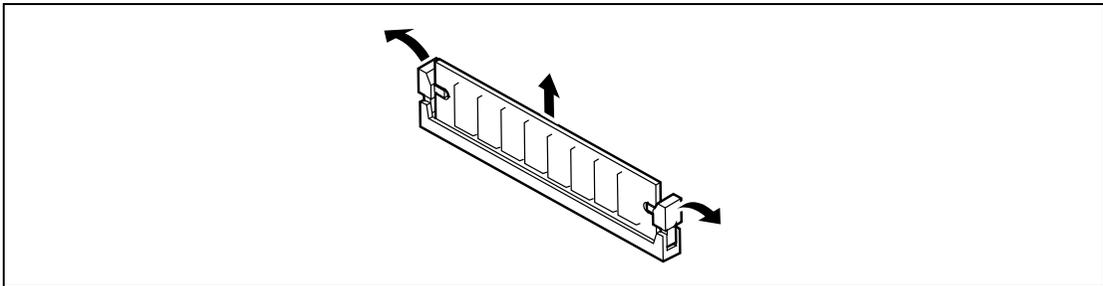
4. Install the components removed in step 2.

5. Turn on the power of the server.   Then make sure that any error message does not appear in POST.

If an error message appears, write down the message and review the error message list in Chapter 8.

6. Start the SETUP to select "Advanced" → "Memory Configuration" → "Memory Retest" on the menus to clear the error information on the removed DIMM (see Chapter 4).

Chapter 10

Internal Cabling Diagrams

Internal cable connections of the server are shown below.

INTERFACE CABLES

An example of the connections of interface cables between devices within the server and external devices is shown below.

Standard Configuration

The following shows an example of connection in the standard configuration:

The mother board has two serial ATA (SATA) connectors. "IDE" in the figure below is the primary channel of Ultra ATA66 for the standard CD-ROM drive and optional PATA device.
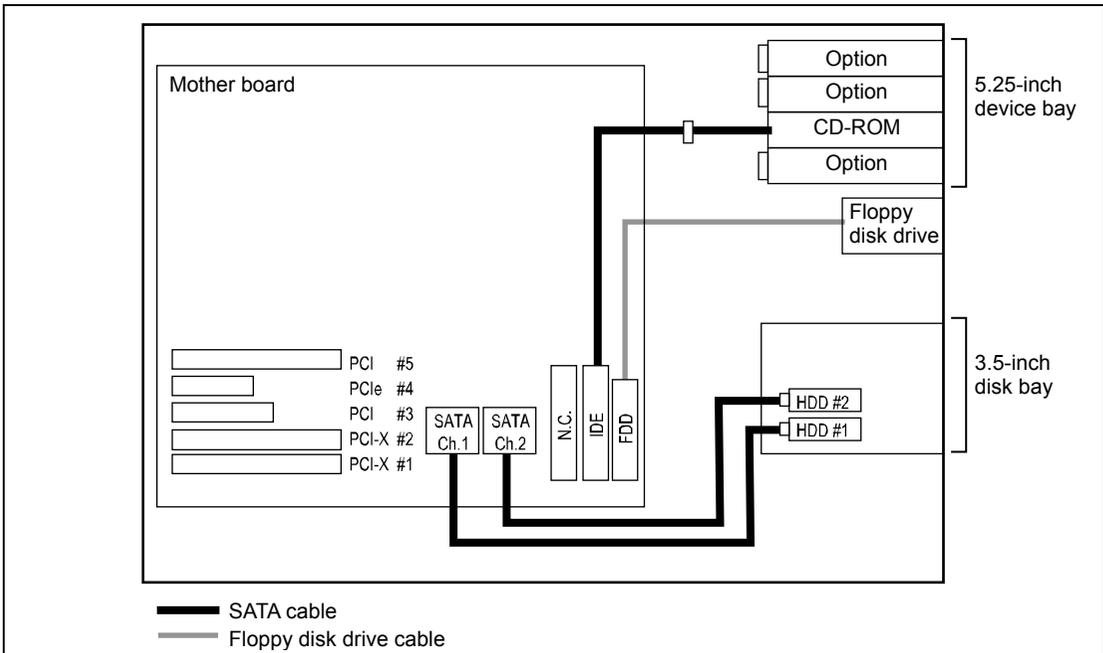
SATA RAID Drive Configuration

Your server can contain up to four SATA hard disk drives if an optional SATA RAID controller is installed.

You can configure the RAID controller with RAID levels of JBOD, RAID0, RAID1, and RAID5 by running the RAID configuration utility.

Four explanations of RAID technology and utility, refer to the manual that was shipped with the RAID controller.
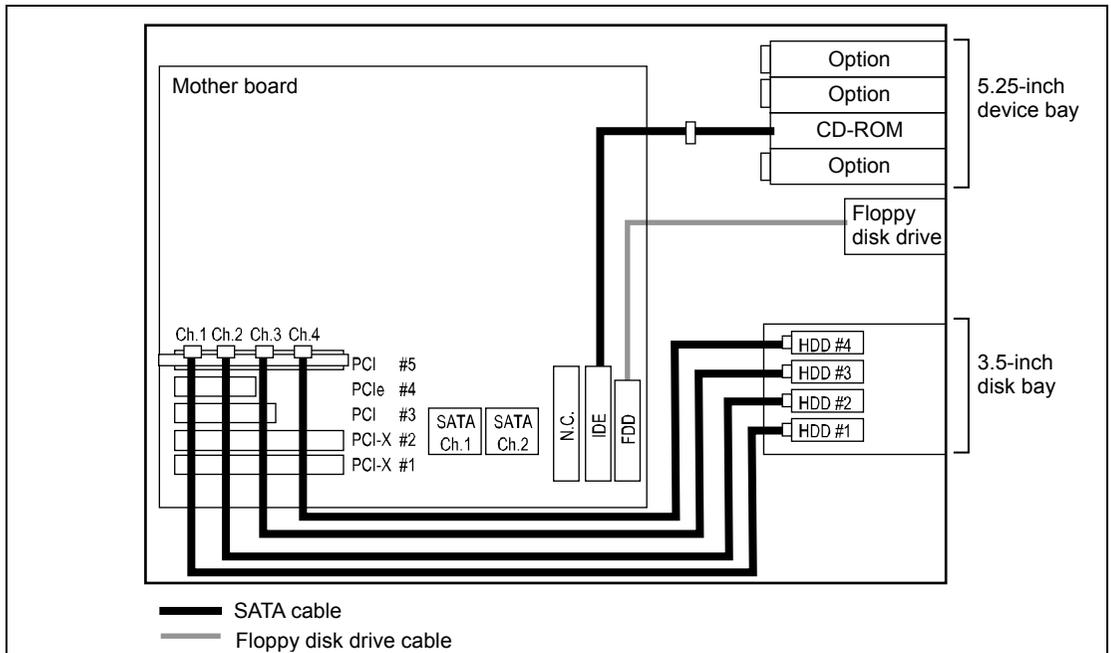
SCSI Hard Disk Drive Configuration

You need an optional SCSI controller and internal SCSI cable to install a SCSI hard disk drive or file device.

Set SCSI IDs as shown in the figure below. Set the terminating resistor (Enabled/Disabled) for the last-connected device in the SCSI chain. Set "Disabled" for all the middle devices. A terminating connector may be installed depending on the internal SCSI cable. If the SCSI cable ends with a terminating resistor, set "Disabled" for all the terminating resistors of connected devices. For the settings, see the manual provided with each device.

A file device needs settings such as a SCSI transfer rate. For the transfer rate, see the manual provided with the file device. Use the BIOS utility of the SCSI controller to make the settings. For details, see the manual provided with the SCSI controller.
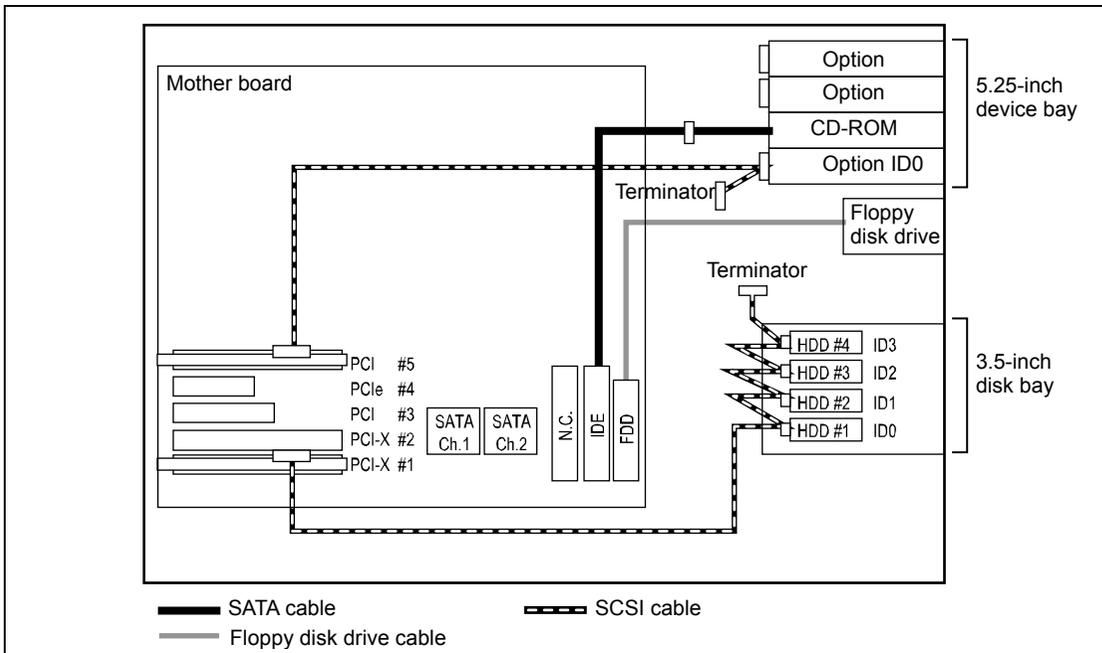
An optional SCSI controller (N8103-65F) is available for continuous connection of the SCSI cable from a hard disk drive to a file device. A maximum of three SCSI hard disk drives and one SCSI backup device can be connected with one SCSI controller.

