



**N8100-1682F/1685F/1627F/1689F
NEC Express5800/E120b-1
User's Guide**

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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

	
 	<p>Plug in to a proper power source. Use a grounded wall outlet of specified voltage. Use of an improper power source may cause a fire or a power leak.</p>

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 fumes or fire.
	Indicates that improper use may cause fingers to be caught.
	Indicates that improper use may cause personal injury.
	Indicates that improper use may cause personal injury.
	Indicates that improper use may cause explosion.
	Indicates a general notice or warning that cannot be specifically identified.

Prohibited Actions

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

Mandatory Action

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

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

CE Statement

Warning: This is a Class A product. In 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：

此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻擾動，在此種情況下，使用者會被要求採取某些適當的對策。

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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.

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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.

NOTE: This guide contains procedures to use a floppy disk, however, your server is not equipped with factory-installed floppy disk drive. Use an optional USB floppy disk drive.

ABOUT THIS USER'S GUIDE

This User's Guide is a guide for proper setup and use of the server.

This User's Guide also covers useful procedures for dealing with difficulties and problems that may arise during setup or operation of the server. Keep this manual for future use. The following describes how to proceed with this User's Guide.

How to Use This User's Guide

To aid you in finding information quickly, this User's Guide contains the following information:

Chapter 1 Notes on Using Your Server

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

Chapter 2 General Description

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

Chapter 3 Setting Up Your Server

tells you how to select a site, unpack the system, make cable connections, and power on your system.

Chapter 4 Configuring Your Server

tells you how to configure the system and provides instructions for running the BIOS SETUP Utility and the RAID configuration utility, which is used to configure RAID drives in your system.

This chapter also provides information on mother board jumper settings.

Chapter 5 Installing the Operating System with Express Setup

describes how to install the operating system.

Chapter 6 Installing and Using Utilities

describes how to install the utilities for the server. It also includes a description on using the attached "NEC EXPRESSBUILDER" DVD.

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.

Appendix A Specification

provides specifications for your server.

Appendix B Other Precautions

provides supplementary notes on using the server.

Appendix C IRQ

provides a list of factory-set IRQs.

Appendix D Installing Windows Server 2008 R2

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

Appendix E Installing Windows Server 2008

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

Appendix F Installing Windows Server 2003 x64 Editions

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

Appendix G Installing Windows Server 2003

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

Appendix H Using a Client Computer Which Has a CD Drive

describes how to install the management software of EXPRESSBUILDER to the client computer without the DVD drive.

Appendix I Accessing Power and Performance Data

describes how to collect the power and performance data, including power consumption, inlet air temperature, and processor utilization of NEC Express server.

Appendix J Product Configuration Record Table

provides a table to be filled with your server configuration.

Text Conventions

The following conventions are used throughout this User's Guide. For safety symbols, see "SAFETY INDICATIONS" provided earlier.

IMPORTANT:	Items that are mandatory or require attention when using the server.
NOTE:	Notes give important information about the material being described.

IN THE PACKAGE

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

- Store the provided accessories in a designated place for your convenience. You will need them to install an optional device or troubleshoot your server, as well as to set it up.
- Make a backup copy of each provided floppy disk, if any. Store the original disk as the master disk in a designated place, and use its copy.
- Improper use of any provided floppy disk, DVD-ROM, or CD-ROM may alter your system environment. If you find anything unclear, immediately ask your service representative for help.

CONTENTS

Preface	i
About This User's Guide	ii
In the Package	iii
Chapter 1 Notes on Using Your Server	1-1
Warning Labels	1-2
Safety Notes	1-4
General	1-4
Rack	1-6
Power Supply and Power Cord Use	1-7
Installation, Relocation, Storage, and Connection	1-9
Cleaning and Working with Internal Devices	1-11
During Operation	1-12
For Proper Operation	1-13
Transfer to Third Party	1-15
Disposal and Consumables	1-16
Regarding the Transportation of this System	1-16
User Support	1-16
Chapter 2 General Description	2-1
Overview	2-2
System Chassis	2-3
Front View	2-3
Rear View	2-6
Internal View	2-8
Mother Board	2-11
Backplane Board	2-12
Standard Features	2-13
Remote Power-On Feature (Wake On LAN)	2-14
AC LINK Feature	2-14
Security	2-14
NEC EXPRESSBUILDER	2-15
NEC ESMPRO	2-15
Maintenance Tools	2-16
System Diagnostic Utility	2-16
Remote Management	2-16
Using Your Server	2-17
POWER Switch	2-17
Identification of Servers ~ UID Switch ~	2-25
Flash FDD	2-26
Chapter 3 Setting Up Your Server	3-1
Setup Flow	3-2
Unpacking the System	3-3
Installing Optional Devices	3-3
Selecting Server Site	3-4
Installing the Server	3-6

Connecting Peripheral Devices.....	3-15
Connecting Power Cord.....	3-19
Turning On the Server	3-21
Installing Operating System	3-23
Installing Utilities	3-23
Rack Mount Instructions.....	3-23
Making Backup Copies of System Information.....	3-24

Chapter 4 Configuring Your Server..... 4-1

System BIOS (SETUP).....	4-1
Starting SETUP Utility.....	4-2
Description on On-Screen Items and Key Usage	4-3
Configuration Examples.....	4-4
Menu and Parameter Descriptions	4-8
RAID System Configuration	4-28
RAID.....	4-28
Configuration by Onboard RAID Controller.....	4-33
LSI Software RAID Configuration Utility and Universal RAID Utility.....	4-48
Configuring Mother Board Jumpers.....	4-51

Chapter 5 Installing the Operating System with Express Setup..... 5-1

About Express Setup	5-2
Windows Server 2008 R2	5-3
Notes on Windows Installation.....	5-3
Flow of Setup	5-8
Installing the Windows Server 2008 R2.....	5-9
Installing and Setting Device Drivers.....	5-22
Setting for Solving Problems	5-28
BitLocker.....	5-28
Windows Server 2008.....	5-29
Notes on Windows Installation.....	5-29
Flow of Setup	5-35
Installing the Windows Server 2008.....	5-36
Installing and Setting Device Drivers.....	5-50
The procedure to set PAE option.....	5-57
Setting for Solving Problems	5-57
Windows Server 2003.....	5-58
Notes on Windows Installation.....	5-58
Flow of Setup.....	5-63
Installing Windows Server 2003.....	5-64
Installing and Setting Device Drivers.....	5-74
LAN Driver and PROSet.....	5-74
LAN Driver Setting.....	5-75
Setup Team.....	5-78
LAN Board Driver (N8104-122/125A/126).....	5-80
LAN Board Driver (N8104-123A).....	5-81
Graphics Accelerator Driver.....	5-81
Installing SCSI Controller Driver (N8103-107).....	5-81
Installing SAS Controller Driver (N8103-104A).....	5-81
Installing RAID Controller Driver (N8103-135).....	5-81

The procedure to set PAE option.....	5-82
Setting for Solving Problems	5-83
Setting for Solving Problems.....	5-84
Memory Dump (Debug Information).....	5-84
How to Create a User-mode Process Dump File.....	5-91
Network Monitor.....	5-94
Re-installing the Operation System if Multiple Logical Drives Exist.....	5-96
Installing Maintenance Utilities.....	5-98
Updating the System.....	5-98
Making Backup Copies of System Information.....	5-99
Installing with the OEM-Disk for Mass Storage Device.....	5-100
Chapter 6 Installing and Using Utilities	6-1
NEC EXPRESSBUILDER.....	6-2
Autorun Menu.....	6-7
Parameter File Creator.....	6-8
Parameter File	6-9
NEC ESMPRO	6-22
Functions and Features.....	6-22
NEC ESMPRO Agent Extension.....	6-23
NEC ExpressUpdate Agent.....	6-23
Universal RAID Utility.....	6-24
Setup with Express Setup.....	6-24
Manual Setup	6-24
Management of RAID System using NEC ESMPRO Manager.....	6-25
Creating Logical Drive of RAID 6.....	6-25
NEC Product Info Collection Utility	6-26
Installation.....	6-26
Using Utility.....	6-27
Uninstallation	6-27
Chapter 7 Maintenance.....	7-1
Making Backup Copies.....	7-1
Cleaning.....	7-2
Cleaning the Server	7-3
Cleaning the Interior.....	7-4
Cleaning the Keyboard/Mouse.....	7-5
Cleaning Disc.....	7-6
System Diagnostics.....	7-7
Test Items.....	7-7
Startup and Exit of System Diagnostics	7-8
Relocating/Storing The Server.....	7-11
Chapter 8 Troubleshooting	8-1
System Viewers	8-2
LED	8-3
POWER LED	8-3
STATUS LED.....	8-3
DISK ACCESS LED.....	8-5
UID LED (Unit Identification).....	8-5

LINK/ACT LED	8-5
SPEED LED	8-5
Hard Disk Drive LED	8-6
Error Messages	8-7
Error Messages after Power-on	8-7
POST Error Messages	8-8
Messages displayed by RAID Controller during POST	8-12
Beep Codes	8-16
Error Messages on Virtual LCD	8-17
Solving Problems	8-19
Problems with the Server	8-19
Problems with Windows	8-25
Problems with RAID System and RAID Controller	8-35
Problems with N8190-127/131/153/154 Fibre Channel Controller	8-36
Problems with NEC EXPRESSBUILDER	8-37
Problems with Autorun Menu	8-39
Collecting Dr. Watson Diagnostic Information	8-40
Memory Dump	8-40
Preparing for Memory Dumping	8-40
Saving the Dump File	8-41
Recovery for Windows System	8-42
Maintenance Tools	8-43
Starting Maintenance Tools	8-43
Function of Maintenance Tools	8-46
Maintenance Tools with Remote Console	8-47
Resetting the Server	8-50
Forced Shutdown	8-50
Chapter 9 Upgrading Your Server	9-1
Safety Notes	9-2
Static Precautions	9-3
Preparing for Installation and Removal	9-4
Device Installation or Removal Procedure	9-6
Hard Disk Drive	9-6
DIMM	9-12
Processor (CPU)	9-17
PCI Board	9-23
Appendix A Specifications	A-1
Appendix B Other Precautions	B-1
Transfer Rate of the On-board LAN Controller	B-1
Server Management Software	B-1
Floppy Disk	B-1
CD/DVD Discs	B-4
Tape Media	B-4
Keyboard	B-5
Mouse	B-6
Appendix C IRQ	C-1

Appendix D	Installing Windows Server 2008 R2	D-1
Notice		D-1
Optional Board Supported by NEC EXPRESSBUILDER		D-1
Service Pack Which NEC EXPRESSBUILDER Supports		D-1
Installing Service Pack		D-2
Connecting Hard Disk Drive		D-2
Updating System		D-2
Installing on the Mirrored Volume		D-2
About Removable Media		D-2
Floppy Disk Drive		D-2
About the System Partition Size		D-3
BitLocker		D-5
Installing Windows Server 2008 R2		D-6
Preparations for Installation		D-6
Windows Server 2008 R2 Clean Installation		D-6
Procedure for License Authentication		D-16
Updating the System		D-16
Driver Installation and Advanced Settings		D-19
LAN Driver and PROSet		D-19
Graphics Accelerator Driver		D-19
Installing SCSI Controller Driver (N8103-107)		D-20
Installing SAS Controller Driver (N8103-104A)		D-20
Installing RAID Controller Driver (N8103-135)		D-20
Installing the Fibre Channel Controller Driver (N8190-127/131/153/154)		D-20
About Windows Activation		D-21
Setting for Solving Problems		D-25
Appendix E	Installing Windows Server 2008	E-1
Notice		E-1
Optional Board Supported by NEC EXPRESSBUILDER		E-1
Service Pack Which NEC EXPRESSBUILDER Supports		E-1
Installing Service Pack		E-2
Connecting Hard Disk Drive		E-2
Updating System		E-2
Installing on the Mirrored Volume		E-2
About Removable Media		E-2
Floppy Disk Drive		E-2
About the System Partition Size		E-3
BitLocker		E-6
Installing Windows Server 2008		E-7
Preparations for Installation		E-7
Windows Server 2008 Clean Installation		E-7
Procedure for License Authentication		E-18
Updating the System		E-18
Driver Installation and Advanced Settings		E-21
LAN Driver and PROSet		E-21
Graphics Accelerator Driver		E-21
Installing SCSI Controller Driver (N8103-107)		E-22
Installing SAS Controller Driver (N8103-104A)		E-22
Installing RAID Controller Driver (N8103-135)		E-22

Installing the Fibre Channel Controller Driver (N8190-127/131/153/154).....	E-22
About Windows Activation	E-23
The procedure to set PAE option.....	E-28
Setting for Solving Problems.....	E-28
Appendix F Installing Windows Server 2003 x64 Editions	F-1
Notice	F-1
Optional Board Supported by NEC EXPRESSBUILDER.....	F-1
Service Pack Which NEC EXPRESSBUILDER Supports	F-2
Installing Service Pack.....	F-2
Connecting Hard Disk Drive.....	F-2
Updating System	F-2
Re-installing to the Hard Disk Drive which has been upgraded to Dynamic Disk	F-2
About Removable Media	F-2
Floppy Disk Drive.....	F-2
About the System Partition Size.....	F-3
Installing Windows Server 2003 x64 Editions.....	F-4
Creating "Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER"	F-4
Windows Server 2003 x64 Editions Clean Installation	F-7
Procedure for License Authentication	F-11
Updating the System - Applying Service Pack -	F-12
Driver Installation and Advanced Settings	F-19
LAN Driver and PROSet.....	F-19
LAN Driver Setting.....	F-21
Setup Team.....	F-24
LAN Board Driver (N8104-122/125A/126).....	F-26
LAN Board Driver (N8104-123A).....	F-26
Graphics Accelerator Driver.....	F-27
Installing SCSI Controller Driver (N8103-107).....	F-27
Installing SAS Controller Driver (N8103-104A).....	F-27
Installing RAID Controller Driver (N8103-135).....	F-28
About Windows Activation	F-29
Setting for Solving Problems.....	F-30
Appendix G Installing Windows Server 2003.....	G-1
BEFORE INSTALLING WINDOWS SERVER 2003	G-1
Optional Board Supported by NEC EXPRESSBUILDER.....	G-1
Service Pack Which NEC EXPRESSBUILDER Supports	G-2
Application of Service Pack	G-2
Connecting Hard Disk Drive.....	G-2
Updating System	G-2
Re-installing to the Hard Disk which has been upgraded to Dynamic Disk	G-2
About Removable Media	G-2
Floppy Disk Drive.....	G-2
About the System Partition Size.....	G-3
Installing Windows Server 2003.....	G-4
Creating "Windows Server 2003 OEM-Disk for EXPRESSBUILDER"	G-4
Windows Server 2003 Clean Installation	G-7
Procedure for License Authentication	G-11
Updating the System - Applying Service Pack -	G-11

Driver Installation and Advanced Settings	G-17
LAN Driver and PROSet.....	G-17
Graphics Accelerator Driver.....	G-17
Installing SCSI Controller Driver (N8103-107).....	G-17
Installing SAS Controller Driver (N8103-104A).....	G-17
Installing RAID Controller Driver (N8103-135).....	G-18
About Windows Activation	G-19
The procedure to set PAE option.....	G-21
Setting for Solving Problems.....	G-22
Appendix H Using a Client Computer Which Has a CD Drive	H-1
Appendix I Accessing Power and Performance Data	I-1
Power Consumption	I-1
Inlet Air Temperature.....	I-3
Processor Utilization.....	I-8
Appendix J Product Configuration Record Table	J-1
Hardware	J-1
Software	J-5

Chapter 1

Notes on Using Your Server

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

WARNING LABELS

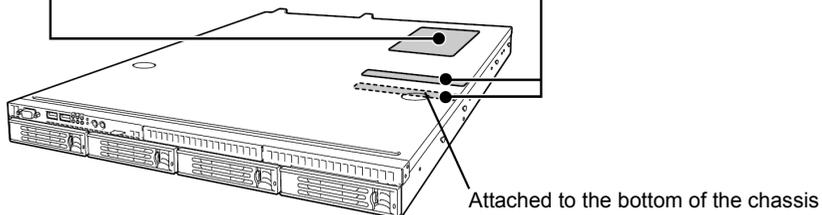
The warning label is attached to components with possible danger or their vicinity in your server to inform the user that a hazardous situation may arise when operating the server. (Do not intentionally remove or damage any of the labels.)