This server does not guarantee operation with SCSI and IDE hard disk drives being mixed. Use only either of the interfaces.
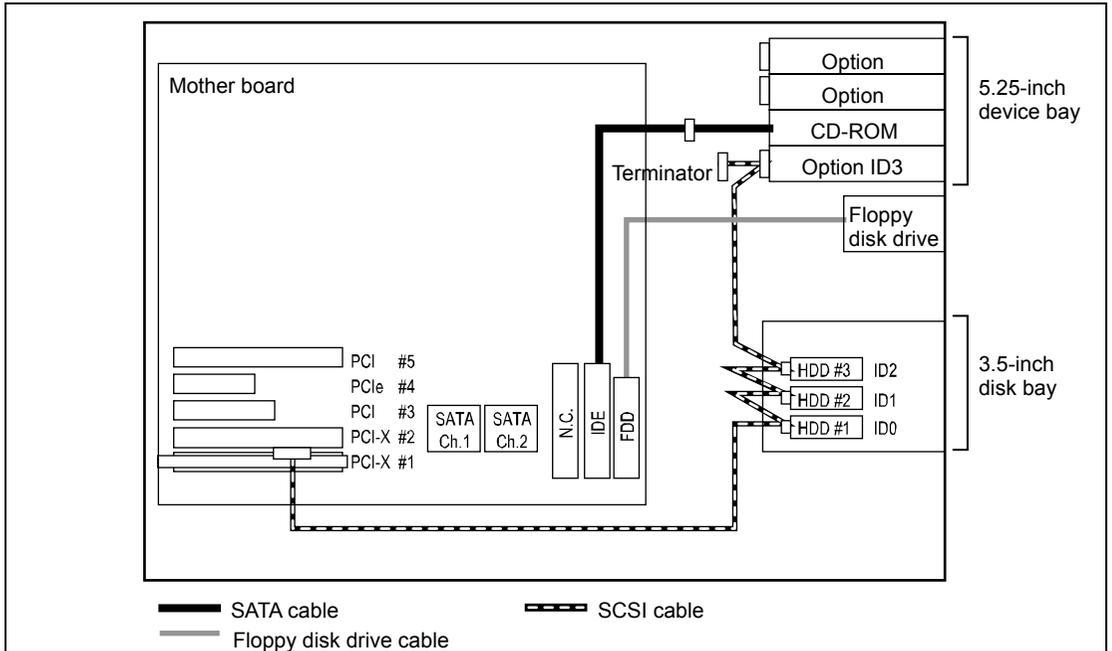
SCSI RAID Drive Configuration

Your server can contain up to four SCSI hard disk drives if an optional SCSI RAID controller is installed.

You can configure the RAID controller with RAID levels of RAID0, RAID1, and RAID5 by running the RAID configuration utility.

Four explanations of RAID the technology and utility, refer to manual that was shipped with the RAID controller.
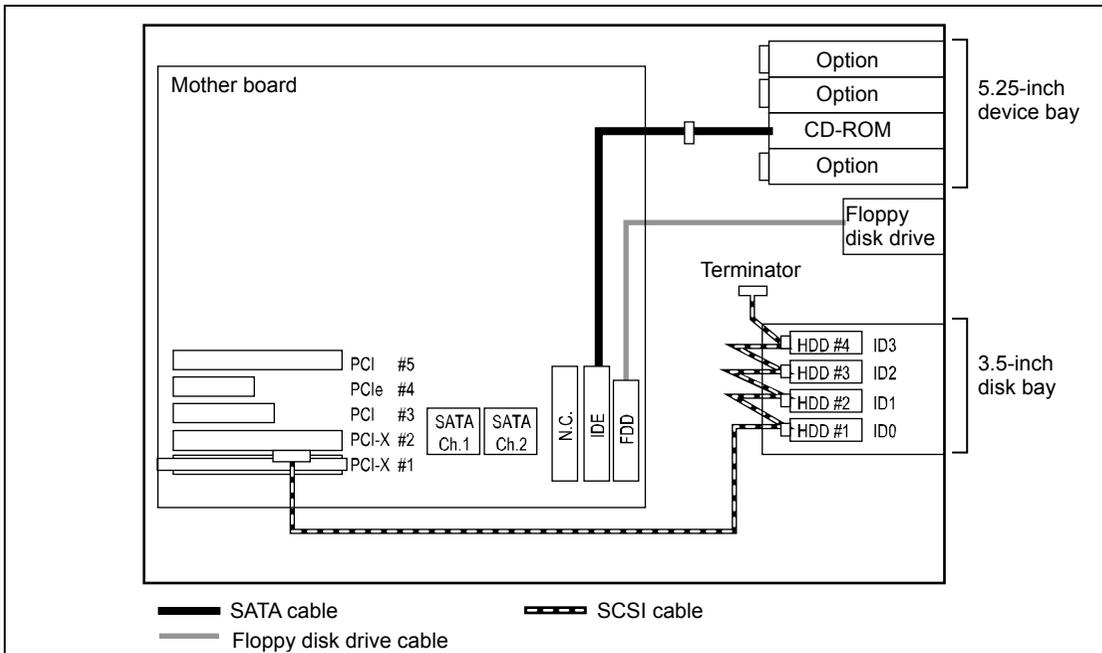
Hot-plug SCSI RAID Drive Configuration

The optional SCSI RAID controller, hot-plug SCSI HDD bay and SCSI cable allow your server to contain a maximum of six hot-plug SCSI hard disk drives as shown in the figure below. The hard disk drives installed in the HDD bay are controlled by the SCSI RAID controller with each of the RAID level of RAID, RAID1 or RAID5.

Also, you can add a new hard disk drive or replace a failed hard disk drive with a new one without powering down the system.
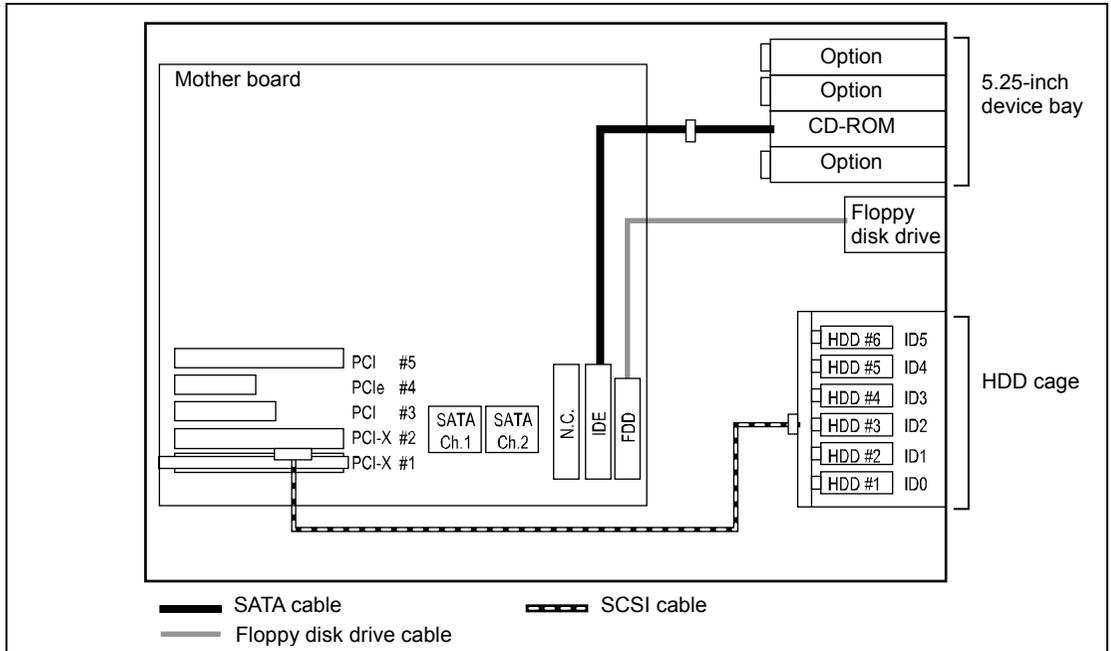
POWER CABLE

Proper connector numbers of format Pnn (nn: numeral) are printed on the power cables connected to the power unit installed in the server.   The connector numbers and the built-in devices to which the connectors are connected are shown in the figures below.

Standard Configuration
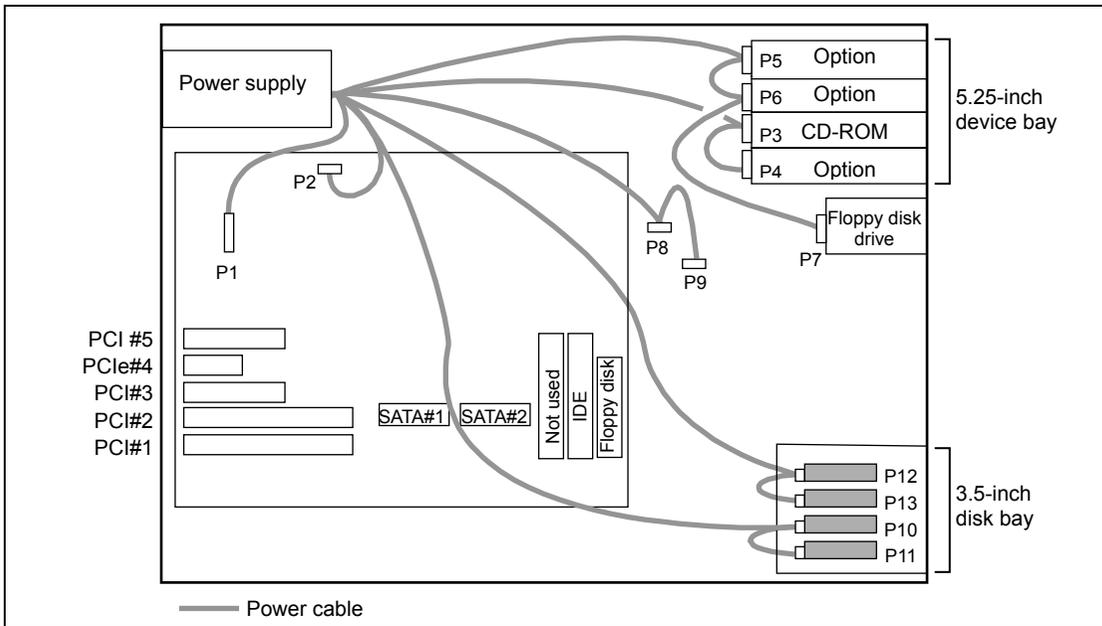
Hot-plug SCSI RAID Drive Configuration
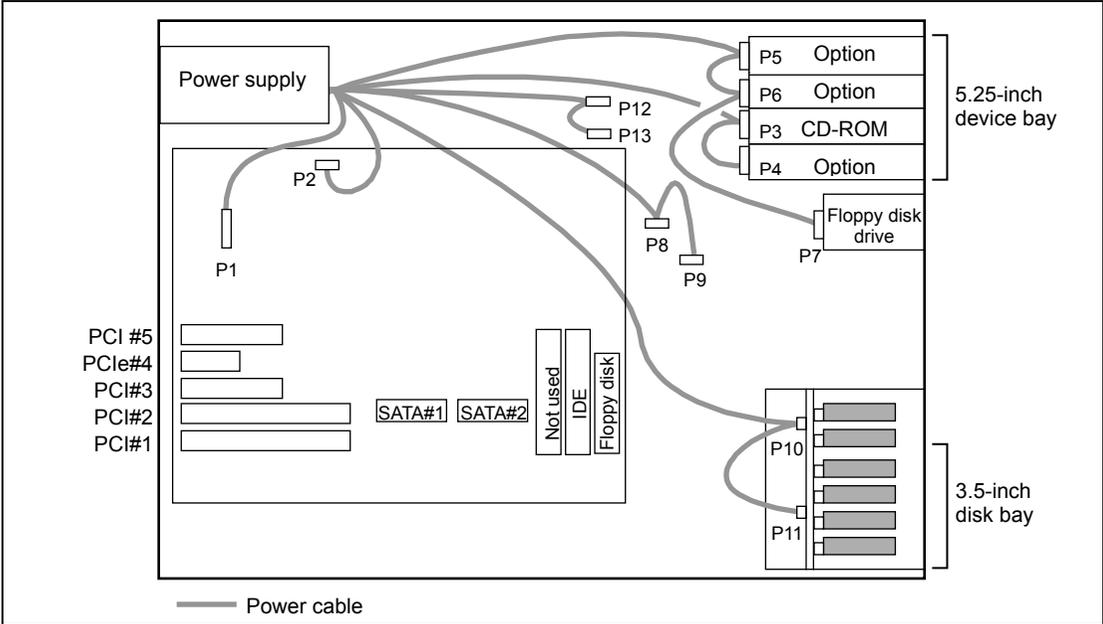
(This page is intentionally left blank.)

Appendix A

Specifications

Item		NEC Express5800/120Eg	
		N8100-1078F	N8100-1079F
CPU	Type	Intel® Xeon™ processor (3.20DGHz/1MB)	Intel® Xeon™ processor (3.60GHz/2MB)
	Standard	1	
	Maximum	2	
Chipset		Intel E7320	
Memory	Standard	512 MB (256 MB × 2)	
	Maximum	8 GB (The standard DIMM must be replaced.)	
	Expansion unit	2 DIMMs (512/1024/2048MB)	
	Expansion times	1 time	
	Memory module	SDRAM DIMM (DDR333, Buffered type, Registered)	
	Error check	ECC	
Graphics (VRAM)		ATI RAGE XL (VRAM 8MB)	
Auxiliary input device	Floppy disk (standard)	3.5-inch drive × 1 (standard)	
	Hard disk (standard)	None	
	Hard disk (maximum)	Factory-installed (SATA): 500GB (250GB×2) Option (SATA RAID): 1TB (250GB×4) Option (SCSI/SCSI RAID): 1.2TB (300GB×4) Option (SCSI RAID + HDD cage): 1.8TB (300GB×6)*	
	RAID	Option	
	Hot-plug	Option (SCSI)	
	CD-ROM (standard)	ATAPI interface × 1 (x40 speed)	
5.25-inch file bay		4 slots (A standard CD-ROM drive is installed. Maximums of two backup file devices are installed.)	
3.5-inch disk bay		4 slots (6 slots max.*)	
Additional slot	PCI (64-bit/66MHz)	2 slots	
	PCI (32-bit/33MHz)	2 slots	
	PCI EXPRESS (x4)	Cannot be used	
LAN interface		1000BASE-T/100BASE-TX/10BASE-T × 1	
External interface	Keyboard	MINI DIN 6-pin connector (1 port)	
	Mouse	MINI DIN 6-pin connector (1 port)	
	USB	4-pin (2 ports)	
	Serial	D-sub 9-pin (2 ports)	
	Network	RJ-45 (1 port)	
	Display	MINI D-sub 15-pin (1 port)	
Cabinet design		Desk-side, mini tower	
External dimensions		292.1* (width) × 453 (height) × 681 (depth) mm * including stabilizers	
Weight (Max.)		23 kg (33 kg)	
Power supply		100 to 120 VAC ±10%, 200 to 240 VAC ±10%, 50/60 Hz ±1 Hz	
Power consumption		640 VA, 625 W	
Environmental requirements	Temperature	10 to 35°C (operating), -10 to 55°C (non-operating, storage)	
	Humidity	20 to 80% RH (no condensation)	
Others		NEC EXPRESSBUILDER supported, NEC ESMPRO provided in the standard configuration	

* The optional hot-plug HDD cage is installed.

(This page is intentionally left blank.)

Appendix B

Other Precautions

Transfer Rate of the On-board LAN Controller

The onboard network interface controller supports 10Base-T, 100Base-TX, and 1000Base-T 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 & Duplex" value the same as the value specified for HUB.

Server Management Software

The NEC EXPRESSBUILDER CD-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.
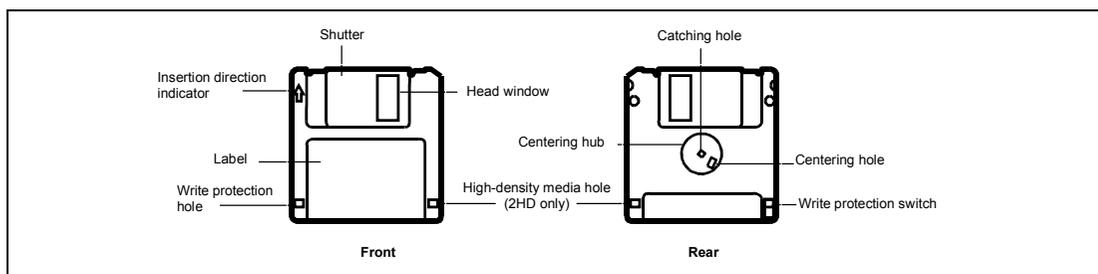
Notes on use

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.

Write-protection
notch

Write
disabled
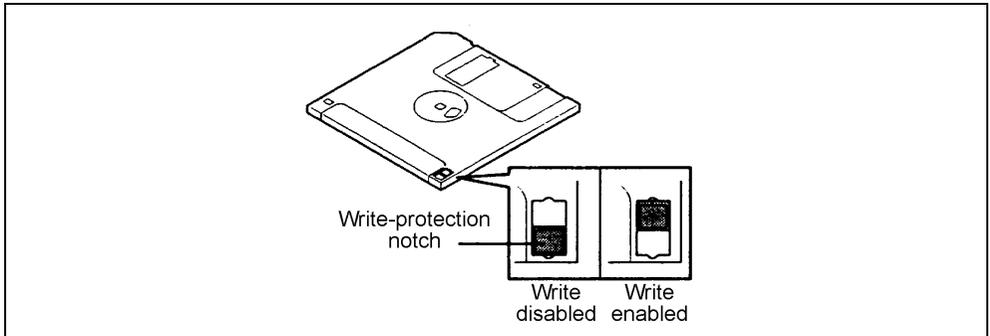
Write
enabled

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.

CD-ROM

Keep the following notes in mind to use the CD-ROM for the server:

- Press the center of the storage case to remove the CD-ROM from the case.