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

3.5-inch Hard Disk Drive Model

注意 CAUTION	
<p>装置になるコンポーネントが熱くなります。十分に涼ませてから操作するようにして下さい。</p> <p>As some components may become very hot during system operation, give ample time to allow cooling as well as use precaution when handling internal components immediately after powering down.</p> <p>有的组件可能会变得很热。请注意待其冷却之后再再接触。</p> <p>有的组件可能会变得很热。请注意待其冷却之后再再接触。</p>	⚠
<p>電源を切ってもバッテリーで稼働している部分があります。</p> <p>Some internal components may still be operational on battery power. Refer to instruction manuals for this system as well as options prior to maintenance.</p> <p>即使切断电源，有的部件也会依靠电池运转。</p> <p>在进行维护之前，请认真阅读各组件的使用说明书。</p> <p>即使切断电源，有的部件也会依靠电池运转。</p> <p>在进行维护之前，请认真阅读各组件的使用说明书。</p>	⚠
<p>オプションの取り付け、取外し時は電源プラグをコンセントから抜き、外装接続と接続しているケーブルを外して下さい。</p> <p>Disconnect all AC power cords from both system and external peripherals prior to installing/removing options.</p> <p>进行可选配件的安装和拆卸时，请先从插座取下电源插头并分离与外部设备间的线缆。</p>	⚠
<p>ネジは本体内部へ落とさない様、十分注意下さい。</p> <p>Do not drop any screws inside the system.</p> <p>请一定注意不要让螺丝掉入设备的内部。</p> <p>请注意拆卸时不要将螺丝掉入设备的内部。</p>	⚠
<p>ケーブル及びオプション機器の接続の際は必ずユーザーガイドを参照し、正しく接続して下さい。</p> <p>Refer to "User's Guide" when option board or peripherals are installed. Incorrect installations may result in damage to the system and lead to accidents.</p> <p>连接板卡及可选设备时，请务必参照“用户指南”进行正确连接。</p> <p>连接错误，有可能造成故障或火灾。</p> <p>安装控制卡及可选设备时，请务必参照“用户指南”进行正确连接。</p> <p>连接错误，有可能造成故障或火灾。</p>	⚠
<p>怪我を防止し、落下防止のために十分注意して下さい。</p> <p>To avoid the risk of personal injury, be careful when accessing the inside of the system.</p> <p>请小心不要夹住或碰伤手指。</p> <p>请注意不要夹伤手指，或因碰撞而受损。</p>	⚠
<p>装置の持ち上げ、移動の際は、装置の底面をしっかり持って持ち上げて下さい。</p> <p>Firmly hold the bottom of the system when required to lift and carry the system.</p> <p>抬起、移动设备时，请牢固抓住设备底部将其抬起。</p> <p>抬起、搬運回服务器时，请牢牢抓住设备底部将其抬起。</p>	⚠

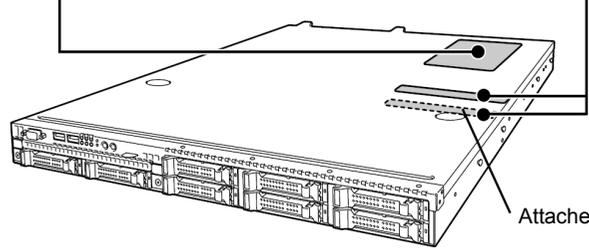
注意 CAUTION	落下注意	➡
<p>これ以上引くと落下します。</p> <p>Firmly hold the bottom of the system when removing from the rack cabinet.</p>		



2.5-inch Hard Disk Drive Model

⚠ 注意 CAUTION	
<p>高温になるコンポーネントがあります。十分に冷えてから触れるようにして下さい。</p> <p>As some components may become very hot during system operation, give ample time to allow cooling as well as use precaution when handling internal components immediately after powering down.</p> <p>有的部件可能会达到高温，请注意待其冷却之后再接触。</p> <p>有的组件可能会达到高温，请注意须等冷却之后再接触。</p>	⚠
<p>電源を切ってもバッテリーで稼働している部分があります。保守をする前に必ずこのコンポーネントの取り扱いに関する指示を熟読してください。</p> <p>Some internal components may still be operational on battery power. Refer to instruction manuals for this system as well as options prior to maintenance.</p> <p>即使切断电源，有的部件也会依靠电池运转。</p> <p>在进行维护之前，请认真阅读各组件的使用说明书。</p> <p>即使切断电源，有的组件也会在电池运转。</p> <p>在进行维护之前，请事先阅读各组件的使用说明书。</p>	⚠
<p>オプションの取付け、取外し時は電源プラグをコンセントから抜き、外部電源と接続しているケーブルを外して下さい。</p> <p>Disconnect all AC power cords from both system and external peripherals prior to installing/removing options.</p> <p>进行可选配件的安装和拆卸时，请先从插座拔下电源插头并分离与外部设备间的连接。</p> <p>进行可选配件安装和拆卸时，请先把电源插头从插座中拔出，并取下所有外部设备间的连接。</p>	⚠
<p>ネジは本格的な道具でないと落とさないでください。</p> <p>Do not drop any screws inside the system.</p> <p>请不要用非专业工具拆卸螺丝。</p> <p>请注意绝对不要将螺丝掉入机箱内部。</p>	⚠
<p>ボード及びオプション機器の接続の際は、必ずユーザーガイドを参照し、正しく接続して下さい。</p> <p>誤った接続は、故障や火災の原因となります。</p> <p>Refer to "User's Guide" when option board or peripherals are installed. Incorrect installations may result in damage to the system and lead to accidents.</p> <p>连接板卡及可选设备时，请务必参照“用户指南”进行正确连接。</p> <p>连接错误，有可能造成故障或火灾。</p> <p>安装控制卡及選購設備時，請務必參照“用戶指南”進行正確連接。</p> <p>連接錯誤時，可能會造成故障或火災。</p>	⚠
<p>部品はさんだり、ぶついたりしないように注意して下さい。</p> <p>To avoid the risk of personal injury, be careful when accessing the inside of the system.</p> <p>请小心不要夹住或碰伤手指。</p> <p>请注意不要夹伤手指，或因碰撞而受伤。</p>	⚠
<p>装置の持ち上げ、移動の際は、装置の底面をしっかり握って持ち上げて下さい。</p> <p>Firmly hold the bottom of the system when required to lift and carry the system.</p> <p>抬起、移动设备时，请牢固抓住设备底部将其抬起。</p> <p>抬起、搬運伺服器時，請牢牢抓住設備底部將其抬起。</p>	⚠

<p>⚠ 注意 CAUTION</p>	<p>落下注意 これ以上引くと落下します。 Firmly hold the bottom of the system when removing from the rack cabinet.</p>	
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Attached to the bottom of the chassis

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. For component names used in this section, see Chapter 2.

General

WARNING



Do not use the server for services where critical high availability may directly affect human lives.

Your server is not intended to be used with or control facilities or devices concerning human lives, including medical devices, nuclear facilities and devices, aeronautics and space devices, transportation facilities and devices; and facilities and devices requiring high reliability. NEC assumes no liability for any accident resulting in personal injury, death, or property damage if the server has been used in the above conditions.



Do not use the server if any smoke, odor, or noise is present.

If smoke, odor, or noise is present, immediately turn off the server and disconnect the power plug from the outlet, then contact your service representative. Using the server in such conditions may cause a fire.



Keep needles or metal objects away from the server.

Do not insert needles or metal objects into ventilation holes in the server or openings in the optical disk drive. Doing so may cause an electric shock.



Always install the server on a rack conforming to the relevant standard.

Install the server on a rack conforming to the EIA standard for the server to be used. Do not use the server with installed on any other rack than standard EIA 19-inch rack or without the installation on a proper rack. Failure to follow these instructions may cause the server to operate incorrectly and/or personal injury or damages of surrounding devices to occur. Contact your service representative for the racks available for the server.



Do not use the server in any unapproved place.

Install the server on a standard EIA 19-inch rack assembly. Do not install the rack containing the server in a place inappropriate to the rack installation environment.

Failure to follow these instructions may cause some bad influences to be imposed on the server and other systems installed on the rack and also a fire or personal injury due to falling of the rack may occur. For the detailed explanation on the place where the server should be installed and the earthquake-resistant construction for the rack, refer to the manual attached to the rack or contact you service representative.

 **CAUTION**



Keep water or foreign matter away from the server.

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

Rack

⚠ CAUTION



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

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



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

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



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

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



Insert hinges completely.

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



Do not pull out a device from the rack if the rack is unstable.

Always pull out a device from the rack after the rack has been made stable (by the installation of stabilizers or earthquake-resistant construction). If a device is pulled out while the rack is unstable, the rack might fall over, causing injury.



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

Pulling out more than one device from the rack may cause the rack to fall over, causing injury. Pull out only one device from the rack at a time.



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

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

Power Supply and Power Cord Use

⚠ WARNING



Do not hold the power plug with a wet hand.

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



Do not connect the ground wire to a gas pipe.

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

⚠ CAUTION



Plug in to a proper power source.

Use a grounded wall outlet of specified voltage. 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.



Do not pull the cable when disconnecting it.

When disconnecting the cable from the device, hold the cable connector and pull it straight out. Pulling the cable out by the cable portion or giving mechanical stress to the connector could damage the cables and connectors to result in an electrical shock hazard or 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.

⚠ CAUTION



Use the authorized power cord only.

Use only the power cord that comes with your server. Use of an unauthorized power cord may cause a fire when the electric current exceeds the rated flow.

Also, observe the following to prevent an electric shock or fire caused by a damaged cord.

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



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



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

Do not install the server in the following places or any place other than specified in this User's Guide. Failure to follow this instruction may cause a fire.

- a dusty place
- a humid place such as near a boiler
- a place exposed to direct sunlight
- an unstable place



Do not use the server in the place where corrosive gases exist.

Make sure not to locate or use the server in the place where corrosive gases (sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, ozone, etc.) exist.

Also, do not set it in the environment where the air (or dust) includes components accelerating corrosion (ex. sulfur, sodium chloride) or conductive metals. There is a risk of a fire due to corrosion and shorts of an internal printed board.



Pay attention not to drop the server.

Firmly hold the bottom of the server when installing it in the rack.

The rack mount bracket has no stopper or lock mechanism to prevent the server from falling down. Failure to follow this instruction may cause personal injury.



Do not leave the device being pulled out from the rack.

Do not work with the server with the device being pulled out from the rack.

The rack mount bracket has no stopper or lock mechanism to prevent the server from falling down. Failure to follow this instruction may cause personal injury.



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

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



Do not pinch your finger with rails or other components.

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

⚠ CAUTION



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

Make sure to power off the server and unplug the power cord from a power outlet before 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 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 service representative. 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 if the server is off-powered.

Disconnect the power plug from the outlet occasionally and clean the plug with a dry cloth. Heat will be generated if condensation is formed on a dusty plug, which may cause a fire.

⚠ CAUTION



Avoid installation in extreme temperature conditions.

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



Make sure to complete installation.

Always install a power cable, interface cable, and/or board firmly. An incompletely installed component 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 installed devices, attach the protective cap to the connector. Failure to follow this warning may cause a fire or an electric shock.

During Operation

WARNING



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 leave the server with its tray of optical disk drive ejected.

Dust may enter the server through openings and cause malfunctions of the server. Any person may also bump it and get injured.



Do not pull out or remove the server from the rack unnecessarily.

Do not pull out or remove the server from the rack unnecessarily. Pulling out or removing the server from the rack may cause not only the server to operate incorrectly but also the server to fall on people to make them injured.



Stay away from the fan.

Keep your hand or hair away from the cooling fan on the rear of the server. Failure to follow this warning may get your hand or hair caught in the fan, resulting in injury.

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.

- Make sure to power off the server before connecting or disconnecting cables between the server and peripheral devices.
- Verify that the access LED on the server is unlit before turning off the server or ejecting the disc.
- When you have just turned off the server, wait at least 10 seconds before turning it back on. If the server is connected to the UPS, set at least 10 seconds delay in the power-on schedule.
- Turn off the power and unplug the power cord from the outlet or EcoPowerGateway before relocating the server.
- Clean the server on a regular basis. (See Chapter 9 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.
- For the disc which does not conform to the standard, the playback of such a disc with the optical disk drive is not guaranteed.
- Check and adjust the system clock before the operation if any of the following conditions is applicable.
 - After carriage of device
 - After storage of device
 - After the device is entered into the pause state under the environmental condition enduring device operation (temperature: 10°C - 35°C, humidity: 20% - 80%)
- Check the system clock at the rough rate of once per month. When the system clock is installed in a system requiring high time precision, it is recommended to use a time server (NTP server).

If the system clock is remarkably delayed or advanced as the passage of time in spite of adjustment, contact your service representative to ask maintenance.
- Store the unit under the storage condition (temperature: -10°C - 55°C, humidity: 20% - 80%, without condensation) to allow internal devices and the unit to operate correctly in the next operation.
- It is recommended that the server, the internal devices, and media (such as tape cartridge) should be stored in a place where the room temperature can be maintained. It is important for the server or internal devices to work normally after storage. Store the device in the place where temperature ranges between -10 to 55°C and humidity ranges between 20 to 80%, without dew condensation.

- 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.
- 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.

TRANSFER TO THIRD PARTY

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

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

IMPORTANT: About data on the hard disk drive

Be sure to take appropriate measures not to leak important data (e.g., customers' information or companies' management information) on the removed hard disk drive to any third parties.

Data seems to be erased when you empty "Recycle Bin" of Windows or execute the "format" command of the operating system. However, the actual data remains written on the hard disk drive. Data not erased completely may be restored by special software and used for unexpected purposes.

It is strongly recommended that the software or service (both available at stores) for data erasure should be used in order to avoid the trouble explained above. For details on data erasure, ask your sales representative.

Provided software

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

- All provided software applications must be transferred and no backup copies must be retained.
- Transfer requirements listed in "Software License Agreement" that comes with each software application must be satisfied.
- Software applications that are not approved for transfer must be uninstalled before transferring the server.

DISPOSAL AND CONSUMABLES

- Dispose of the server, all the internal devices, and CD/DVD-ROMs according to all national laws and regulations. Also dispose of the power cord provided with the server to avoid diversion to some other devices.

IMPORTANT:

- For disposal (or replacement) of the battery on the mother board of the server, consult with your service representative.
 - It is the user's responsibility to completely erase or modify all the data stored in storage device such as hard disk drive 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 and internal batteries. For stable operation of the server, NEC recommends you replace these components on a regular basis. Consult with your service representative for replacement or the product lives.

REGARDING THE TRANSPORTATION OF THIS SYSTEM

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

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

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

USER SUPPORT

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

1. Check if the power cord and the cables to other devices are properly connected.
2. See Chapter 8 to find if your problem fits the description. If it does, take the recommended measure for it.
3. Check if the software required for operation of the server is properly installed.

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

Advice for Health

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

Good Working Posture

You have good posture if the following are satisfied when you use a computer:

- You sit on a chair with your back straight.
- Your hands are parallel with the floor when you put them on the keyboard.
- You look at the screen slightly lower than your eye height.

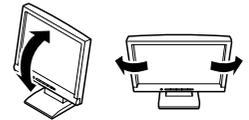
You have "good working posture" as described in the above when no part of your body is under excess strain, in other words when your muscles are most relaxed.

You have "bad posture" when you sit with your back hunched up or you operate a display unit with your face close to the screen. Bad working posture may cause eye strain or poor eyesight.



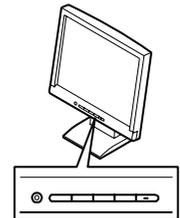
Adjustment of Display Unit Angles

Most display units are designed for adjustment of the horizontal and vertical angles. This adjustment is important to prevent the screen from reflecting bright lights and to make the display contents easy to see. You will not be able to keep "good working posture" and you will feel more tired than you should if you operate a display unit without adjusting horizontal and vertical angles.



Adjustment of Screen Brightness and Contrast

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



Adjustment of Keyboard Angle

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



Cleaning of Equipment

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

Fatigue and Rest

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



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Chapter 2

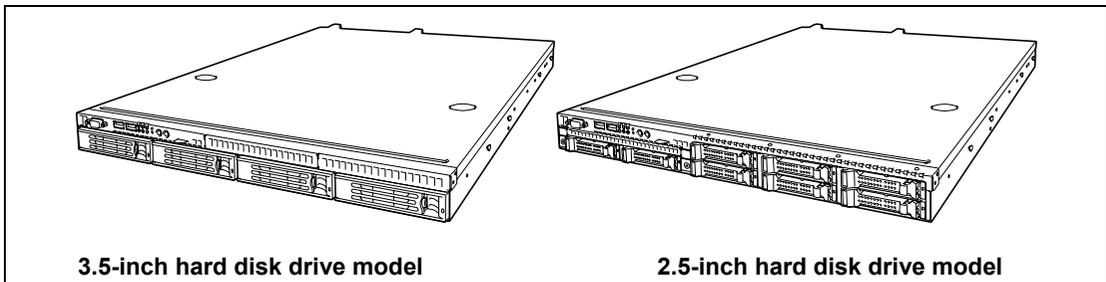
General Description

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 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.

Your server is housed and available as a rack-mount system. Your server conveniently installs into a standard EIA 19-inch rack assembly.