- Do not drop the CD-ROM.

- Do not place anything on the CD-ROM or bend the CD-ROM.

- Do not attach any label onto the CD-ROM.

- Do not touch the signal side (nothing is printed on this side) with your hand.

- Place the CD-ROM with its printed side upward and gently put it on the tray.

- Do not scratch the CD-ROM or write anything directly on it with a pencil or ball-point pen.

- Do not leave the CD-ROM with foods and drinks, or in a place exposed to cigarette smoke.

- Do not leave the 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 CD-ROM, wipe the CD-ROM from its center to edge with a dry soft cloth slowly and gently.

- Use the CD cleaner to clean the CD-ROM.   Do not use record spray/cleaner, benzene, or thinner.

- Keep the CD-ROM in a CD-ROM 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.
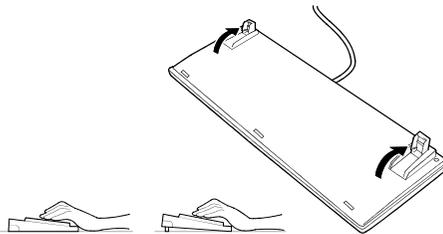
NOTE: The keyboard functions depend on the software.   Refer to the manual that comes with the software for details.

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.
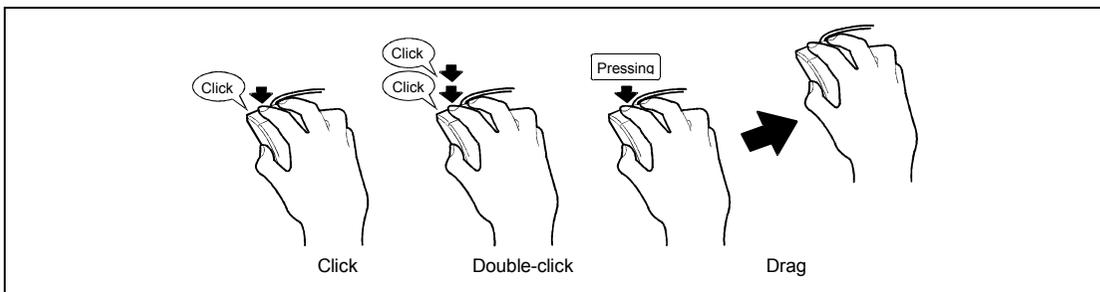
Appendix C

IRQ and I/O Port Address

The factory-set interrupt requests and I/O port addresses 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	8	Real-time clock
1	Keyboard	9	Reserved
2	Reserved	10	Reserved
3	COMB serial port (PCI)	11	Reserved
4	COMA serial port (PCI)	12	Mouse
5	Reserved	13	Numeric processor
6	Floppy disk	14	P-IDE
7	Reserved	15	S-IDE

I/O Port Address

The factory-set I/O port addresses for the server are assigned as follows:

Address(es)	Resource	Notes
0000h – 000Fh	DMA Controller 1	
0010h – 001Fh	DMA Controller 2	Aliased from 0000h – 000Fh
0020h – 0021h	Interrupt Controller 1	
0022h – 0023h		
0024h – 0025h	Interrupt Controller 1	Aliased from 0020 – 0021h
0026h – 0027h		
0028h – 0029h	Interrupt Controller 1	Aliased from 0020h – 0021h
002Ah – 002Bh		
002Ch – 002Dh	Interrupt Controller 1	Aliased from 0020h – 0021h
002Eh – 002Fh	Super I/O (SIO) index and Data ports	
0030h – 0031h	Interrupt Controller 1	Aliased from 0020h – 0021h
0032h – 0033h		
0034h – 0035h	Interrupt Controller 1	Aliased from 0020h – 0021h
0036h – 0037h		
0038h – 0039h	Interrupt Controller 1	Aliased from 0020h – 0021h
003Ah – 003Bh		
003Ch – 003Dh	Interrupt Controller 1	Aliased from 0020h – 0021h
003Eh – 003Fh		
0040h – 0043h	Programmable Timers	
0044h – 004Fh		
0050h – 0053F	Programmable Timers	
0054h – 005Fh		
0060h, 0064h	Keyboard Controller	Keyboard chip select from 87417
0061h	NMI Status & Control Register	
0063h	NMI Status & Control Register	Aliased
0065h	NMI Status & Control Register	Aliased
0067h	NMI Status & Control Register	Aliased
0070h	NMI Mask (bit 7) & RTC address (bits 6::0)	
0072h	NMI Mask (bit 7) & RTC address (bits 6::0)	Aliased from 0070h
0074h	NMI Mask (bit 7) & RTC address (bits 6::0)	Aliased from 0070h
0076h	NMI Mask (bit 7) & RTC address (bits 6::0)	Aliased from 0070h
0071h	RTC Data	
0073h	RTC Data	Aliased from 0071h
0075h	RTC Data	Aliased from 0071h
0077h	RTC Data	Aliased from 0071h
0080h – 0081h	BIOS Timer	
0080h – 008F	DMA Low Page Register	
0090h – 0091h	DMA Low Page Register (aliased)	
0092h	System Control Port A (PC-AT control Port) (this port not aliased in DMA range)	
0093h – 009Fh	DMA Low Page Register (aliased)	
0094h	Video Display Controller	
00A0h – 00A1h	Interrupt Controller 2	
00A4h – 00A5h	Interrupt Controller 2 (aliased)	
00A8h – 00A9h	Interrupt Controller 2 (aliased)	

Address(es)	Resource	Notes
00ACh – 00ADh	Interrupt Controller 2 (aliased)	
00B0h – 00B1h	Interrupt Controller 2 (aliased)	
00B4h – 00B5h	Interrupt Controller 2 (aliased)	
00B8h – 00B9h	Interrupt Controller 2 (aliased)	
00BCh – 00BDh	Interrupt Controller 2 (aliased)	
00C0h – 00DFh	DMA Controller 2	
00F0h	Clear NPX error	Resets IRQ13
00F8h – 00FFh	X87 Numeric Coprocessor	
0102h	Video Display Controller	
0170h – 0177h	Secondary Fixed Disk Controller (IDE)	
01F0h – 01F7h	Primary Fixed Disk Controller (IDE)	
0200h – 0207h	Game I/O Port	
0220h – 022Fh	Serial Port A	
0238h – 023Fh	Serial Port B	
0278h – 027Fh	Parallel Port 3	
0290h – 0298h	NS HW monitor	
02E8h – 02EFh	Serial Port B	
02F8h – 02FFh	Serial Port B	
0338h – 033Fh	Serial Port B	
0370h – 0375h	Secondary Floppy	
0376h	Secondary IDE	
0377h	Secondary IDE/Floppy	
0378h – 037Fh	Parallel Port 2	
03B4h – 03Bah	Monochrome Display Port	
03BCh – 03BFh	Parallel Port 1 (Primary)	
03C0h – 03CFh	Video Display Controller	
03D4h – 03Dah	Color Graphics Controller	
03E8h – 03Efh	Serial Port A	
03F0h – 03F5h	Floppy Disk Controller	
03F6h – 03F7h	Primary IDE – Sec Floppy	
03F8h – 03FFh	Serial Port A (primary)	
0400h – 043Fh	DMA Controller 1, Extended Mode Registers	
0461h	Extended NMI / Reset Control	
0480h – 048Fh	DMA High Page Register	
04C0h – 04CFh	DMA Controller 2, High Base Register	
04D0h – 04D1h	Interrupt Controllers 1 and 2 Control Register	
04D4h – 04D7h	DMA Controller 2, Extended Mode Register	
04D8h – 04DFh	Reserved	
04E0h – 04FFh	DMA Channel Stop Registers	
051Ch	Software NMI (051Ch)	
0678h – 067Ah	Parallel Port (ECP)	
0778h – 077Ah	Parallel Port (ECP)	
07BCh – 07Beh	Parallel Port (ECP)	
0CF8h	PCI CONFIG_ADDRESS Register	
0CF9h	Intel® Server Board SUNPRAIRIE Turbo and Reset Control	
0CFCh	PCI CONFIG_DATA Register	

(This page is intentionally left blank.)

Appendix D

Installing Windows Server 2003 x64 Editions

This section describes the procedures for installing Windows Server 2003 x64 Editions without using ExpressSetup tool.

BEFORE INSTALLING WINDOWS SERVER 2003 x64 EDITIONS

Read carefully the following information BEFORE commencing your Windows Server 2003 x64 Editions Installation.

Optional Board Supported by NEC EXPRESSBUILDER

The NEC EXPRESSBUILDER CD-ROM attached to your system supports the following optional boards;

- Supporting installation of OS in NEC EXPRESSBUILDER
  - N8103-75F SCSI Controller
  - N8103-80F Disk Array Controller (SCSI 1ch)
  - N8103-95 SCSI Controller
  - SATA HostRAID (Onboard Adaptec HostRAID controller)
- Other optional boards
  - N8103-56F SCSI Controller

Updating System

If you change the configuration of the system, update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

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.

Manual Installation when SATA HostRAID and N8103-75/80F/95 Keeps Connection

If you keep those controllers connecting during installation process, pop-up messages may appear. This does not affect on system behavior. Click [YES] and continue the installation. Follow the message hereafter.

MO Device

If you specify the file system as NTFS with MO Device connected during the installation, the file system will not be converted normally.   Disconnect MO Device and restart the installation from the beginning.

Media such as DAT

During the OS installation, do not attach the unnecessary media for OS installation to the system, such as DAT.

Partition Size

The size for the partition that the system is to be installed can be calculated from the following formula.

Size necessary to install the system + Paging File Size + Dump File Size
+ Application Size

Size necessary to install the system = 4100MB

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.

- The dump file size for the system with more than 2GB memory mounted is '2048MB + 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 512MB, the partition size will be calculated by the above formula as follows:

4100MB + (512MB * 1.5) + (512MB + 1MB) + Application Size
= 5381MB + 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 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 CD-ROM

- Microsoft Windows Server 2003, Standard x64 Edition (CD-ROM)

- User's Guide

- Getting Started

- Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER

Creating "Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER"

Before installing, create Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER.

> **NOTE:** If you have already "Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER" for NEC Express5800 Server which you are going to install Windows Server 2003 x64 Edition, you do not need to create it again.

You can create Windows Server 2003 x64 Edition OEM-DISK for NEC 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 NEC EXPRESSBUILDER, use this procedure.

    If Windows Server 2003 or Windows 2000 can be operated on NEC Express5800 Server, you can use the other procedure described later.

    Follow the steps below.

1. Prepare one 3.5-inch floppy disk.

2. Turn on your NEC Express5800 Server.

3. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.

4. Press the RESET switch or press **Ctrl** + **Alt** + **Delete** to reboot the server. (You may also turn off and then on again to reboot the server.)

    The system will boot from the CD-ROM and NEC EXPRESSBUILDER starts.

5. Select [Create Support Disk] from [Tools].

6. Select [Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER] from [Create Support Disk] menu.

7. Insert a floppy disk into the floppy disk drive according to the instruction on the screen.

Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER will be created.

Write-protect and attach a label, then keep it safely.

■ Create from [Master Control Menu]

[Master Control Menu] runs on the following operating systems.

– Windows Server 2003 x64 Editions

– Windows Server 2003

– Windows 2000

– Windows Me/98/95

– Windows NT 4.0

– Windows XP x64 Edition

– Windows XP

You can create Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER from [Master Control Menu], if you have the computer on which the above operating systems operate.

Follow the steps below.

1. Prepare one 3.5-inch floppy disk.

2. Run the operating system.

3. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.

[Master Control Menu] will appear.

4. Click on [Setup] with left mouse button and click [Make OEM-DISK] and then [for Windows Server 2003 x64].

> **NOTE:** You can do the same operation with the menu appeared by the Right-click.

5. Insert the floppy disk into the floppy disk drive according to the message.

Windows Server 2003 x64 Edition OEM-DISK for NEC 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.

1. Turn on the system power.

2. Insert the Windows Server 2003 CD-ROM into the CD-ROM drive.

3. Press **Ctrl** + **Alt** + **Delete** to reset the system.

    After a bootable operating system has been installed on the hard disk, 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, 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 (including embedded HostRAID feature) or SCSI controller is installed in the system, press **F6** in a few seconds when the window is in either of the following states.

    – "Setup is inspecting your computer's hardware configuration ..." is displayed.

    – A screen with a solid blue background is displayed.

    > **IMPORTANT:** There is no visible indication on screen when **F6** has been pressed.

5. When the following message is displayed, press **S**.

    > 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.

    The following message is displayed.

    > Please insert the disk labeled
    > manufacturer-supplied hardware support disk
    > into Drive A:
    > *Press ENTER when ready.

6. Insert the Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER into the floppy disk drive, and press **Enter**.

    A list of mass storage devices is displayed.

7. Select the proper SCSI Adapter and press **Enter**.

- MegaRAID SCSI 320-1 RAID Controller Driver
  (When N8103-80F board is installed.)

- Adaptec SATA Driver v1.00 (Windows EM64T/AMD64 for 2003)
  (When HostRAID is installed.)

Continue performing tasks according to the subsequent messages that appear.

After installation is completed, be sure to execute the tasks described in "Driver Installation and Advanced Settings" and "Updating the System" of this manual.

This subsection describes the procedure for reinstalling the operation system if the 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:

```
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 earlier in this chapter.

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 modify with the following procedure.

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 Path...].

4. Click [Yes].

5. Choose the [Assign a 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 may cause programs to no longer run. Are you sure you want to change this drive letter?

8. Close the [Computer Management].

Updating the System

To ensure normal system operation you should update your system using the following procedures.

1. Logon to the system using the administrator account or other account which is a member of the Administrators group.

2. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.

Master Control Menu is automatically appeared on the screen.

3. Click on [Setup] with left mouse button and click on [Update NEC Express5800 system] section.

4. Continue your work for system update as the following message.

5. Click on [Restart Computer] to restart the system.

6. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive immediately after clicking on [Restart Computer]

> **IMPORTANT:** If you change the configuration of the system (by adding or removing hardware or Operating system software components) or repair the system, you must run the system update again.

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.

PROSet

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 CD-ROM into the CD-ROM drive.

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.

    CD-ROM DriveLetter:\WINNT\W2K3AMD\NS1\PROSET\WS03_32E

    The [Intel(R) PROSet - Install Shield Wizard] dialog starts.

4. Click [Next].

5. Choose "I accept the terms in the license agreement" and click [Next].

6. Click [Install].

7. When [Install Shield Wizard Completed] window is displayed, click [Finish].

8. Restart the system.

Network Driver

Specify the details of network driver.

One standard network driver that is mounted will be installed automatically, but the link speed and Duplex mode need to be specified manually.

[When PROSet is not installed]

1. The [Local Area Connection Properties] dialog box appears.

* The procedure in the case of the standard start menu

1. Click Start menu, Click [Control Panel], Click [Network Connections], and Click [Local Area Connection].

* The procedure in the case of the classic start menu

1. Click Start menu, Click [Settings] and Click [Network Connections].

The [Network Connections] dialog box appears.

2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.

2. Click [Configure].

The property dialog box for network adapter appears.

3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

4. Click [OK] on the property dialog box for network adapter.

[When PROSet is installed]

1. Open the [Device Manager]

2. Double Click [(Network Adapter Name)] in the list.

3. Click the [Link] and specify the [Link Speed & Duplex Settings] value the same as the value specified for HUB.

4. Click [OK].

Also, add or delete any protocols and services if necessary.

You can operate the process on the property dialog box for local area network which can be appeared from [Network and Dial-up Connection].

> **NOTE:** We recommend you to add [Network Monitor] at [Adding Services]. [Network Monitor] can monitor the frame (or the packet) that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setting for Solving Problems" described later in this chapter.

Optional Network Board Driver

If you want to utilize optional Network Board (N8104-112/103/113), the network driver will be installed automatically. Therefore, the driver attached to the Network board should not be used.

If you want to utilize optional Network Board (N8104-86/111), install the driver stored in NEC EXPRESSBUILDER CD-ROM.

In case of utilizing (N8104-86/111)

> "CD-ROM Drive Letter:\WINNT\W2K3AMD\NS1\PRO100\WS03_32E"

If the procedure of installation is not clear, refer to the installation procedure described in the section "Installation of the Optional Network Board Driver".

Installation of the Optional Network 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 check off the [Search removable media (floppy, CD-ROM...)] check box.

6. Check the [Include this location in the search] check box and when using [(N8104-86/111)], specify [CD-ROM driveletter:\WINNT\W2K3AMD\NS1\PRO100\WS03_32E].

   Then click [Next].

7. Click [Finish].

Installing SCSI Controller Driver (N8103-75F/95)

If you utilize SCSI controller driver (N8103-75F/95), update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

The SCSI controller driver will be installed automatically.

Installing RAID Controller Driver (N8103-80F)

To additionally install the N8103-80F in a system containing Windows 2003, connect the controller and take the following steps to install the driver:

1. When the [Found New Hardware Wizard] dialog box appears, click [Next].

2. When the [Install Hardware Device Drivers] dialog box appears, select [Search for a suitable driver for my device (Recommended)], and click [Next].

3. When the [Locate Driver Files] dialog box appears, select [Floppy disk drives], insert "Windows Server 2003 x64 Edition OEM-DISK for EXPRESSBUILDER" into the floppy disk drive, and click [Next].

4. When the [Driver Files Search Results] dialog box appears, click [Next].

5. Copying of the driver is completed, and the [Completion of the new hardware detection wizard] dialog box below appears. Click [Complete].

SETTING FOR COLLECTING MEMORY DUMP (DEBUG INFORMATION)

Set for collecting memory dump using the procedure described in Chapter 5.

Appendix E

Installing Windows Server 2003

This section describes the procedures for installing Windows Server 2003 without using Express Setup tool.

BEFORE INSTALLING WINDOWS SERVER 2003

Please read carefully the following information BEFORE commencing your Windows Server 2003 Installation.

Optional Board Supported by NEC EXPRESSBUILDER

The NEC EXPRESSBUILDER CD-ROM attached to your system supports the following optional boards;

- ■ Supporting installation of OS in NEC EXPRESSBUILDER
  - – N8103-65F SCSI Controller
  - – N8103-75F SCSI Controller
  - – N8103-95 SCSI Controller
  - – N8103-78F Disk Array Controller (SATA)
  - – N8103-80F Disk Array Controller (SCSI 1ch)
  - – N8103-89 Disk Array Controller (SATA)
  - – SATA HostRAID (Onboard Adaptec HostRAID controller)
- ■ Other optional boards
  - – N8103-56F SCSI Controller

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 change the configuration of the system, update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

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.

Manual Installation when S-ATA HostRAID and N8103-65F/75/78F/80F/89 Keeps Connection

If you keep those controllers connecting during installation process, pop-up messages may appear. This does not affect on system behavior. Click [YES] and continue the installation. Follow the message hereafter.

MO Device

If you specify the file system as NTFS with MO Device connected during the installation, the file system will not be converted normally.   Disconnect MO Device and restart the installation from the beginning.

Media such as DAT

During the OS installation, do not attach the unnecessary media for OS installation to the system, such as DAT.

Partition Size

The size for the partition that the system is to be installed can be calculated from the following formula.

Size necessary to install the system + Paging File Size + Dump File Size
+ Application Size

Size necessary to install the system = 1000MB

Paging File Size (Recommended)   = Mounted Memory Size $\times$ 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 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 512MB, the partition size will be calculated by the above formula as follows:

1000MB + (512MB * 1.5) + 512MB + 12MB + Application Size
= 2292MB + 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 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 CD-ROM

- Microsoft Windows Server 2003 Standard Edition (CD-ROM)

- User's Guide

- Getting Started

- Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER

Creating "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER"

Before installing, create Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER.

> **NOTE:** If you have already "Windows Server 2003 OEM-DISK for
> NEC 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 NEC 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 NEC EXPRESSBUILDER, use this procedure.

  If Windows Server 2003 or Windows 2000 can be operated on NEC Express5800 Server,
  you can use the other procedure described later.

  Follow the steps below.

1. Prepare one 3.5-inch floppy disk.

2. Turn on your NEC Express5800 Server.

3. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.

4. Press the RESET switch or press **Ctrl** + **Alt** + **Delete** to reboot the server. (You may also
    turn off and then on again to reboot the server.)

    The system will boot from the CD-ROM and NEC EXPRESSBUILDER starts.

5. Select [Create Support Disk] from [Tools].

6. Select [Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER] from [Create
    Support Disk] menu.

7. Insert a floppy disk into the floppy disk drive according to the instruction on the screen.

Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER will be created.

Write-protect and attach a label, then keep it safely.

■ Create from [Master Control Menu]

[Master Control Menu] runs on the following operating systems.

– Windows Server 2003 x64 Editions

– Windows Server 2003

– Windows 2000

– Windows Me/98/95

– Windows NT 4.0

– Windows XP x64 Edition

– Windows XP

You can create Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER from [Master Control Menu], if you have the computer on which the above operating systems operate.

Follow the steps below.

8. Prepare one 3.5-inch floppy disk.

9. Run the operating system.

10. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.

[Master Control Menu] will appear.

11. Click on [Setup] with left mouse button and click [Make OEM-DISK] and then [for Windows Server 2003].

> **NOTE:** You can do the same operation with the menu appeared by the Right-click.

12. Insert the floppy disk into the floppy disk drive according to the message.

Windows Server 2003 OEM-DISK for NEC 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.

1.   Turn on the system power.

2.   Insert the Windows Server 2003 CD-ROM into the CD-ROM drive.

3.   Press **Ctrl** + **Alt** + **Delete** to reset the system.

After a bootable operating system has been installed on the hard disk, 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, 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 (including embedded HostRAID feature) or SCSI controller is installed in the system, press **F6** in a few seconds when the window is in either of the following states.

–   "Setup is inspecting your computer's hardware configuration ..." is displayed.

–   A screen with a solid blue background is displayed.

> **IMPORTANT:** There is no visible indication on screen when **F6** has been pressed.

5.   When the following message is displayed, press **S**.