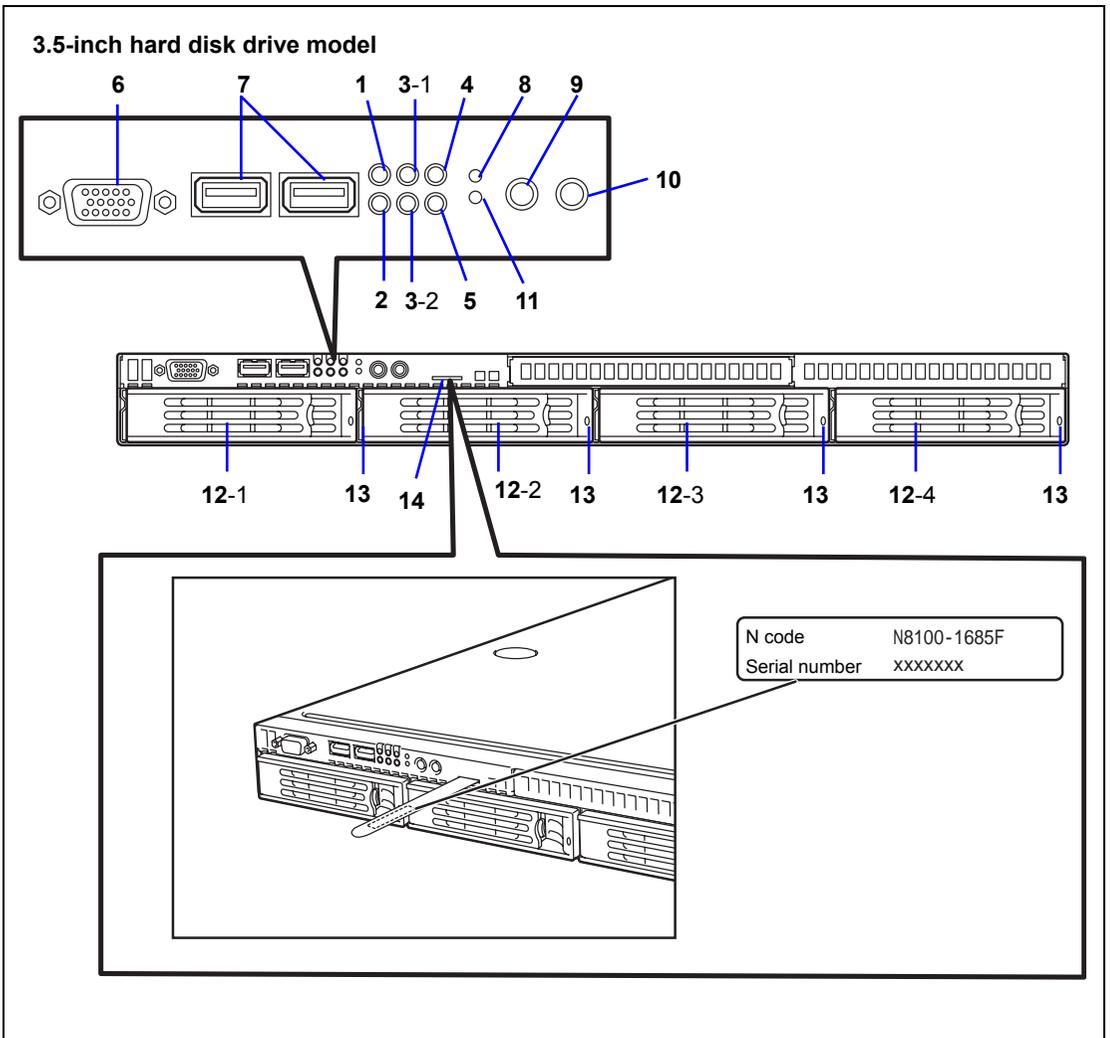
As application requirements increase, you can expand your server with an additional memory, add-in boards and peripheral devices; tape devices, optical disk drive, and hard disk drives. The server features the following major components.

- A high-performance quad-core/hexa-core Intel® Xeon® processor
- Up to 64GB of memory (using 8GB DIMMs)
Minimum configuration is 1GB of memory
- Dual channel memory configuration
- Two PCIe (x8) slots are factory-installed.
- Onboard RAID Controller
- Onboard 1000/100/10 network controller

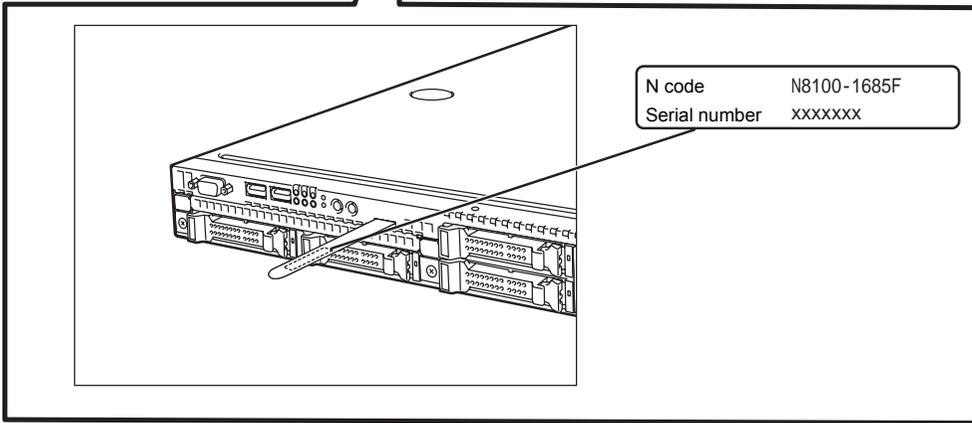
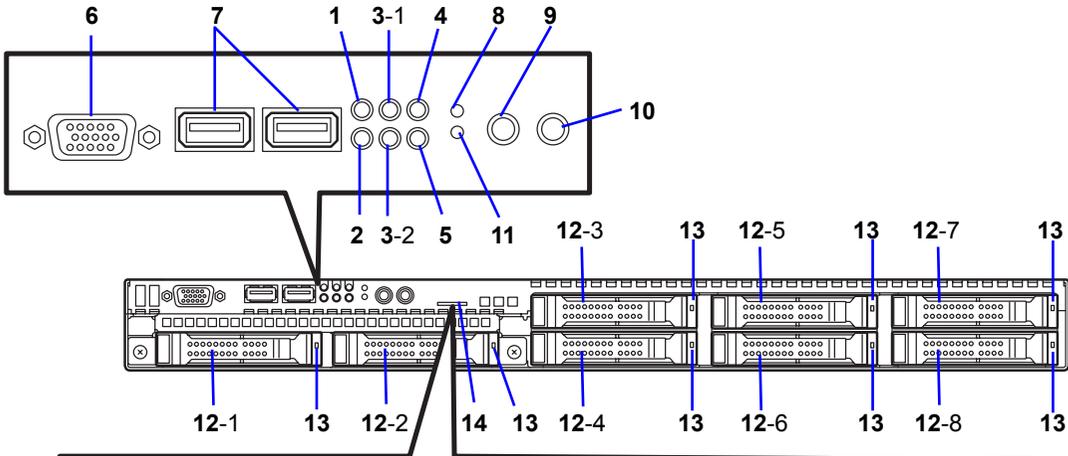
SYSTEM CHASSIS

Names and functions of the components are shown below.

Front View



2.5-inch hard disk drive model



- 1 POWER LED (green)**

This LED turns green when the power is turned on.
- 2 DISK ACCESS LED (green/amber)**

This LED is green during access to the internal hard disk drives or optical disk drive. The LED turns amber when the hard disk drive fails. The LED blinks green and amber alternately during rebuild processing (in RAID configuration).
- 3 ACT/LINK LED (green)**

This LED is on while the system is connected to the network.
- 4 UID (Unit ID) LED (blue)**

This LED goes on when the UID switch is pressed. (The LED also goes on or blinks when software issues a command.)
- 5 STATUS LED (green/amber) (on the front panel)**

This LED indicates the server status. The LED is green during normal operation. The LED turns amber or blinks when the server enters the abnormal state.
- 6 VGA port connector**

This connector is used to connect the server to a device with the VGA port.
- 7 USB connector**

These connectors are used to connect the server to a device with the USB interface.
- 8 Reset switch**

Press this switch to reset the system. In normal operation, this switch is not used.
- 9 UID (Unit ID) switch**

Press the UID switch to turn on/off the UID LED. Pressing the switch once turns on the LED. Pressing it again turns it off.
- 10 POWER switch**

The POWER switch is used to turn the power of the server ON/OFF. If you press this switch once, the power is turned on with the POWER LED going on green. If you press the switch again, the power is turned off with the LED going off. Keep pressing the switch for 4 seconds or more forcibly shuts down the system. This switch can be used as a SLEEP switch if the OS supports sleep feature. In SLEEP Mode, this LED blinks.
- 11 NMI (DUMP) switch**

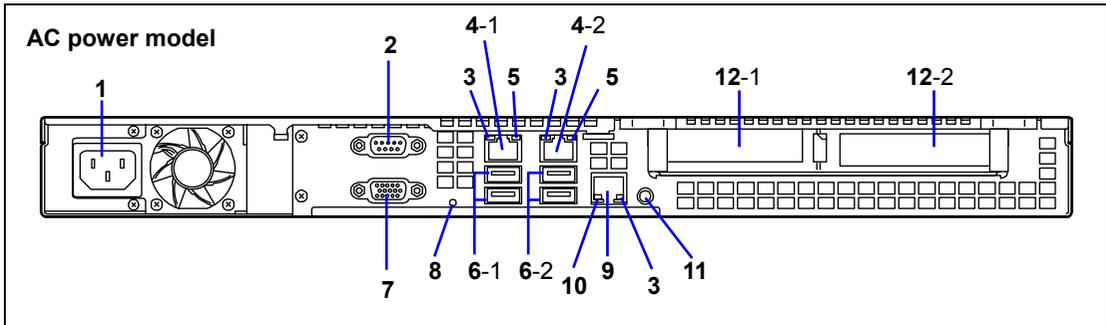
Press this switch to dump system memory. In normal operation, this switch is not used.
- 12 Hard disk drive bays**

Up to four hard disk drives can be installed in the bays on 3.5-inch disk model server.
Up to eight hard disk drives can be installed in the bays on 2.5-inch disk model server.
The last-digit number indicates the channel number. In the standard configuration, the dummy sponge blocks are installed in all the bays.
- 13 DISK LED (green/amber)**

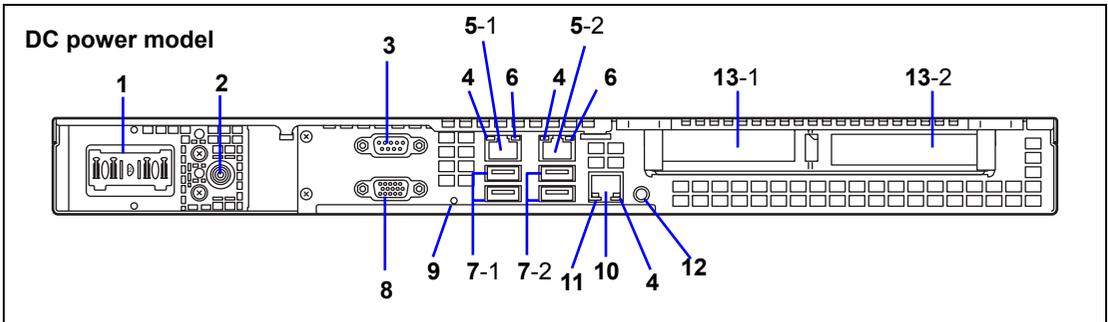
LED on the hard disk drive. Each LED is green during access to the hard disk drive. The LED turns amber when the hard disk drive fails. The LED blinks green and amber alternately during rebuild processing (in RAID configuration).
- 14 Slide-label slot**

A label indicating the N code and serial number of the server slides in here.

Rear View



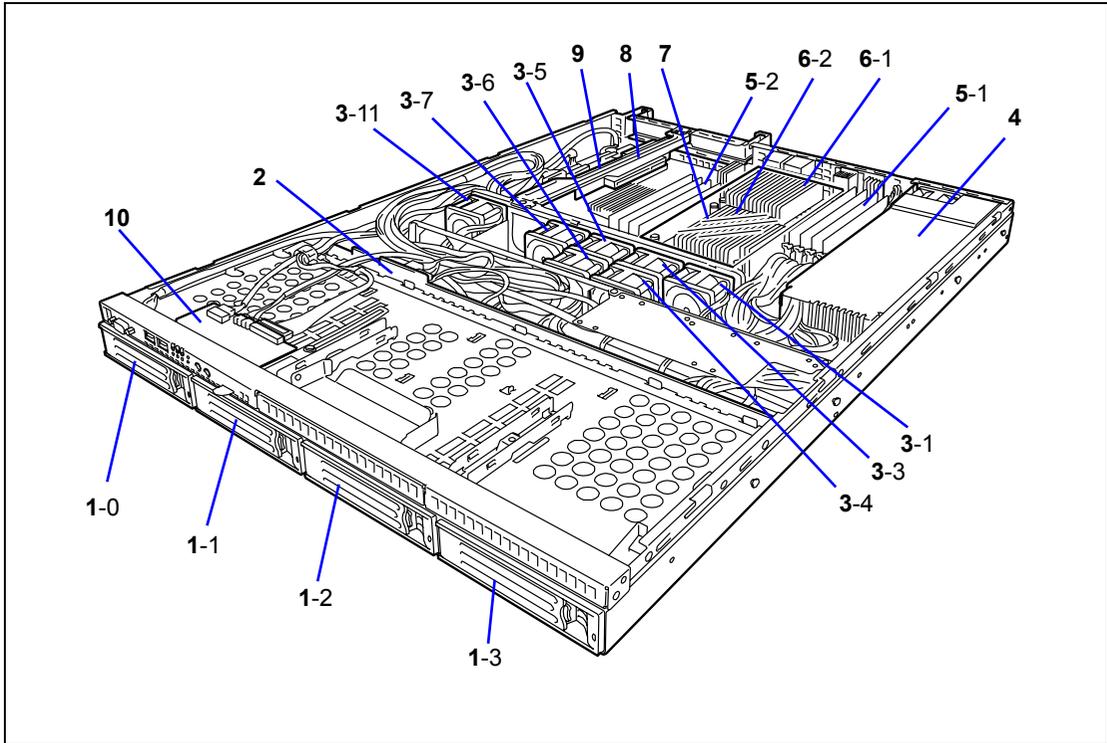
- 1 **AC inlet**
Connect the AC power cord to this socket.
- 2 **Serial port B (COM B) connector**
The connector is used to connect a device with the serial interface.
- 3 **LINK/ACT LED (green)**
The ACT/LINK LED is lit green when the network port is being linked with the connected device such as a hub (LINK state). If a data is transferred through a network port, the LED blinks green (ACT state).
- 4 **LAN connectors**
The connectors are used to connect the network systems on LAN through 1000BASE-T/100BASE-TX/10BASE-T interface.
The last digit number indicates LAN port number.
* The number may differ from that shown on OS.
- 5 **1000/100/10 LED**
This LED indicates the transfer rate of LAN port.
- 6 **USB connectors 1/2**
The connector is used to connect a device compliant with the USB interface. The last digit number "1" indicates connector 1, and the number "2" indicates connector 2.
- 7 **Monitor connector**
The connector is used to connect a display unit.
This connector cannot be used when the VGA connector on the front is used.
- 8 **POWER LED (green)**
This LED turns green when the power is turned on.
- 9 **Management LAN connector**
The connector is used to connect with 100BASE-TX/10BASE-T interface.
Cannot be used for data transmission.
- 10 **100/10 LED**
This LED indicates the transfer rate of management LAN port.
- 11 **UID (Unit ID) switch / UID LED (blue)**
Press the UID switch to turn on/off the UID LEDs. Press this switch using a thin, nonconductive stick.
- 12 **PCI board extension slot**
Install the optional PCI board into these slots.
12-1 Low-profile PCI board
12-2 Low-profile PCI board