```
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.
```

The following message is displayed.

```
                    Please insert the disk labeled
          manufacturer-supplied hardware support disk
                            into Drive A:
                    *Press ENTER when ready.
```

6.   Insert the Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER into the floppy disk drive, and press **Enter**.

A list of mass storage devices is displayed.

7. Select the proper SCSI Adapter and press **Enter**.

– MegaRAID SCSI 320-1 RAID Controller
(When N8103-80F board is installed.)

– Adaptec Ultra320 SCSI Cards
(WinXP/Server 2003 IA-32) (When N8103-75F board is installed.)

– INITIO INI-A10XU2W SCSI Host Adapter
(When N8103-65F board is installed.)

– Promise FastTrak S150 SX4(tm) Controller-Intel x86 platform
(When N8103-78F board is installed.)

– Promise FastTrak S150 SX4100(tm) Controller-Intel x86 platform
(When N8103-89 board is installed.)

– Adaptec Embedded Serial ATA HostRAID Driver for Windows 2000/XP/2003
(When HostRAID is installed.)

Continue performing tasks according to the subsequent messages that appear.

After installation is completed, be sure to execute the tasks described in "Driver Installation and Advanced Settings" and "Updating the System" of this manual.

Upgrade Installation

Procedures below upgrade the installed Windows 2000 to Windows Server 2003.

1. Power on the system and start Windows 2000.

2. Log on as an administrator.

3. Insert the Windows Server 2003 CD-ROM into the CD-ROM drive.

Then, [Select an operation] dialog will appear.

> **NOTE:** If the [Select an operation] dialog box does not appear, start \SETUP.EXE from CD-ROM drive.

4. Select [Install Windows Server 2003].

Then, a dialog box asks to select the upgrade or clear installation.

5. Select "Upgrade (recommended)" and click the Next.

Follow the messages and continue.   The system will automatically restart after copying the files.

> **NOTE:** You can leave the Windows Server 2003 CD-ROM in CD-ROM drive.

6. If the RAID controller (including embedded HostRAID feature) is installed in the system, press **F6** while a message, "Setup is inspecting your computer's hardware configuration...", is on the screen.

> **IMPORTANT:** There is no visible indication on screen when F6 has been pressed.

7. When the following message is displayed, press **S**.

```
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.
```

The following message is displayed.