- 1 DC inlet**
Connect the DC power cable to this socket.
- 2 DC power LED**
When power is being supplied through the DC cable, the LED is green.
When the DC cable is disconnected, the LED should turn off. Check that this is the case.
You can press this LED, but it just functions as an LED and no other function is assigned.
- 3 Serial port B (COM B) connector**
The connector is used to connect a device with the serial interface.
- 4 LINK/ACT LED (green)**
The ACT/LINK LED is lit green when the network port is being linked with the connected device such as a hub (LINK state). If a data is transferred through a network port, the LED blinks green (ACT state).
- 5 LAN connectors**
The connectors are used to connect the network systems on LAN through 1000BASE-T/100BASE-TX/10BASE-T interface.
The last digit number indicates LAN port number.
* The number may differ from that shown on OS.
- 6 1000/100/10 LED**
This LED indicates the transfer rate of LAN port.
- 7 USB connectors 1/2**
The connector is used to connect a device compliant with the USB interface. The last digit number "1" indicates connector 1, and the number "2" indicates connector 2.
- 8 Monitor connector**
The connector is used to connect a display unit.
This connector cannot be used when the VGA connector on the front is used.
- 9 POWER LED (green)**
This LED turns green when the power is turned on.
- 10 Management LAN connector**
The connector is used to connect with 100BASE-TX/10BASE-T interface.
Cannot be used for data transmission.
- 11 100/10 LED**
This LED indicates the transfer rate of management LAN port.
- 12 UID (Unit ID) switch / UID LED (blue)**
Press the UID switch to turn on/off the UID LEDs. Press this switch using a thin, nonconductive stick.
- 13 PCI board extension slot**
Install the optional PCI board into these slots.
13-1 Low-profile PCI board
13-2 Low-profile PCI board

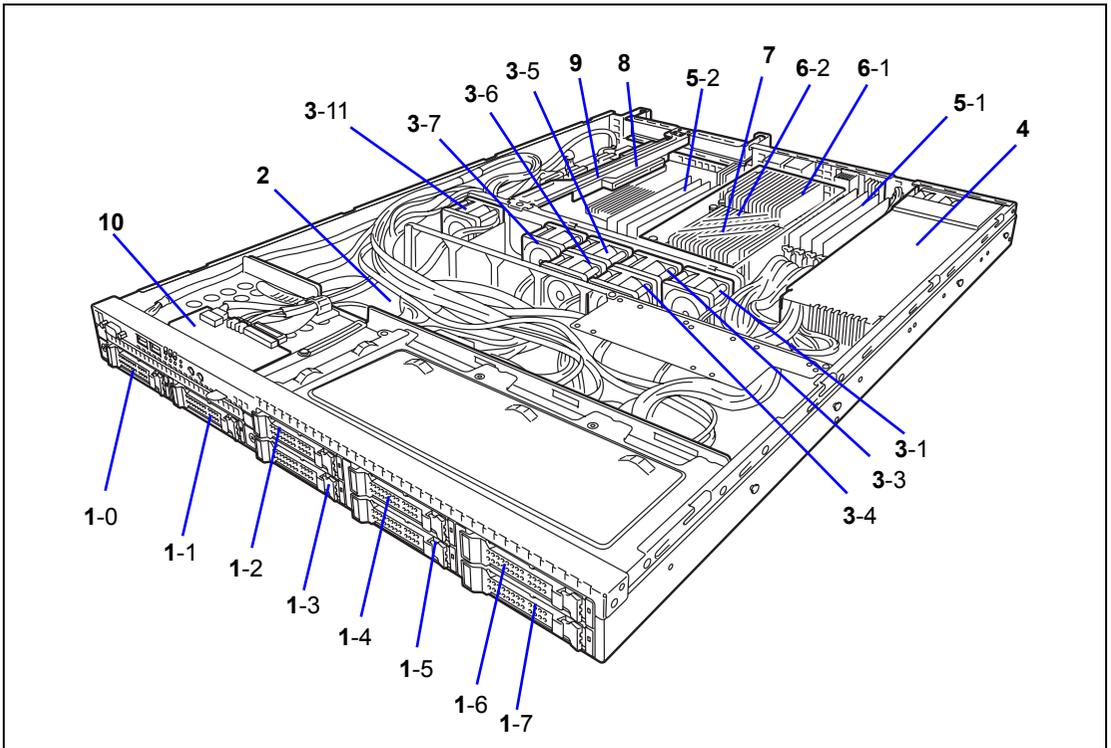
Internal View

3.5-inch Hard Disk Drive (AC-Power) Model



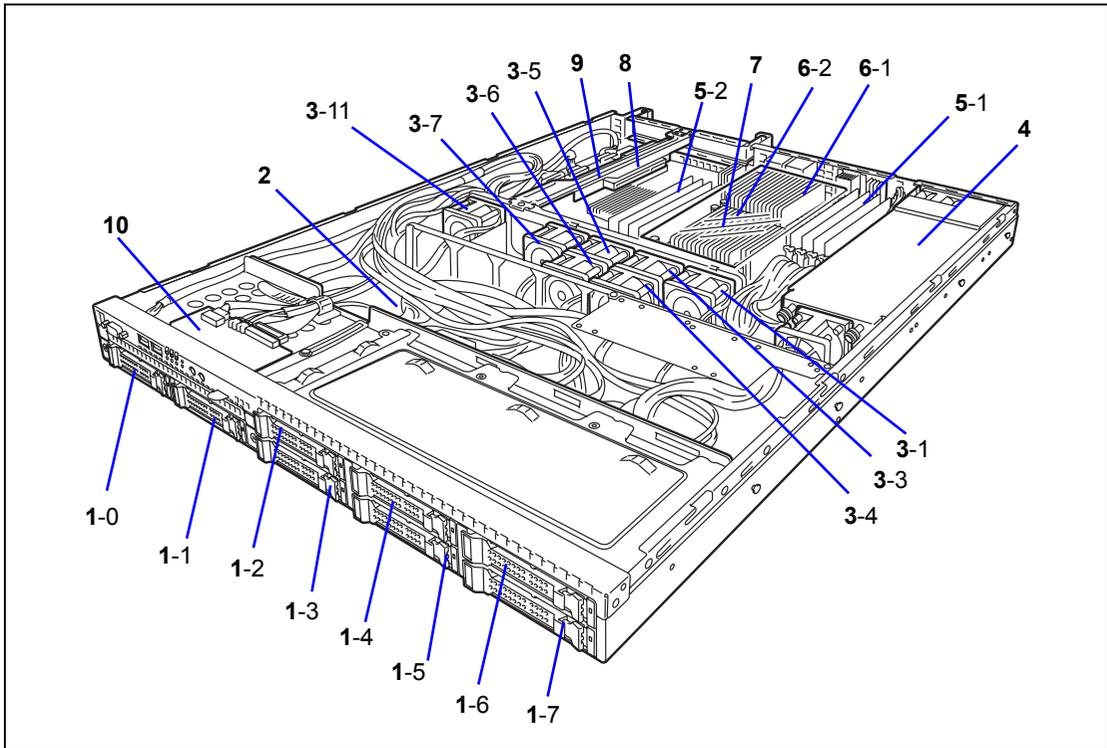
- 1 **Drive bays**
The last digit number indicates the drive bay number. Hard disk drive is optional.
- 2 **Backplane board**
- 3 **Cooling fan** (The last digit number indicates the fan number.)
- 4 **Power supply unit**
- 5 **DIMM**
- 6 **CPU/Heat sink**
- 7 **Air duct**
- 8 **PCI riser card**
- 9 **Mother board**
- 10 **Front panel board**

2.5-inch Hard Disk Drive (AC-Power) Model



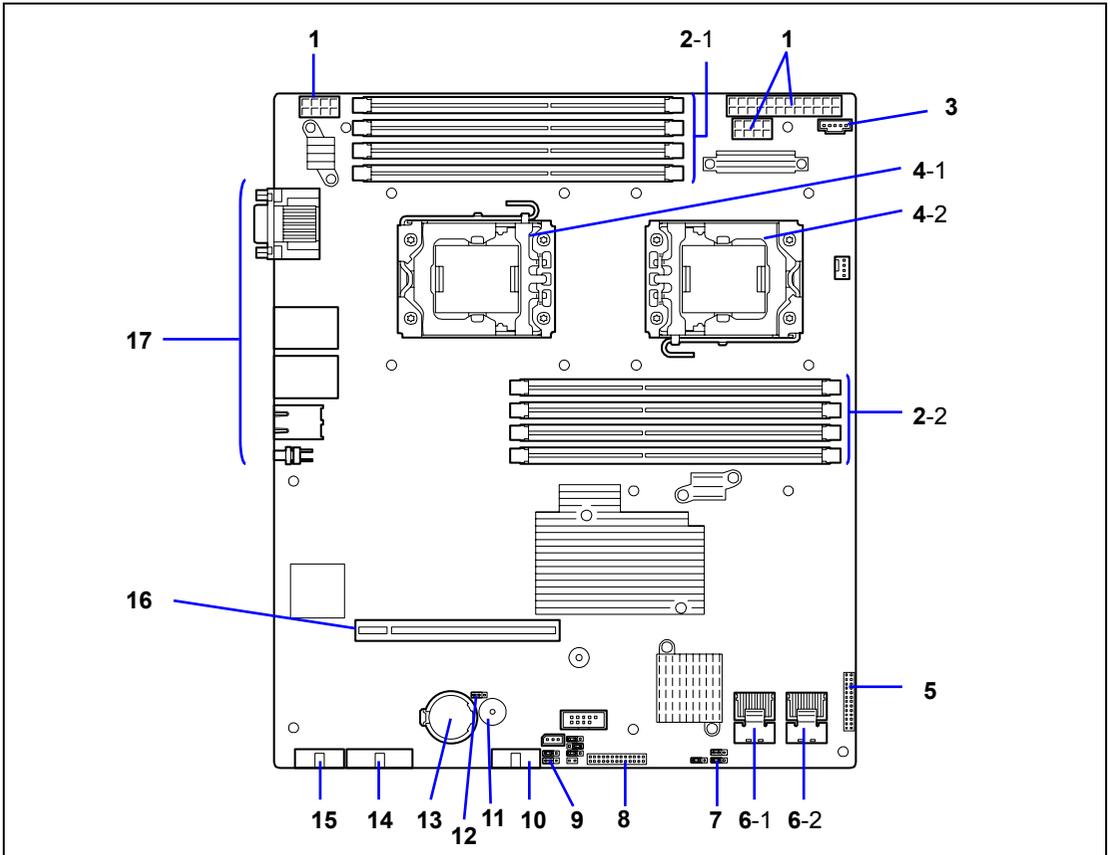
- 1 Drive bays**
The last digit number indicates the drive bay number. Hard disk drive is optional.
- 2 Backplane board**
- 3 Cooling fan** (The last digit number indicates the fan number.)
- 4 Power supply unit**
- 5 DIMM**
- 6 CPU/Heat sink**
- 7 Air duct**
- 8 PCI riser card**
- 9 Mother board**
- 10 Front panel board**

2.5-inch Hard Disk Drive (DC-Power) Model



- 1 Drive bays**
The last digit number indicates the drive bay number. Hard disk drive is optional.
- 2 Backplane board**
- 3 Cooling fan** (The last digit number indicates the fan number.)
- 4 Power supply unit**
- 5 DIMM**
- 6 CPU/Heat sink**
- 7 Air duct**
- 8 PCI riser card**
- 9 Mother board**
- 10 Front panel board**

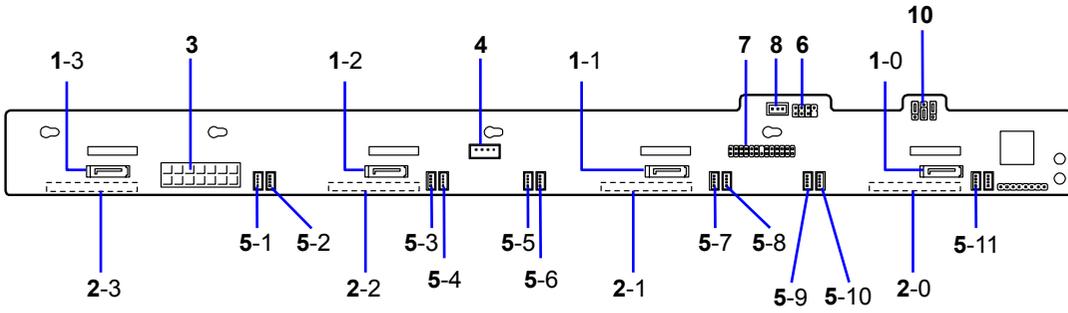
MOTHER BOARD



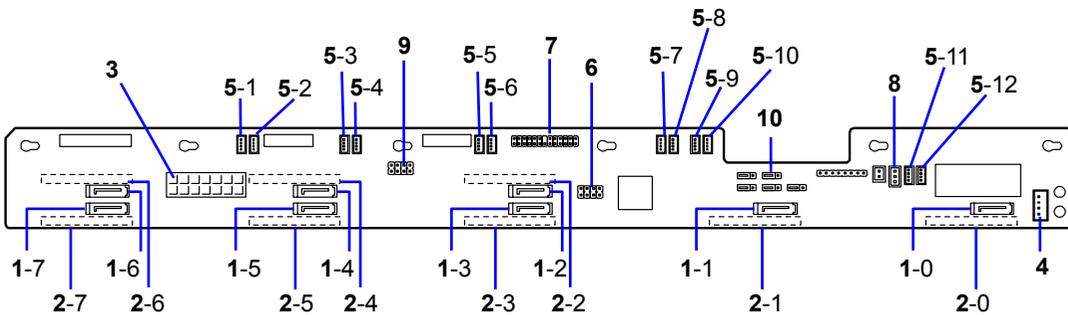
- | | | | |
|----------|------------------------------------|-----------|--|
| 1 | Power connector | 7 | Password clear jumper switch |
| 2 | DIMM socket | 8 | Connector for front panel board |
| | 2-1 CPU1_DIMM1 to CPU1_DIMM4 | 9 | SW RAID jumper switch |
| | 2-2 CPU2_DIMM1 to CPU2_DIMM4 | 10 | Front USB connector |
| 3 | Connector for power monitor | 11 | Speaker |
| 4 | Processor (CPU) socket | 12 | CMOS clear jumper switch |
| | 4-1 CPU1 | 13 | Lithium battery |
| | 4-2 CPU2 | 14 | Front VGA cable connector |
| 5 | Backplane board connector | 15 | Serial port A (COM A) connector |
| 6 | SATA connector | 16 | PCI riser card slot |
| | 6-1 SATA0-3 | 17 | External connector |
| | 6-2 SATA4-5 | | |

BACKPLANE BOARD

3.5-inch hard disk drive model



2.5-inch hard disk drive model

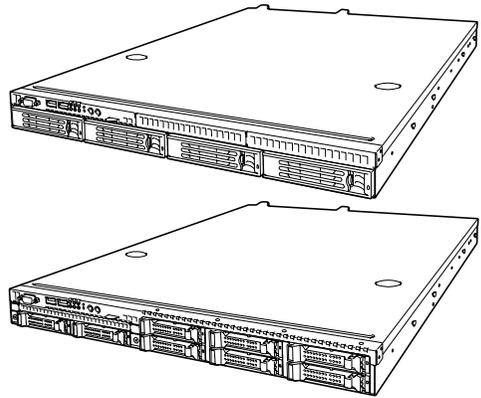


- 1 SATA/SAS connector**
The last digit number indicates connector number.
- 2 Hard disk drive connector (rear face)**
- 3 Power connector**
- 4 Unused**
- 5 System cooling fan connector**
The last digit number indicates fan number. Fan connectors 2, 8, 9, 10, and 12 are not used.
- 6 SGPIO1 connector**
- 7 Connector for mother board**
- 8 Connector for front panel board**
- 9 SGPIO2 connector**
- 10 Hard disk drive jumper switch**

STANDARD FEATURES

High performance

- Intel® Xeon® quad-core/hexa-core processor
 - N8100-1682F/1685F/1627F: 2.13GHz quad-core
 - N8100-1689F: 2.26GHz hexa-core
- High-speed memory access (DDR3 1066/1333)
- High-speed 1000BASE-T/100BASE-TX/10BASE-T interface (2 ports) (1Gbps/100Mbps/10Mbps supported)
- High-speed disk access (SATA and SAS (option))
- Dual channel memory configuration



Expandability

- One PCI Express (x8) slot and one PCI Express (x8) slot (x16 connector)
- Large memory of up to 64GB (eight 8GB DIMMs)
- Two LAN ports for data transmission and one port for management LAN (The management LAN port cannot be used for data transmission.)
- USB interface (USB 2.0)

Many Available Features

- Power switch mask
- Remote power-on feature
- AC-LINK feature
- Hot-swap hard disk drive supported
- IPMI v2.0 compliant Baseboard Management Controller (BMC)

High reliability

- Memory x4/x8 SDDC feature
- Bus parity error detection
- Temperature detection
- Error notification
- Cooling fan monitoring feature
- Voltage monitoring feature
- RAID System (SATA2/SAS)
- BIOS password feature
- Power supply redundancy enabled by connecting to EcoPowerGateway (DC power model only)

Easy and Fine Setup

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

Self-diagnosis

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

Management Utilities

- NEC ESMPRO
- NEC EXPRESSSCOPE Engine 2
- RAID System Management Utility
- NEC ExpressUpdate Utility

Maintenance Features

- Off-line Maintenance Utility
- Memory dump feature using the DUMP switch

Power Saving Feature

- Sleep feature (available for Windows Server 2003) The sleep feature might not work depending on the option cards used.
- Enhanced Intel SpeedStep® Technology
- Enhanced Halt State supported

Space saving

- 1U (approx. 44 mm) height Can be installed in rack.