```
Please insert the disk labeled
manufacturer-supplied hardware support disk
into Drive A:
*Press ENTER when ready.
```

8. Insert the Windows Server 2003 OEM-DISK for EXPRESSBUILDER into the floppy disk drive, and press **Enter**. A list of SCSI adapters will be displayed.

9. If the optional board is installed, select the proper SCSI Adapter and press **Enter**.

   – Adaptec Ultra320 SCSI Cards (WinXP/Server 2003 IA-32) (When N8103-75F board is installed.)

   – LSI MEGARAID Products for Windows 2003 (x86) (When N8103-80F board is installed.)

   Continue performing tasks according to the subsequent messages that appear.

10. Update the system.

11. Install the driver and make detailed settings.

    ■ If PROSet is already installed, uninstall the PROSet before upgrading.

      If the teaming function is enabled, disable the function before uninstalling PROSet.

    ■ During upgrade installation, [Disk Insert] dialog box may appear.

      If it appears, click Cancel.

    ■ When upgrade installation is completed, [Device Driver Wizard] dialog box may appear.

      If it appears, click Cancel, then update the system.

Reinstallation to Multiple Logical drives

This subsection describes the procedure for reinstalling the operation system if the 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:

> 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 earlier in this chapter.

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 modify with the following procedure.

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 Path...].

4. Click [Yes].

5. Choose the [Assign a 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 may cause programs to no
   > longer run. Are you sure you want to change this drive letter?

8. Close the [Computer Management].

Updating the System

To ensure normal system operation you should update your system using the following procedures.

1. Logon to the system using the administrator account or other account which is a member of the Administrators group.

2. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.

    Master Control Menu is automatically appeared on the screen.

3. Click on [Setup] with left mouse button and click on [Update NEC Express5800 system] section.

4. Continue your work for system update as the following message.

5. Click on [Restart Computer] to restart the system.

6. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive immediately after clicking on [Restart Computer]

    > **IMPORTANT:** If you change the configuration of the system (by adding or removing hardware or Operating system software components) or repair the system, you must run the system update again.

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.

PROSet

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 CD-ROM into the CD-ROM drive.

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 "PROSET.EXE" in the following directory.

   CD-ROM DriveLetter:\WINNT\DOTNET\BC3\PROSET\WS03XP32

   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. Choose "Typical" and click [Next].

7. Click [Install].

8. When [InstallShield Wizard Completed] window is displayed, click [Finish].

9. Restart the system.

Network Driver

Specify the details of network driver.

One standard network driver that is mounted will be installed automatically, but the link speed and Duplex mode need to be specified manually.

[When PROSet is not installed]

1. The [Local Area Connection Properties] dialog box appears.

    * The procedure in the case of the standard start menu

    1. Click Start menu, Click [Control Panel], Click [Network Connections], and Click [Local Area Connection].

    * The procedure in the case of the classic start menu

    1. Click Start menu, Click [Settings] and Click [Network Connections].

        The [Network Connections] dialog box appears.

    2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.

2. Click [Configure].

    The property dialog box for network adapter appears.

3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

4. Click [OK] on the property dialog box for network adapter.

[When PROSet is installed]

1. The [Intel(R) PROSet Wired] dialog box appears.

    * The procedure in the case of the standard start menu

      Click Start menu, point to [Control Panel] and click [Intel(R) PROSet Wired].

    * The procedure in the case of the classic start menu

    1. Click Start menu, point to [Settings] and click [Control Panel].

    2. Double-click [Intel(R) PROSet Wired] on the [Control Panel] window.

2. Click [(Network Adapter Name)] in the list.

3. Click the [Speed] and specify the [Link Speed & Duplex Settings] value the same as the value specified for HUB.

4. Click [Apply] and click [OK].

Also, add or delete any protocols and services if necessary.

You can operate the process on the property dialog box for local area network which can be appeared from [Network and Dial-up Connection].

> **NOTE:** We recommend you to add [Network Monitor] at
> [AddingServices]. [Network Monitor] can monitor the frame (or the
> packet) that the computer installing [Network Monitor] sends or
> receives. This tool is valuable when analyzing network trouble. For
> information on how to install the tool, see the "Setup for Trouble
> Process" later in this document.

Re-install the Network Driver

The network driver will be installed automatically.

Installing SCSI Controller Driver (N8103-65F/75)

If you utilize SCSI controller driver (N8103-65F/75), install it according to the following procedure:

1. Start [Device Manager] from [Start] menu → [Control Panel]→ [Administrative Tools]
   →[Computer Management].

2. Double-click the SCSI Controller driver which Device Manager lists as unknown device.

3. Click [Update Driver].

4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific
   location [Advanced]" and click [Next].

5. Select "Don't search. I will choose the driver to install" and click [Next].

6. Click [Have Disk..].

7. Insert "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" into the floppy
   disk drive, enter "a:\" into "copy manufacturer's file from:" and click [OK].

8. Specify the following driver and click [Next].

   – [INITIO INI-A10XU2W PCI SCSI Controller]
     (When N8103-65F board is installed.)

   – [Adaptec SCSI Card 29320ALP -Ultra320 SCSI]
     (When N8103-75 board is installed.)

The installation of the driver is completed.

Restart the system according to the message appeared on the screen.

Installing SCSI Controller Driver (N8103-56F/95)

If you utilize SCSI controller driver (N8103-56F/95), update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

The SCSI controller driver will be installed automatically.

Installing RAID Controller Driver (N8103-80F)

To additionally install the N8103-80F in a system containing Windows 2003, connect the controller and take the following steps to install the driver:

1. When the [Found New Hardware Wizard] dialog box appears, click [Next].

2. When the [Install Hardware Device Drivers] dialog box appears, select [Search for a suitable driver for my device (Recommended)], and click [Next].

3. When the [Locate Driver Files] dialog box appears, select [Floppy disk drives], insert "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, and click [Next].

4. When the [Driver Files Search Results] dialog box appears, click [Next].

5. Copying of the driver is completed, and the [Completion of the new hardware detection wizard] dialog box below appears. Click [Complete].

Available Switch Options for Windows Server 2003 Boot.ini File

Many different switches will be available if you edit Boot.ini file.

For the available switch options, refer to the following information:

- Microsoft Knowledge Base - Article ID: 833721

  "Available switch options for the Windows XP and the Windows Server 2003 Boot.ini files"

If your system has a memory capacity in excess of 4GB in its installing, adding /PAE switch in Boot.ini file will enable the system to be installed with over 4GB of memory.

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 - Aritcle ID: 291988

  "A description of the 4GB RAM tuning feature and the Physical Address Extension switch"

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].

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, Standard" /fastdetect
multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003, Standard, 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 COLLECTING MEMORY DUMP (DEBUG INFORMATION)

Set for collecting memory dump using the procedure described in Chapter 5.

Appendix F

Installing Windows 2000

This section describes the procedures for installing Windows 2000 without using Express Setup tool.

BEFORE INSTALLING WINDOWS 2000

Please read carefully the following information BEFORE commencing your Windows 2000 Installation.

Optional Board Supported by NEC EXPRESSBUILDER

The NEC EXPRESSBUILDER CD-ROM attached to your system supports the following optional boards;

- Supporting installation of OS in NEC EXPRESSBUILDER
  - N8103-65F SCSI Controller
  - N8103-75F SCSI Controller
  - N8103-95 SCSI Controller
  - N8103-78F Disk Array Controller (SATA)
  - N8103-80F Disk Array Controller (SCSI 1ch)
  - N8103-89 Disk Array Controller (SATA)
  - SATA HostRAID (Onboard Adaptec HostRAID controller)
- Other optional boards
  - N8103-56F SCSI Controller

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.

> **IMPORTANT:** Be sure to confirm the following items before applying Service Pack to your system.
> This system does not support Windows 2000 Service Pack 1 - 3.
> If you install Windows 2000 CD-ROM which contains Service Pack 4 to your system, you do not have to apply Service Pack 4 again.

Updating System

If you change the configuration of the system, update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

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.

Manual Installation when S-ATA HostRAID and N8103-65F/75/78F/80F/89 Keeps Connection

If you keep those controllers connecting during installation process, pop-up messages may appear.

This does not affect on system behavior. Click [YES] and continue the installation. Follow the message hereafter.

MO Device

If you specify the file system as NTFS with MO Device connected during the installation, the file system will not be converted normally.   Disconnect MO Device and restart the installation from the beginning.

Media such as DAT

During the OS installation, do not attach the unnecessary media for OS installation to the system, such as DAT.

Partition Size

The minimum required partition size for installation of Windows 2000 is:

1000MB + Paging file size + Dump file size

Paging file size (recommended) = Mounted memory size * 1.5

Dump file size   = Mounted memory size + 12 MB

IMPORTANT:

- The above paging file size is necessary for collecting debug information (memory dump).   If you set the default value of paging file size smaller than the 'recommended' value, the accurate debug information (memory dump) may not be collected.
- 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 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 installed memory size is 512MB, the minimum required partition size is

1000MB + (512MB*1.5) + (512MB+12) = 2292MB.

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 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 2000

Preparations for Installation

- NEC EXPRESSBUILDER CD-ROM
- Microsoft Windows 2000 Server (CD-ROM)
- Windows 2000 Service Pack (CD-ROM)
- User's Guide
- Getting Started
- Windows 2000 OEM-DISK for NEC EXPRESSBUILDER

Creating "Windows 2000 OEM-DISK for NEC EXPRESSBUILDER"

Before installing, create Windows 2000 OEM-DISK for NEC EXPRESSBUILDER.

> **NOTE:** If you have already "Windows 2000 OEM-DISK for NEC
> EXPRESSBUILDER" for NEC Express5800 Server which you are
> going to install Windows 2000, you do not need to create it again.

You can create Windows 2000 OEM-DISK for NEC 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 2000 OEM-DISK for NEC
  EXPRESSBUILDER, use this procedure.

  If Windows Server 2003 or Windows 2000 can be operated on NEC Express5800 Server,
  you can use the other procedure described later.

  Follow the steps below.

1. Prepare one 3.5-inch floppy disk.

2. Turn on your NEC Express5800 Server.

3. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM 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 CD-ROM and NEC EXPRESSBUILDER starts.

5. Select [Create Support Disk] from [Tools].

6. Select [Windows 2000 OEM-DISK for NEC EXPRESSBUILDER] from [Create Support
   Disk] menu.

7. Insert a floppy disk into the floppy disk drive according to the instruction on the screen.

Windows 2000 OEM-DISK for NEC EXPRESSBUILDER will be created.

Write-protect and attach a label, then keep it safely.

■ Create from [Master Control Menu]

[Master Control Menu] runs on the following operating systems.

– Windows Server 2003 x64 Editions

– Windows Server 2003

– Windows 2000

– Windows Me/98/95

– Windows NT 4.0

– Windows XP x64 Edition

– Windows XP

You can create Windows 2000 OEM-DISK for NEC EXPRESSBUILDER from [Master Control Menu], if you have the computer on which the above operating systems operate.

Follow the steps below.

1. Prepare one 3.5-inch floppy disk.

2. Run the operating system.

3. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive of the server.

[Master Control Menu] will appear.

4. Click on [Setup] with left mouse button and click [Make OEM-DISK] and then [for Windows 2000].

> **NOTE:** You can do the same operation with the menu appeared by the Right-click.

5. Insert the floppy disk into the floppy disk drive according to the message.

Windows 2000 OEM-DISK for NEC EXPRESSBUILDER will be created.

Write-protect and attach a label, then keep it safely.

Windows 2000 Clean Installation

This section explains how to perform a clean installation of Windows 2000.

1. Turn on the system power.

2. Insert the Windows 2000 CD-ROM into the CD-ROM drive.

3. Press **Ctrl** + **Alt** + **Delete** to reset the system.

After a bootable operating system has been installed on the hard disk, 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, this step is unnecessary.

The Windows 2000 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 (including embedded HostRAID feature) or SCSI controller is installed in the system, press **F6** in a few seconds when the window is in either of the following states.

– "Setup is inspecting your computer's hardware configuration ..." is displayed.

– A screen with a solid blue background is displayed.

> **IMPORTANT:** There is no visible indication on screen when **F6** has been pressed.

5. When the following message is displayed, press **S**.

```
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.
```

The following message is displayed.