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 Power Management Setup of the Advanced menu of the BIOS setup utility, "SETUP." (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 Power Management Setup in the Server menu of the BIOS setup utility, "SETUP." (See Chapter 4.)

Security

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

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

NEC EXPRESSBUILDER

The DVD of this server's accessories contains a setup utility called "NEC EXPRESSBUILDER".

The major functions of the NEC EXPRESSBUILDER are:

- To install the Operating System.
"Express Setup" helps you to install the Windows Operating System. (See Appendix E, F, and G.)
 - To diagnose the server.
NEC EXPRESSBUILDER includes System Diagnostics to check this server. (See Chapter 7.)
 - To create a driver disk.
Use this function to create "OEM-disk for Windows" used for a manual installation of Windows. (See Appendix E, F, and G.)
 - To update System BIOS
Use this function to update the server's system BIOS or firmware. (See Chapter 6.)
 - To update Windows system*
"Update the system" in the Autorun menu (See Chapter 6) updates the several drivers of Windows on the server.
 - To install several management utilities*
NEC EXPRESSBUILDER includes the management utilities (NEC ESMPRO, Universal RAID Utility and so on). You can install the applications from NEC EXPRESSBUILDER. (See Chapter 6.)
 - To read several documents*
You can refer to the documents from the Autorun menu. (See Chapter 6.)
- * These functions are available on Windows system.

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

NEC ESMPRO

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

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

Maintenance Tools

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

See Chapter 8 for details.

System Diagnostic Utility

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

Remote Management

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

The EXPRESSSCOPE Engine 2 provides the following features:

- Monitoring of temperature, voltage, fans, and hard disk drives
- Monitoring of power supply unit
- Monitoring of hard disk drives
- Generation of SEL (system event log) at occurrence of hardware failure
- Monitoring of the system management watchdog timer
- Monitoring of the periodic SMI timer
- Remote management by using Web browser and Telnet/SSH client (e.g., resetting the server, power on/off, viewing System Event Log (SEL))
- Remote KVM and remote media features (A separately priced remote management license is required.)
- Remote management via LAN/WAN by using NEC ESMPRO Manager and centralized management of several systems

For more information about remote management using Web browser, Telnet/SSH client, remote KVM feature, and remote media feature, refer to the "EXPRESSSCOPE Engine 2 User's Guide" stored in NEC EXPRESSBUILDER DVD.

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

USING YOUR SERVER

This section describes basic operations of the server including how to use devices such as the optical disk drive. See Appendix B for notes on using the disc and accessories including the keyboard and the mouse.

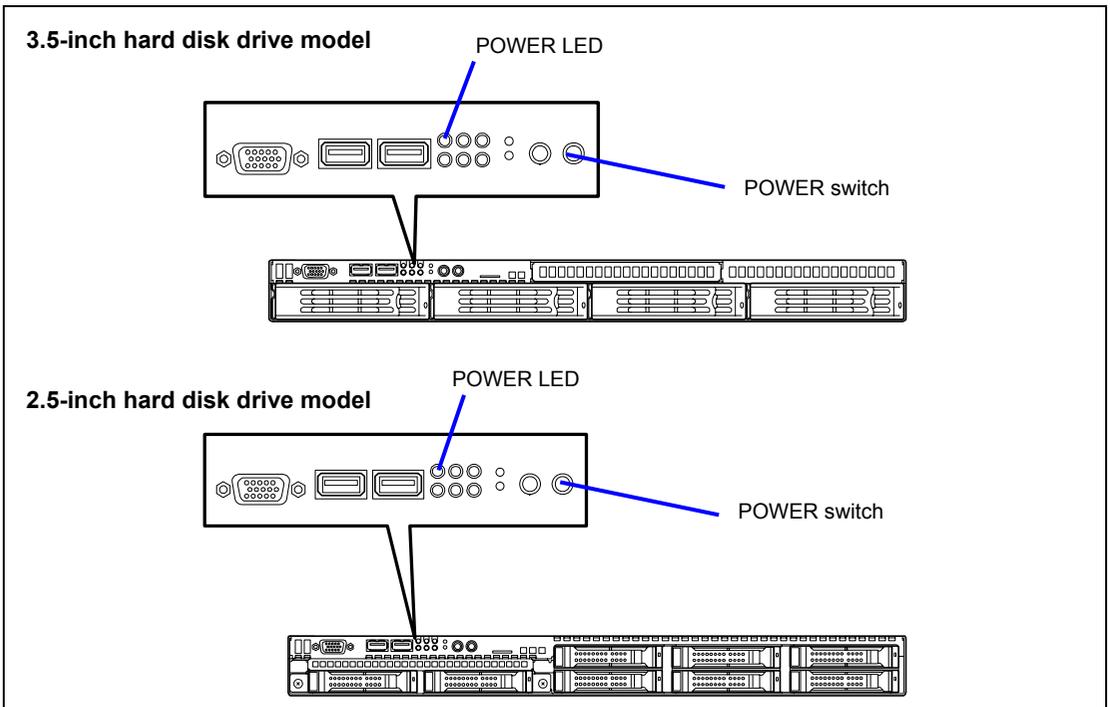
POWER Switch

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

Power On (when using the AC power model)

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

The POWER LED lights in green.



IMPORTANT:

- If the power cord is connected to a power control device such as a UPS (Uninterruptible Power Supply), make sure that the power control device is powered.
- Do not turn off the server until characters appear on the screen.

Power Off (when using the AC power model)

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.

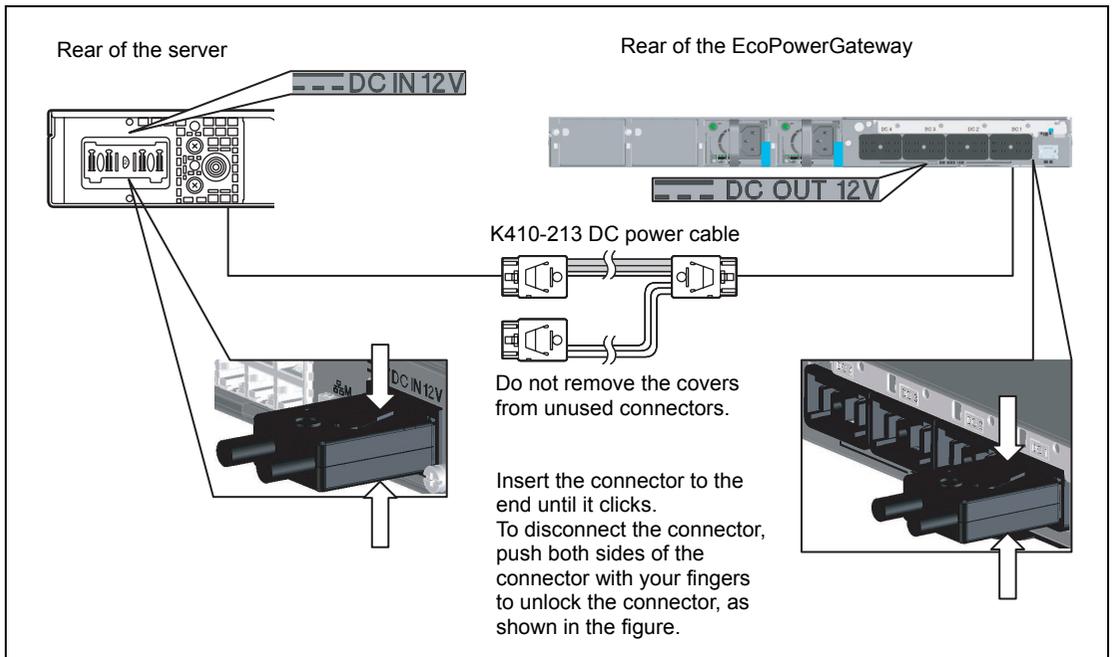
IMPORTANT: Always allow POST to complete before turning off the server.

1. Shut down the OS.
2. Make sure the POWER LED is off.
3. Power off peripheral devices.

Power On (when using the DC power model)

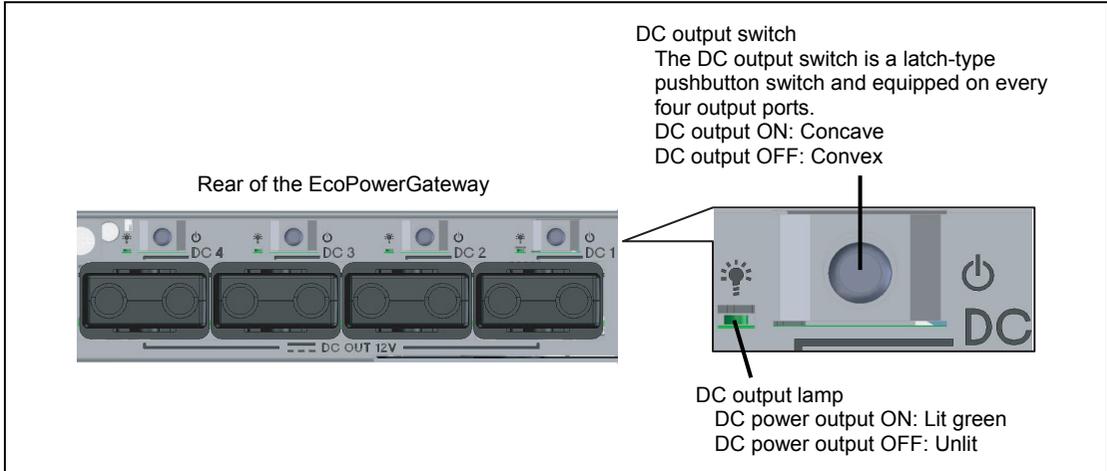
The server is powered on when the DC output switch on N8142-36 EcoPowerGateway is pressed and the POWER switch on the front is pressed.

1. Check if DC power cable is properly connected.
The cable connectors have locking mechanism.
Make sure that the cable connector is surely locked.



IMPORTANT: Incomplete locking of DC power cable connector may cause power leakage, electric shock due to the spark, hardware failure as well as malfunction of the server.

2. Press the POWER switch on the front of N8142-36 EcoPowerGateway, and then firmly press the DC output switch on the rear.
Make sure that the DC output lamp goes on green.



IMPORTANT: Never attempt to connect/disconnect the DC power cable while the DC power is being output. The DC power cable and connectors for the server input ports and EcoPowerGateway output ports do not support hot-swap mode.

Power Off (when using the DC power model)

Take the following steps to power off the server.

1. Shut down the OS.
2. Make sure the POWER LED is off.
3. Power off peripheral devices.

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.

The NEC logo is displayed in a large, bold, black font, centered within a rectangular border.

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**.)

NOTE: You can set the POST check results to appear on the display unit without pressing **Esc**. To do so, select "Enabled" for "Boot-time Diagnostic Screen" under the Advanced menu of the BIOS setup utility.

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 server. Also, it may take approximately one minute for the screen display to appear after rebooting the server.
2. Some messages appear upon completion of the memory check. These messages appear to indicate that the system has detected the CPU, keyboard, and mouse.
3. After a few seconds, POST displays the following message prompting you to launch the BIOS setup utility, stored in the system memory of the server. This message appears at bottom left on the screen.

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

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

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

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

4. If your server uses onboard RAID Controller (LSI Embedded MegaRAID™), the following message is displayed on the screen to prompt you to run the utility.

Press Ctrl-M to run LSI Software RAID Configuration Utility

Press **Ctrl + M** to run the utility. For details, see 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 or the SCSI BIOS setup utility. Refer to the manual supplied with the RAID controller for detailed instructions. POST will automatically proceed a few seconds later.
6. If you set a password entry using the BIOS setup utility, the password entry screen appears upon successful completion of POST.

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

7. The OS starts when POST completes.

POST Error Messages

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

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

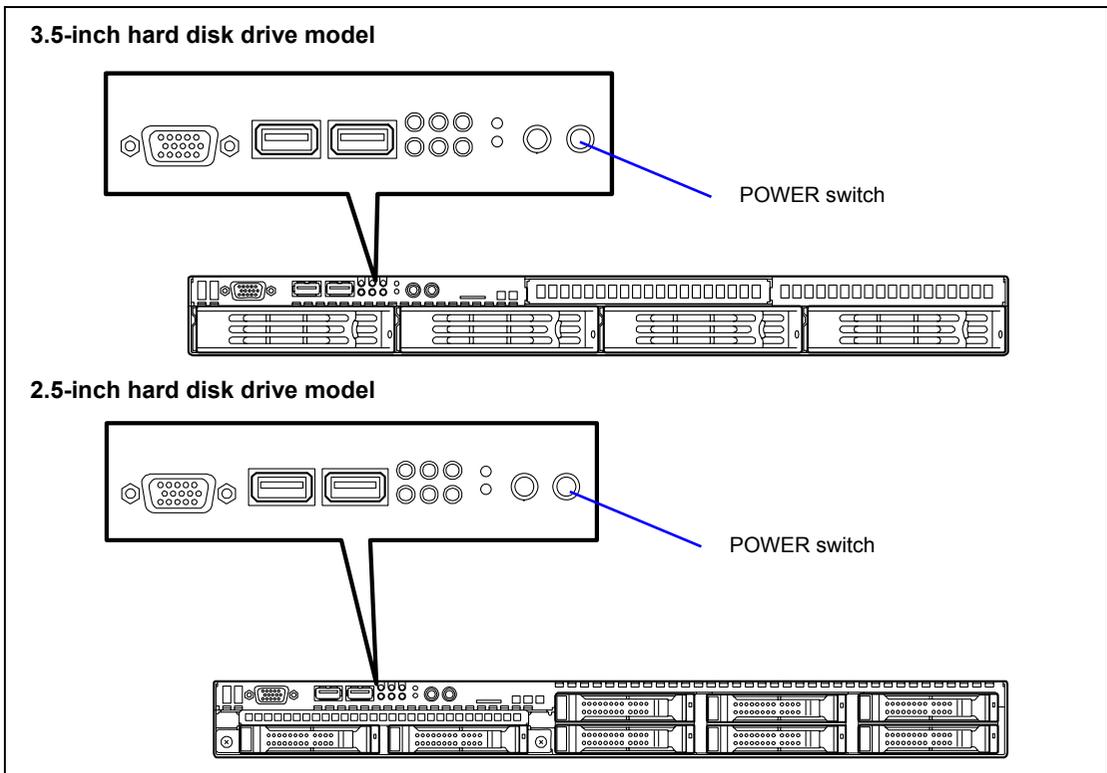
Power-saving Mode

The server can be entered into standby state that hardly consumes electric power if the ACPI compliant operating system is installed in your system.

Select "Standby" from OS shutdown menu, or press the POWER switch if the standby state is enabled for POWER switch. (The POWER LED 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 POWER switch again.

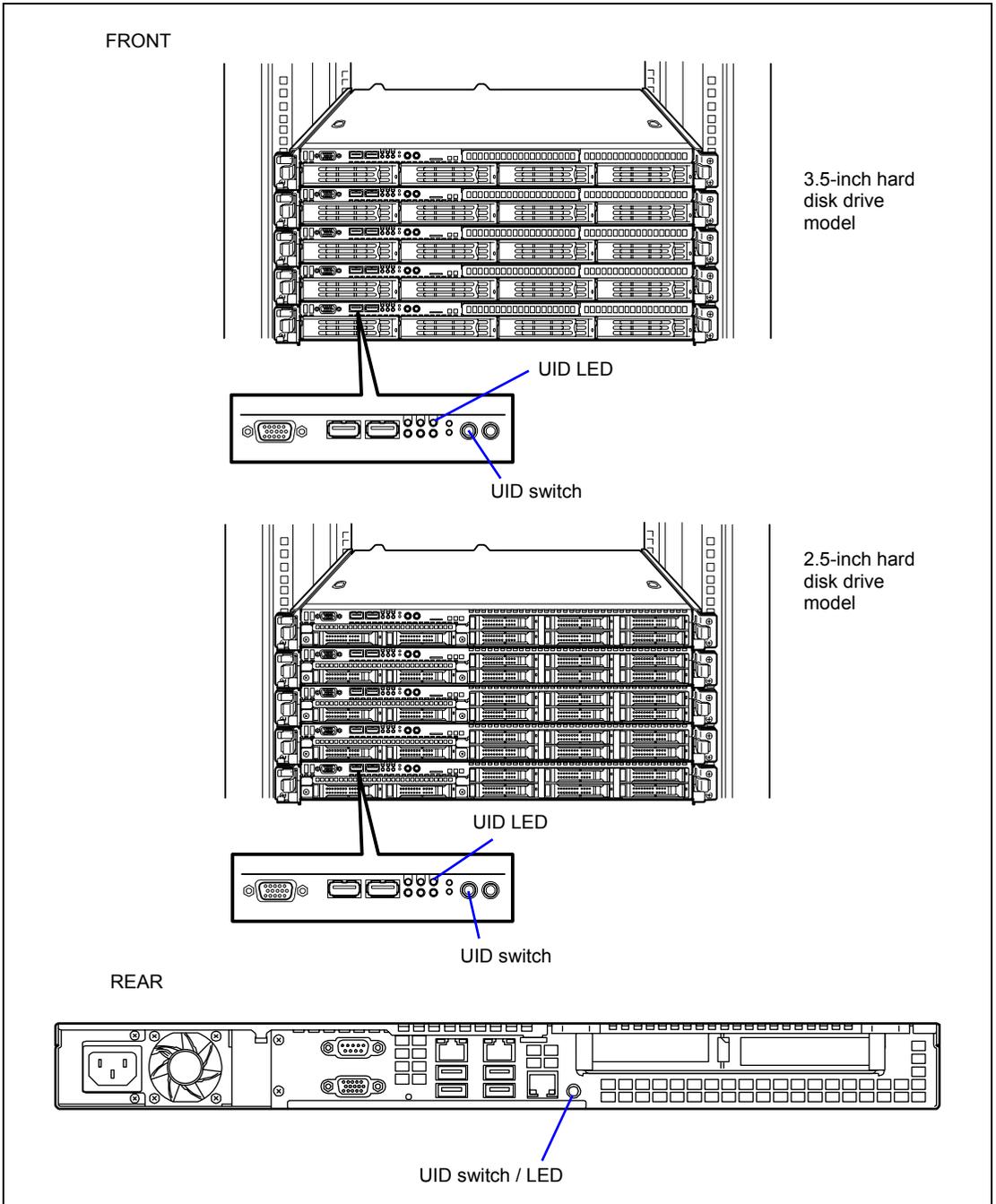


NOTE: The operational level in the power-saving mode depends on the OS in use. (Available for Windows Server 2003.)

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.

Identification of Servers ~ UID Switch ~

An "UID (Unit ID) LED" is provided on the front panel and rear panel. If more than one server is mounted in a single rack, the LED identifies the server you are going to maintain.



The UID LED goes on when the UID (Unit ID) switch is pressed. It goes off when the switch is pressed again.

The UID LED blinks upon reception of command from software.

Maintenance from the rear of the rack has to be carried out in a dark, narrow space. The interface cable of a server or power supply unit in normal state may be disconnected by accident in this situation. To prevent this problem, you should start maintenance after confirming the target server by using the UID switch.

Flash FDD

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

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

⚠ CAUTION



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

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

IMPORTANT:

- The status of the write protection switch of the Flash FDD from before it is connected to this server is applied. Therefore, flipping this switch after connecting the Flash FDD has no effect. If it is necessary to flip this switch during use, temporarily disconnect the Flash FDD from the server, and then flip the switch.
 - Be careful not to accidentally slide the write protection switch while connecting the Flash FDD to or disconnecting it from the server.
-

Notes

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

Compensation for recorded data

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

Notes on handling the Flash FDD

- Do not turn off the server while the access LED of the Flash FDD is blinking. Turning off the server at this time can cause a failure or data corruption.
- The Flash FDD is a consumable.
If the Flash FDD causes an error, use a new Flash FDD.
- The Flash FDD cannot be connected by way of a USB hub.
Directly connect the Flash FDD to a USB connector of the server.
- Before touching the Flash FDD, discharge static electricity from your body by touching a nearby metal object (such as a doorknob or aluminum frame).
- Do not disassemble the Flash FDD.
- Do not apply a strong force to the Flash FDD.
- Do not place the Flash FDD in an area directly exposed to sunlight or near a heater.
- Do not handle the Flash FDD while eating, drinking, or smoking. Also, be careful not to get thinner, alcohol, or other corrosive substances on the Flash FDD.
- Be careful when connecting the Flash FDD to the server.
- Do not move the server or Flash FDD while the Flash FDD is inserted into a server USB connector. Doing so might cause a Flash FDD failure.
- After using the Flash FDD, disconnect it from the server.

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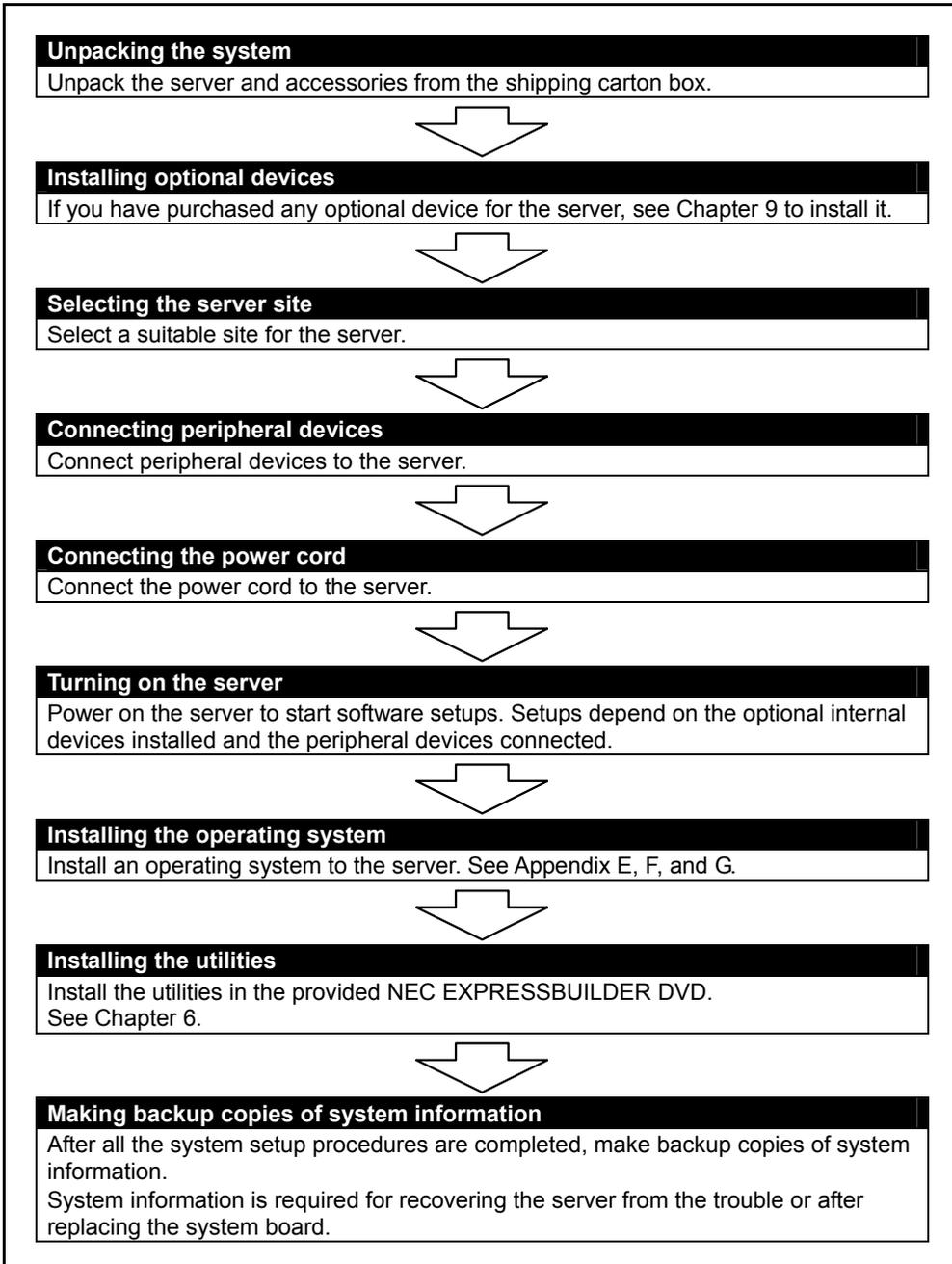
Chapter 3

Setting Up Your Server

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

SETUP FLOW

Follow the flowchart below to set up the server.



UNPACKING THE SYSTEM

When you receive your system, inspect the shipping containers prior to unpacking. If the shipping boxes are damaged, note the damage, and if possible, photograph it for reference. After removing the contents of the containers, keep the cartons and the packing materials. If the contents appear damaged when you unpack the boxes, file a damage claim with the carrier immediately.

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 disk drives, 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

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

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

WARNING



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

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

CAUTION



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

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

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

- Narrow space from which devices cannot be pulled out from the rack completely
- Place that cannot bear the total weights of the rack and devices mounted on the rack
- Place where stabilizers cannot be installed or where the rack can be installed only after the practice of proper earthquake-resistant construction
- Place of uneven or slanting floor
- Place of drastic temperature change (near a heater, air conditioner, or refrigerator)
- Place where intense vibration may be generated
- Place where corrosive gases (sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, ozone, etc) exist.
Place where the air (or dust) includes components accelerating corrosion (ex. sulfur, sodium chloride) or conductive metals.
Place where chemicals may be accidentally sprayed over
- Place where a carpet not subject to anti-static process is laid.
- Place where some objects may be fallen on the rack
- Place near a device generating intense magnetic field (such as a TV, radio, broadcast/communication antenna, power transmission wire, and electromagnetic crane) is placed (If unavoidable, contact your service representative to request proper shield construction.)
- Place where the power cord of the server must be connected to an AC outlet that shares the outlet of another device with large power consumption.
- Place near equipment that generates power noise (e.g., contact spark at power-on/power-off of commercial power supply through a relay). If you must install the server close to such equipment, request your service representative for separate power cabling or noise filter installation.

IMPORTANT: Increase in temperature within rack and air flow

If more than one server are installed on the rack or the ventilation within the rack is not enough, the temperature in the rack may be raised by the heat generated from the units to be higher than the operation temperature of the server (10 to 35°C).

It causes the server to operate improperly. Review the air flow within the rack or in the room and take sufficient measures so that the temperature within the rack does not exceed the warranted temperature range during the system operation.

The server takes in the air from the front and exhausts it to the rear.

INSTALLING THE SERVER

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

WARNING



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

- Do not use any rack which does not conform to the relevant standard.
- Always use the server in the specified place.

CAUTION



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

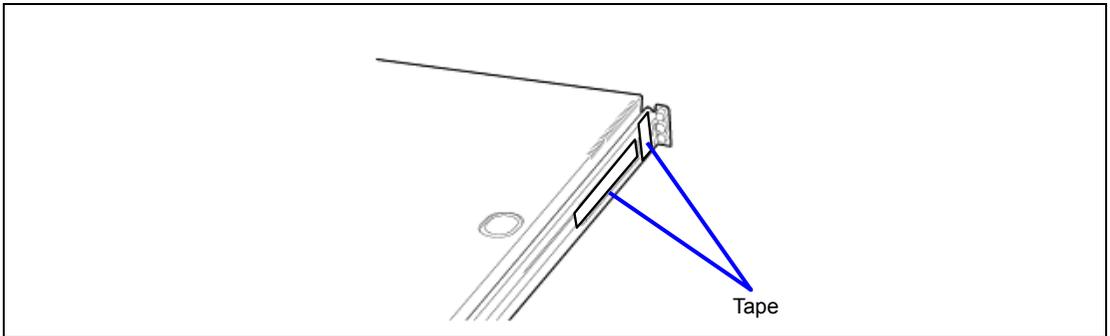
- Do not install/remove the server in/from the rack only by a single person.
- Do not install the server on the rack leaving the cover removed.
- Do not pinch your finger with mechanical components.
- Do not apply any load on the server being pulled out from the rack.

Installation

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

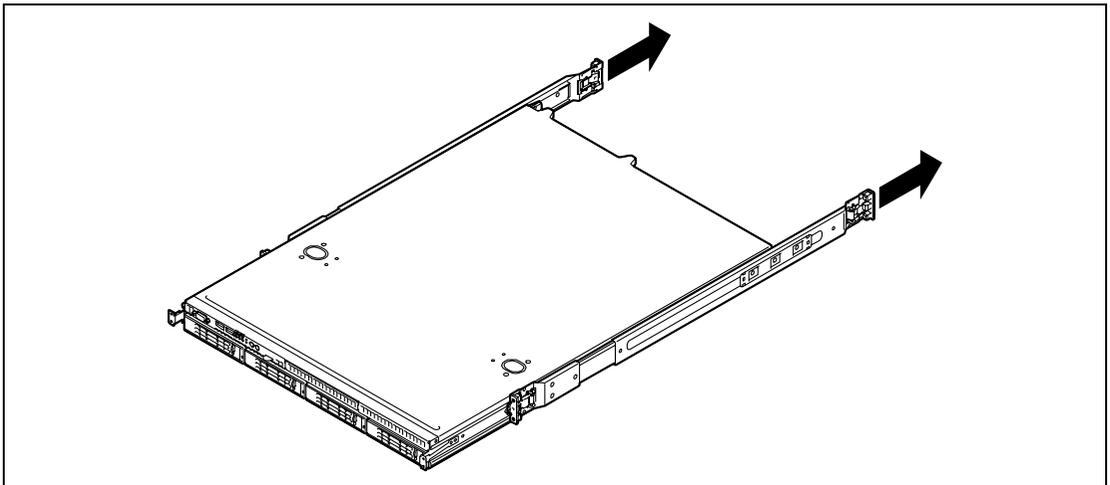
Preparation for installation

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

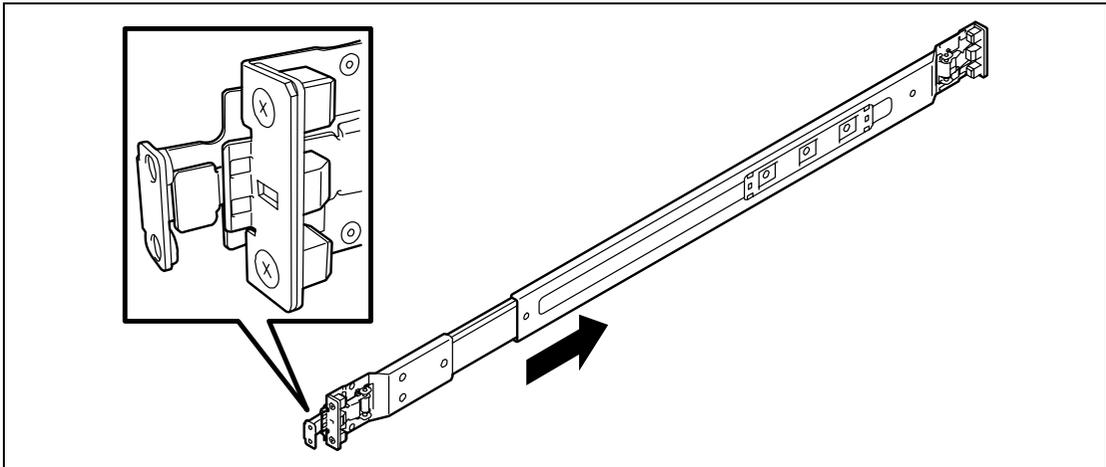


Removing rail assemblies

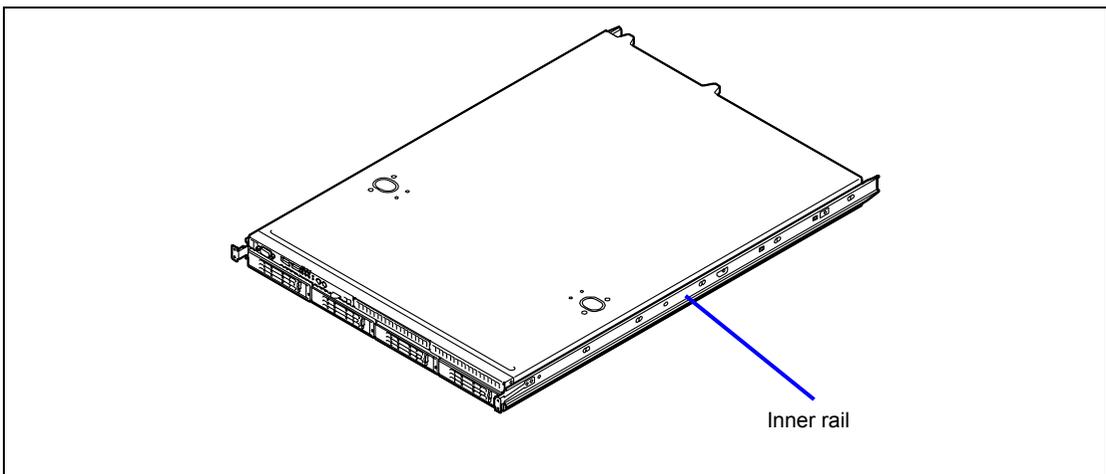
1. Remove the sliding rails from left and right sides of the server.



2. While pushing the unlock button on the front of the server, hold the rails and slowly move them toward the rear of the server.