```
                    Please insert the disk labeled
           manufacturer-supplied hardware support disk
                            into Drive A:
                    *Press ENTER when ready.
```

6. Insert the Windows 2000 OEM-DISK for NEC EXPRESSBUILDER into the floppy disk drive, and press **Enter**.

A list of mass storage devices is displayed.

7.   Select the proper SCSI Adapter and press **Enter**.

– MegaRAID SCSI 320-1 Controller Driver
(When N8103-80F board is installed.)

– INITIO INI-A10XU2W SCSI Host Adapter
(When N8103-65F board is installed.)

– Adaptec Ultra320 SCSI Cards (Win2000)
(When N8103-75F board is installed.)

– Windows Promise FastTrak S150 SX4 Controller
(When N8103-78F board is installed.)

– Promise FastTrak S150 SX4100(tm) Controller-Intel x86 platform
(When N8103-89 board is installed.)

– Adaptec Embedded Serial ATA HostRAID Driver for Windows 2000/XP/2003
(When HostRAID is installed.)

Continue performing tasks according to the subsequent messages that appear.

After installation is completed, be sure to execute the tasks described in "Driver Installation and Advanced Settings" and "Updating the System" of this manual.

Reinstallation to Multiple Logical Drives

This subsection describes the procedure for reinstalling the operation system if the 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:

> 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 earlier in this chapter.

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 modify with the following procedure.

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 Path...].

4. Click [Yes].

5. Choose the [Assign a 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 may cause programs to no
   > longer run. Are you sure you want to change this drive letter?

8. Close the [Computer Management].

Updating the System - Installing Service Pack -

To ensure normal system operation you should update your system using the following procedures.

> **IMPORTANT:** Be sure to confirm the following items before
> applying Service Pack to your system.
> This system does not support Windows 2000 Service Pack 1 - 3.
> If you install Windows 2000 CD-ROM which contains Service Pack 4
> to your system, you do not have to apply Service Pack 4 again.

1. Logon to the system using the administrator account or other account which is a member of the Administrators group.

2. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.

   Master Control Menu is automatically appeared on the screen.

3. Click on [Setup] with left mouse button and click on [Update NEC Express5800 system] section.

4. Continue your work for system update as the following message.

5. Click on [Restart Computer] to restart the system.

6. Remove the NEC EXPRESSBUILDER CD-ROM from the CD-ROM drive immediately after clicking on [Restart Computer]

> **IMPORTANT:** If you change the configuration of the system (by
> adding or removing hardware or Operating system software
> components) or repair the system, you must run the system update
> again.

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.

PROSet

PROSet is a utility that confirms the function of network contained in network driver. Be sure to install. Utilizing PROSet enables the following issues:

- Confirm detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Specify teaming.

Configuring several network adapters as one team provides the server an environment tolerant on any trouble and enhances through put between the switches.

PROSet is necessary to utilize these features.

Follow the procedure below to install PROSet.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.

2. Click Start menu, point to [Program], [Accessory] and click [Explorer].

3. Run "PROSET.EXE" in the following directory.

   <CD-ROM DriveLetter>:\WINNT\W2K\BC3\PROSET\WIN2K\

   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. Choose "Typical" and click [Next].

7. Click [Install].

8. When [InstallShield Wizard Completed] window is displayed, click [Finish].

9. Restart the system.

Network Driver

[When PROSet is not installed]

1. Click Start menu and click [Network and Dial-Up Connection].

The [Network and Dial-Up Connection] dialog box appears.

2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.

The [Local Area Connection Properties] dialog box appears.

3. Click [Configure].

The property dialog box for network adapter appears.

4. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

5. Click [OK] on the property dialog box for network adapter.

6. Click [OK] on the [Local Area Connection Properties] dialog box.

Also, add or delete any protocols and services if necessary. You can operate the process from [Network and Dial-up Connection] to display the property dialog box for local area network.

> **NOTE:** We recommend you to add [Network Monitor] at [AddingServices]. [Network Monitor] can monitor the frame (or the packet) that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setup for Trouble Process" later in this document.

[When PROSet is installed]

1. Double-click [Intel(R) PROSet Wired] on the [Control Panel] window.

The [Intel(R) PROSet for Wired Connections] dialog box appears. Double-click the [Intel(R) PROSet Wired] icon.

2. Put the cursor to the network driver in the list.

3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

Also specify the other network driver with the same progress above.

Re-install the Network Driver

After installing OS and deleting the network drivers, if you want to re-install the network drivers, follow the procedure below.

1.   Restart OS and logon to your system.

2.   [Upgrade Device Driver Wizard] dialog box appears.

Click [Next].

3.   Confirm that the [Search for a suitable driver for my device (recommended)] radio button is selected and click [Next].

4.   Select the [Specify a location] check box and deselect other check boxes.

Click [Next].

5.   Other [Upgrade Device Driver Wizard] dialog box opens.

When using [Intel(R) PRO/1000MT Network Connection], specify [<CD-ROM Drive Letter>:\WINNT\W2K\BC3\PRO1000\WIN2K].

Then click [OK].

6.   Click [Next].

7.   Click [Finished].

After re-installing the network drivers, the link speed and Duplex mode need to be specified.

Refer to "Network Driver" described earlier.

Graphics Accelerator Driver

Install the display driver using the following procedure.

1.   Insert the NEC EXPRESSBUILDER CD-ROM into the CD-ROM drive.

2.   Run the "CD-ROM Drive Letter:\WINNT\W2K\VIDEO\SETUP.EXE".

Follow the message on the screen.

When the message "Digital Signature Not Found" message appears, click on [Yes].

3.   Remove the NEC EXPRESSBUILDER CD-ROM and restart the system following a message on the screen.

USB 2.0 Driver

USB 2.0 Driver is pre-installed. When restoring the system or re-installing the system, the driver is automatically installed in the process of updating the system.

Installing SCSI Controller Driver (N8103-65F/75)

If you utilize SCSI controller driver (N8103-65F/75), install it according to the following procedure:

1. Start [Device Manager] from [Start] menu → [Control Panel]→ [Administrative Tools] →[Computer Management].

2. Double-click the SCSI Controller driver which Device Manager lists as unknown device.

3. Click [Update Driver].

4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].

5. Select "Don't search. I will choose the driver to install" and click [Next].

6. Click [Have Disk..].

7. Insert "Windows 2000 OEM-DISK for EXPRESSBUILDER" into the floppy disk drive, enter "a:\" into "copy manufacturer's file from:" and click [OK].

8. Specify the following driver and click [Next].

– [INITIO INI-A10XU2W PCI SCSI Controller]
   (When N8103-65F board is installed.)

– [Adaptec Ultra320 SCSI Cards (Win2000]
   (When N8103-75 board is installed.)

The installation of the driver is completed.

Restart the system according to the message appeared on the screen.

Installing SCSI Controller Driver (N8103-56F/95)

If you utilize SCSI controller driver (N8103-56F/95), update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

The SCSI controller driver will be installed automatically.

Installing RAID Controller Driver (N8103-80F)

To additionally install the N8103-80F in a system containing Windows 2000, connect the controller and take the following steps to install the driver:

1. When the [Found New Hardware Wizard] dialog box appears, click [Next].

2. When the [Install Hardware Device Drivers] dialog box appears, select [Search for a suitable driver for my device (Recommended)], and click [Next].

3. When the [Locate Driver Files] dialog box appears, select [Floppy disk drives], insert "Windows 2000 OEM-DISK for EXPRESSBUILDER" into the floppy disk drive, and click [Next].

4. When the [Driver Files Search Results] dialog box appears, click [Next].

5. Copying of the driver is completed, and the [Completion of the new hardware detection wizard] dialog box below appears. Click [Complete].

Available Switch Options for Windows 2000 Boot.ini File

Many different switches will be available if you edit Boot.ini File.

For the available switch options, refer to the following information:

- Microsoft Knowledge Base - Article ID: 170756

   "Available Switch Options for the Windows NT Boot.ini File"

If your system has a memory capacity in excess of 4GB in its installing, adding /PAE switch in Boot.ini file will enable the system to be installed with over 4GB of memory.

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 - Aritcle ID: 291988

   "A description of the 4GB RAM tuning feature and the Physical Address Extension switch"

Below is the example on how to add /PAE switch to Boot.ini file.

1. Click [Start], point to [Programs], point to [Accessories], and then click [Notepad].

2. On the [File] menu, click [Open...].

3. In the [Open] dialog box, in the [Look in] drop-down list box, click "%systemroot%" drive.

4. In the [Open] dialog box, in the [Files of type] drop-down list box, click "All Files" and in the [File name] drop-down list box, enter "Boot.ini". And then, click [Open].

   The content of Boot.ini file will be displayed.

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(1)\WINNT
   [operating systems]
   multi(0)disk(0)rdisk(0)partition(1)\WINNT="Windows 2000 Server" /fastdetect
   multi(0)disk(0)rdisk(0)partition(1)\WINNT="Windows 2000 Server, PAE" /fastdetect /PAE
   ```

   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 COLLECTING MEMORY DUMP (DEBUG INFORMATION)

Set for collecting memory dump using the procedure described in Chapter 5.

(This page is intentionally left blank.)

Appendix G

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						
#1A	Size		Serial No.		Date Installed	
#1B	Size		Serial No.		Date Installed	
#2A	Size		Serial No.		Date Installed	
#2B	Size		Serial No.		Date Installed	
Monitor						
	Type		Model name		Serial No.	
					Date Installed	
Hard Disk (Standard Interface (SATA))						
Channel 1	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Channel 2	Type			Serial No.		
	Capacity			Date Installed		
	Type number					

Hard Disk (optional SCSI controller installed)						
ID0	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
ID1	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
ID2	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
ID3	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
ID4	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
ID5	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
5.25-inch Device						
Slot 1	Size		Capacity		Serial No.	
	Model name		Type number		Date Installed	
Slot 2	Size		Capacity		Serial No.	
	Model name		Type number		Date Installed	
Slot 3 (standard ATAPI CD-ROM drive)	Size		Capacity		Serial No.	
	Model name		Type number		Date Installed	
Slot 4	Size		Capacity		Serial No.	
	Model name		Type number		Date Installed	
PCI-X Slot #1						
	Model name				Serial No.	
					Date Installed	
PCI-X Slot #2						
	Model name				Serial No.	
					Date Installed	
PCI Slot #3						
	Model name				Serial No.	
					Date Installed	
PCIe Slot #4						
	Model name				Serial No.	
					Date Installed	
PCI Slot #5						
	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	
Remarks	