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



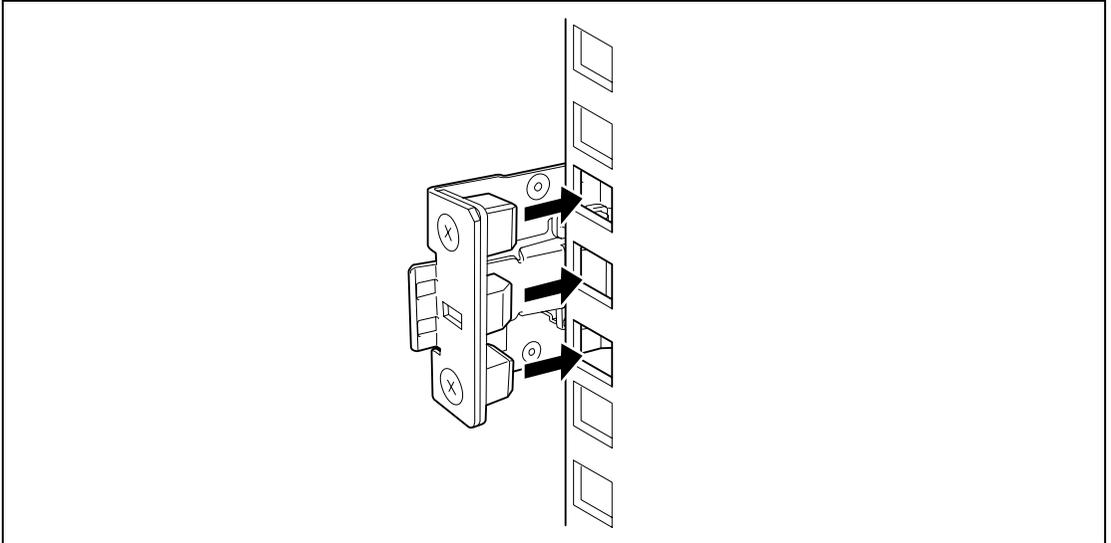
IMPORTANT:

- The removed rail assemblies are to be installed in the next step.
 - Be very careful not to get your finger caught in the levers or rails.
-

Installing rail assemblies

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

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



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

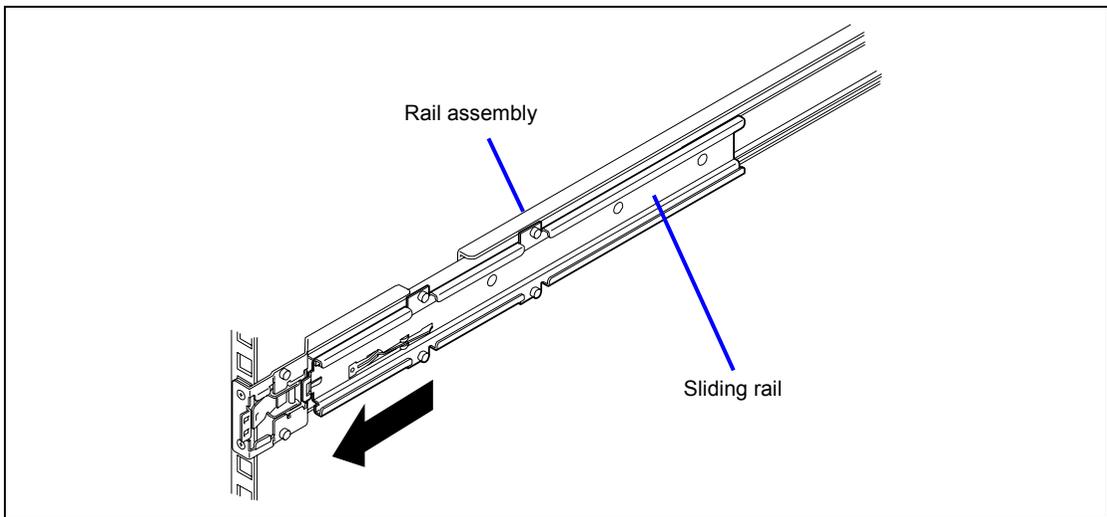
NOTES:

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

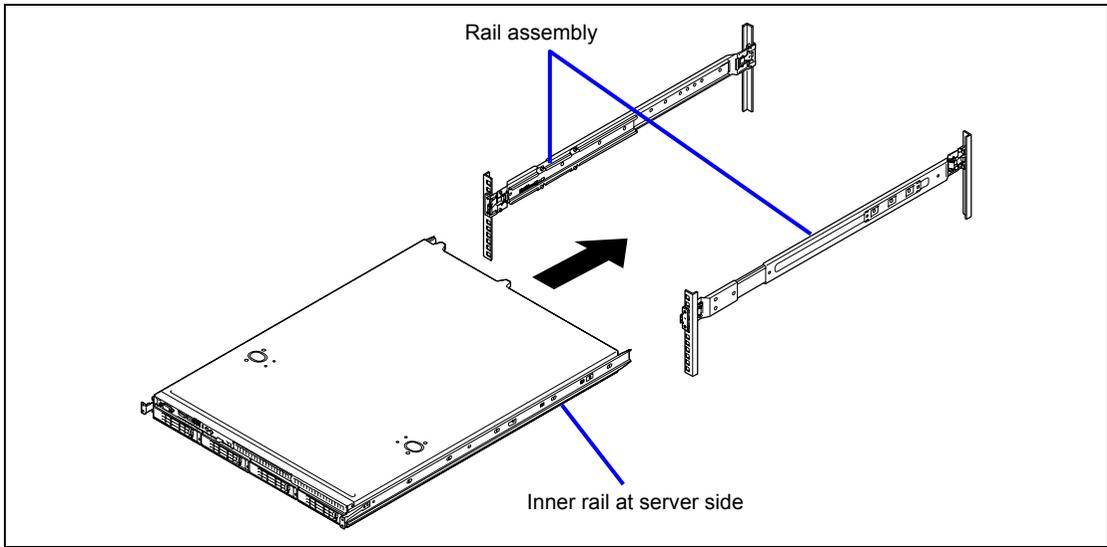
Installing the Server

⚠ CAUTION	
	<p>Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details.</p> <ul style="list-style-type: none">■ Do not lift the server only by a single person.■ Do not pinch your finger with mechanical components.

1. Pull out the sliding rails (bearing portion) of the right and left rail assemblies toward the front of the server.



2. Securely hold the server and install it in the rack with at least two persons.



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

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

IMPORTANT:

- Be very careful not to get your finger caught in the levers or rails.
 - Insert both sides of inner rails straight into the rack.
 - Hold the thumbscrews on both sides of the server, and install the server carefully while making sure the installation position.
-

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

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

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

Removal

Remove the server from the rack in the following procedure.

⚠ CAUTION	
	<p>Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details.</p> <ul style="list-style-type: none">■ Do not install/remove the server in/from the rack only by a single person.■ Do not pinch your finger with mechanical components.■ Do not apply any load on the server being pulled out from the rack.■ Do not pull out a device from the rack if the rack is unstable.■ Do not leave more than one device being pulled out from the rack.■ Do not pull out the server from the rack while it is operating.

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

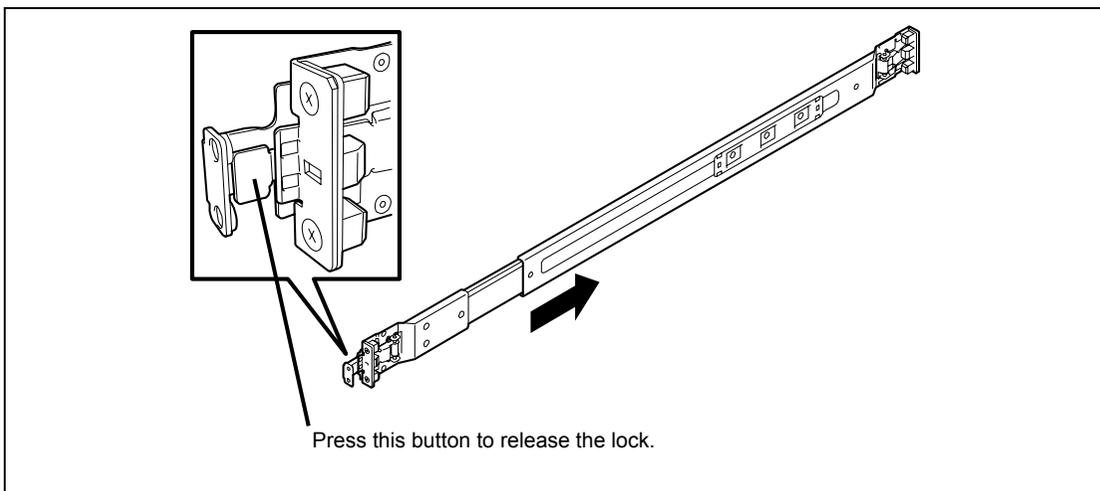
IMPORTANT:

To power on the server, press the DC output switch on N8142-36 EcoPowerGateway.

NOTE: To check if the server is off-powered, make sure that the DC output lamp on N8142-36 EcoPowerGateway is unlit.

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

The server clicks to be latched.

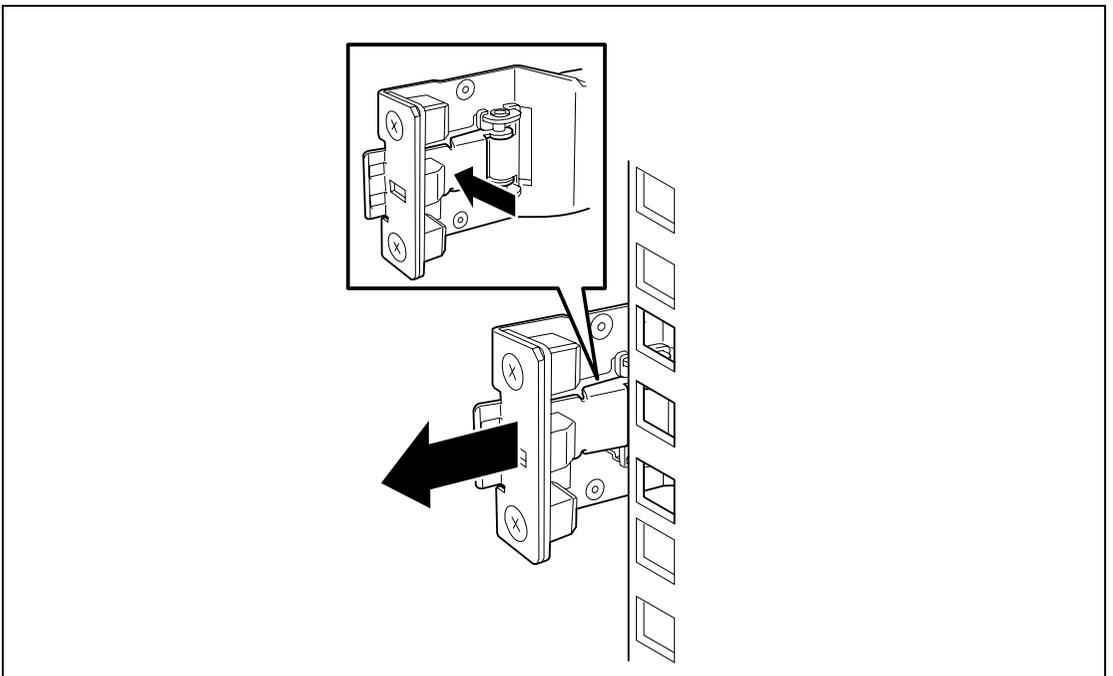


3. Firmly hold the server, and take it out from the rack.

IMPORTANT:

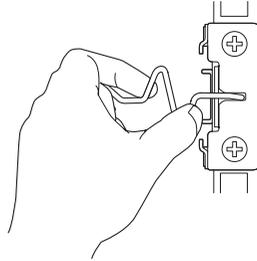
- Pull out the server slowly holding the bottom of the server by at least two persons.
 - Do not apply any load on the server pulled out from the rack. Doing so may cause personal injury if the server drops.
 - Be very careful not to get your finger caught in the levers or rails.
-

4. To remove the rail assembly, pull out the rail toward you while pushing the lever.

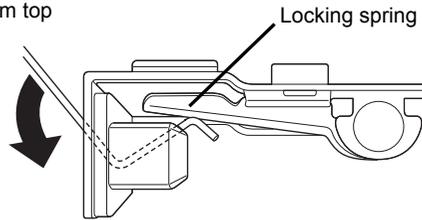


NOTE: If two or more rail assemblies are installed, you may be unable to push the unlocking lever by your hand. In such a case, use the tool to remove the sliding rail (outer rail) to unlock the rail assembly. The tool is provided with your server.

Viewed from front



Viewed from top



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.

IMPORTANT: Consult with your service representative if you want:

- to connect the server to UPS or automatic power control unit
- to run the server by scheduled timer
- to connect the server to server switch unit and configure it

WARNING



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

- Do not hold the power plug with a wet hand.
- Do not connect the ground wire to a gas pipe.

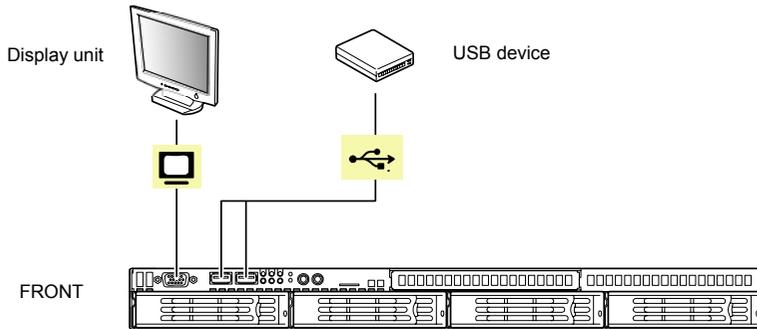
CAUTION



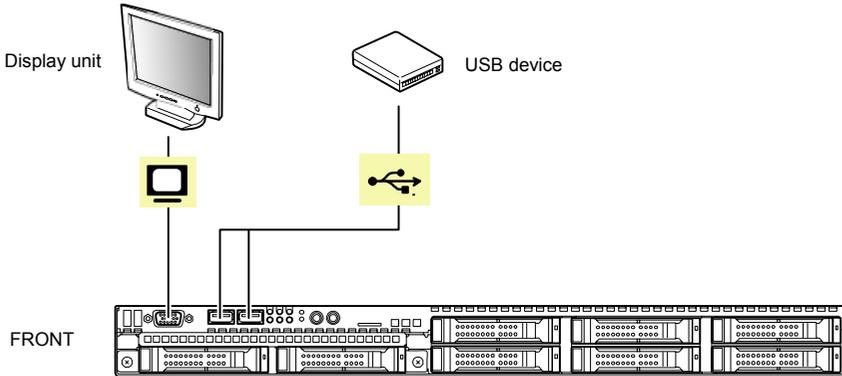
Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details.

- Do not plug the power cord in to an improper power source.
- Do not connect the power cord to an outlet that has an illegal number of connections.
- Insert the power plug into the outlet as far as it goes.
- Use the authorized power cord only.
- Do not connect any interface cable with the power cord of the server plugged to a power source.
- Do not use any unauthorized interface cable.

3.5-inch hard disk drive model

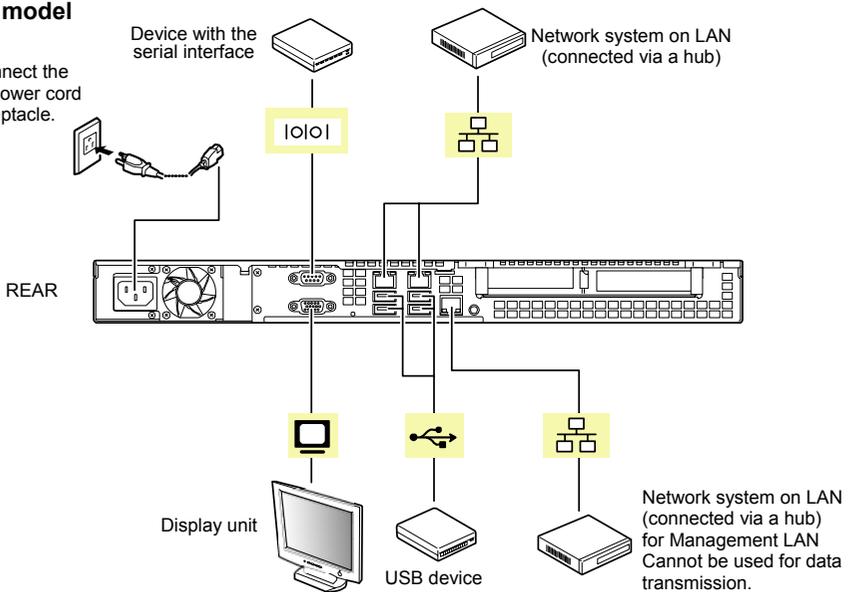


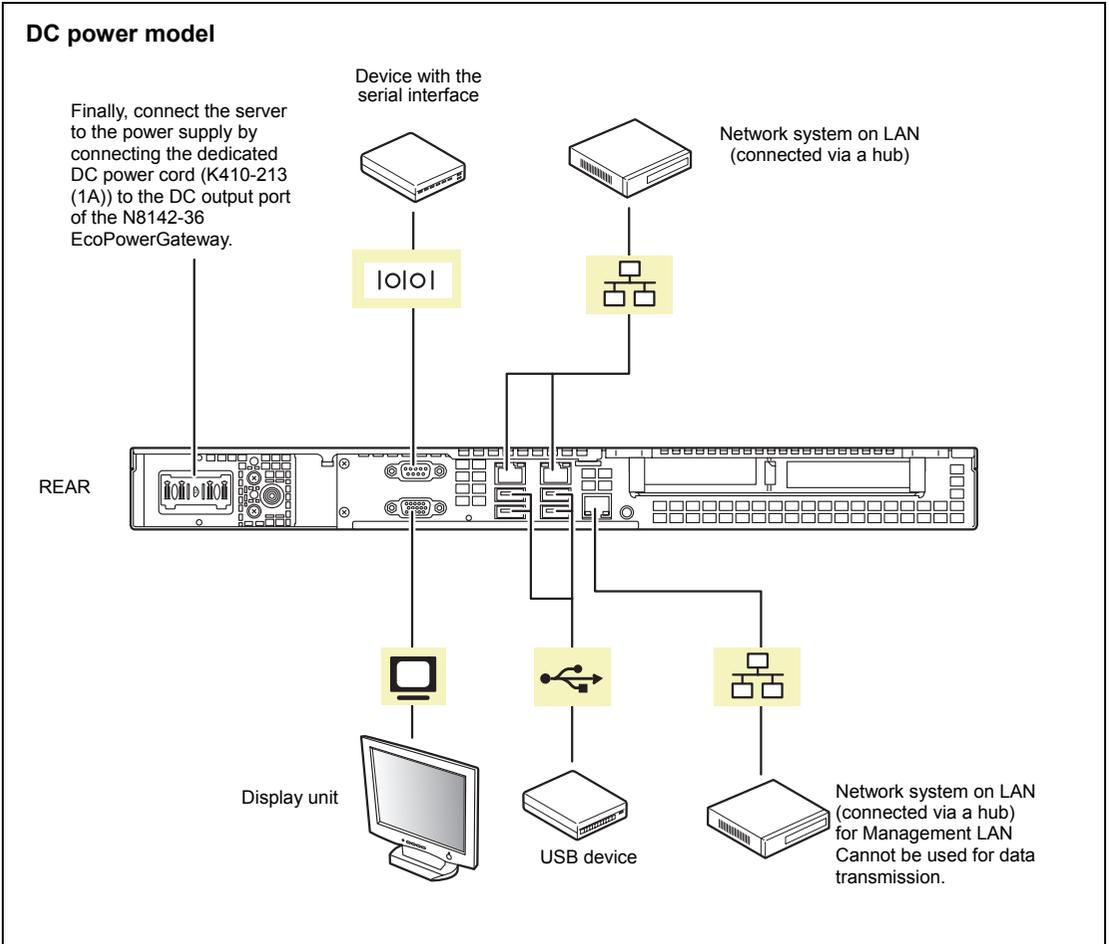
2.5-inch hard disk drive model



AC power model

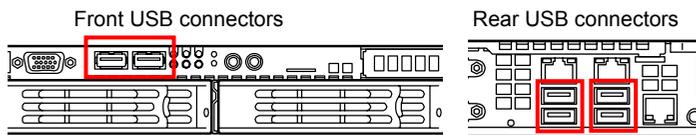
Finally connect the provided power cord to the receptacle.





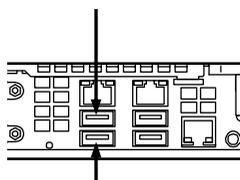
IMPORTANT:

- Power off the server and a peripheral device before connection. Connecting a powered peripheral device to the powered server will cause malfunctions and failures.
- To connect a third-party peripheral device or interface cable to the server, consult with your service representative for availability of such a device or cable. Some third-party devices may not be used for the server.
- To connect a SCSI device, an optional SCSI controller must be installed. The total length of a cable (including the connection cable in SCSI device) must be 3 m or shorter.
- Do not connect the serial ports with the telephone line directly.
- Do not connect any devices to the connectors not instructed in this subsection. Doing so could damage the device, your server, or both.
- When you connect an optional USB DVD-ROM drive, do not use the adjacent port for any other USB device. As shown in the figure below, the adjacent ports are enclosed with the red rectangular.



Ex.) Connect an optional USB DVD-ROM drive to the rear USB port:

Connect a DVD-ROM drive



Do not connect any other USB device.

If you install the server on the rack and connect peripherals, bundle the cables by using cable tie or the like so that they are not entangled.

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

CONNECTING POWER CORD

Connect the provided power cord to the server.

WARNING



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

- Do not hold the power plug with a wet hand.
- Do not connect the ground line to gas pipe.

CAUTION

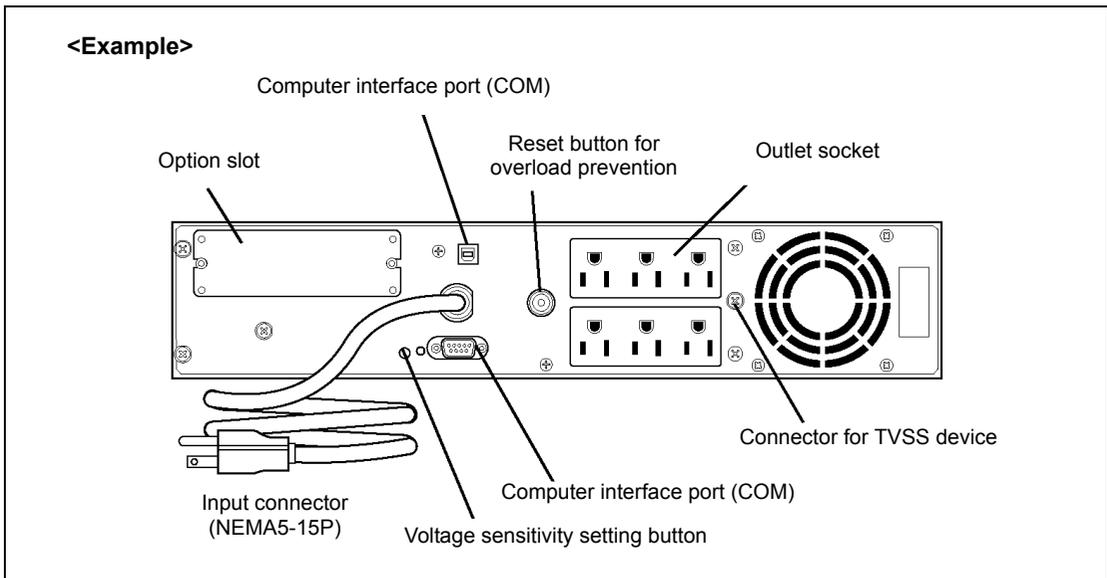


Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details.

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

1. Plug the provided power cord into the power receptacle on the rear of the server.
2. Plug the other end of the power cord into the wall outlet.

To connect the power cord from the server to an interruptive power supply (UPS), use outlet socket on the rear of the UPS. Refer to the manual that comes with the UPS for details.



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

TURNING ON THE SERVER

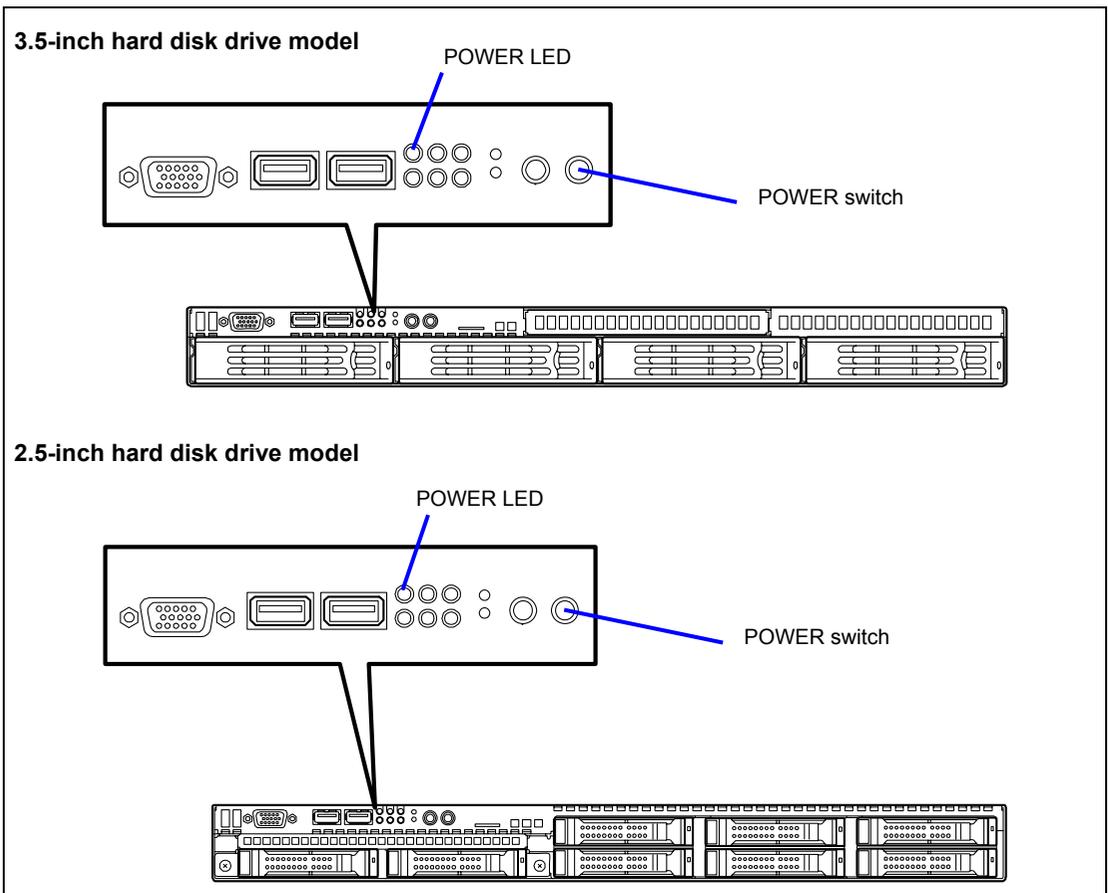
Pressing the POWER switch at the front of the server turns on the server.

1. Make sure that the floppy disk drive (if connected) contains no floppy disk.
2. Power on the video display and any other external devices.

NOTE: If the power cord is connected to the power control unit such as the UPS, turn on the power control unit.

3. Press the POWER switch.

The POWER LEDs on the front and the rear of the server come on green. In a few seconds, the NEC logo appears on the screen.



NOTE: Connect the power cord and wait about five 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.

The Power On Self-Test (POST) runs while "NEC" logo is displayed to diagnose the system hardware. See "POST" described later for details.

Upon completion of POST, the OS starts.

NOTE: When the POST detects any error, it displays an error message and its measure on the display unit. See Chapter 8 for details of POST error message.

INSTALLING OPERATING SYSTEM

See Appendix F or G for installing a Microsoft Windows Server 2003 operating system.

To install another operating system, 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 details.

INSTALLING UTILITIES

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

RACK MOUNT INSTRUCTIONS

The following or similar rack-mount instructions are included with the installation instructions.

- Elevated Operating Ambient

If installed in a closed or multi-unit rack assembly, the operating ambient temperature or the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.

- Reduced Air Flow

Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

- Mechanical Loading

Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

- Circuit Overloading

Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuit might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

- Reliable Earthing

Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

MAKING BACKUP COPIES OF SYSTEM INFORMATION

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

Save the information after completing the system setup.

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

You can save the information by the following process.

- 1.** Connect Flash FDD or USB FDD to the USB connector.
- 2.** Insert the NEC EXPRESSBUILDER DVD into the optical disk drive and restart the system.
- 3.** Select [Tool menu (Normal mode)].
- 4.** Select [English].
- 5.** Select [Maintenance Utility].
- 6.** Select [System Information Management].
- 7.** 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.

The RAID configuration utility configures the RAID System and logical drives connected to the Onboard RAID controller.

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

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

SYSTEM BIOS (SETUP)

The SETUP utility is used to change system configuration parameters. This utility is pre-installed in the flash memory of the server and ready to run.

The server is configured with the correct parameters using the SETUP utility and shipped 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: Supervisor and User. With the Supervisor password, you can view and change all system parameters of the SETUP utility. With the User password, system parameters available for viewing and changing are limited.
 - Do not set any password before installing the OS.
 - The server contains the latest version of the SETUP utility. Dialog boxes 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 service representative.
 - Use the Exit menu when exiting the SETUP utility. Exiting the utility with the POWER switch or reset operation causes the stored parameters to lose.
-

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.

Indicates there are submenus.

Online help window

Setup item menu(s)*

Explanation of key functions menu

Parameter (high-lights upon selection) menu

* The menus displayed in gray indicates the information only or unchangeable secured by BIOS password.

- 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** Exit SETUP and return to the previous screen.
- F9:** Sets the parameter of the currently displayed item back to the factory set parameter.
- F10:** Save and exit the SETUP utility.

Configuration Examples

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

Time and Date Settings

Select [Main] - [System Time].

Select [Main] - [System Date].

UPS

To link power supply with the UPS

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

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

- To keep the server off-powered even when power is supplied from the UPS, when the POWER switch is used to turn off the server.

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

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

Select [Server] - [AC LINK] - [Stay Off].

Boot

To change the boot order of devices connected to the server

Select [Boot] and specify the boot order.

To display POST check results

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

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

To use the remote wakeup feature

Via modem:

Select [Advanced] - [Advanced Chipset Control] - [Wake on Ring] - [Enabled].

Via RTC alarm:

Select [Advanced] - [Advanced Chipset Control] - [Wake on RTC Alarm] - [Enabled].

To control from the HW console

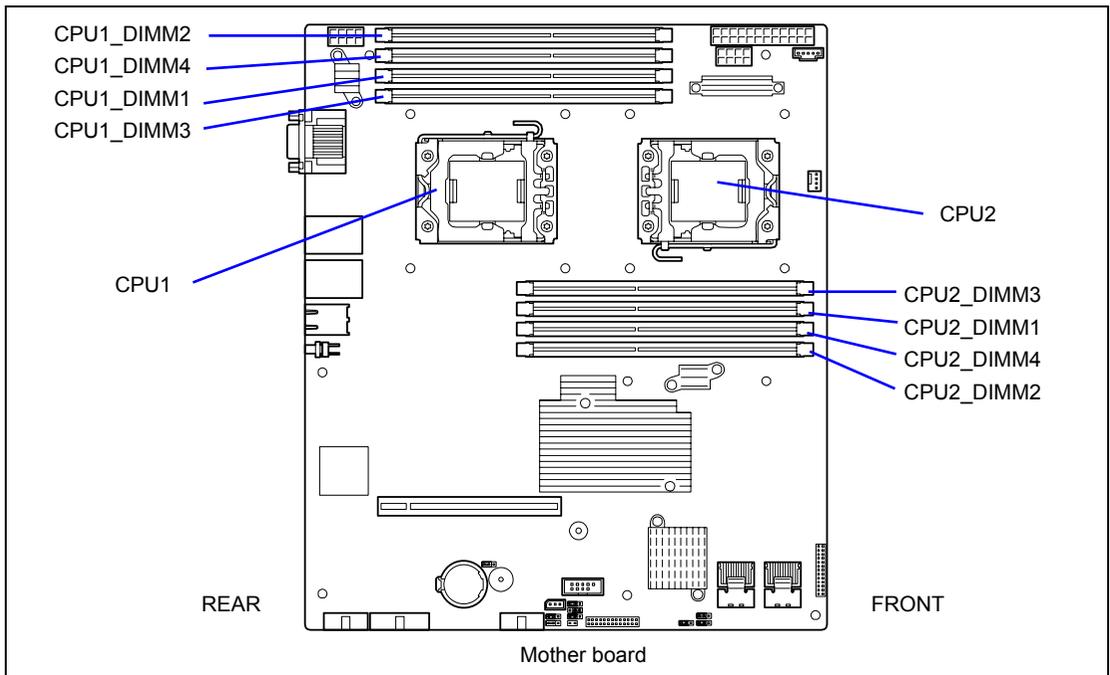
Select [Server] - [Console Redirection] and set each item.

Memory

To check the installed memory (DIMM board) status

Select [Advanced] - [Memory Configuration] - [CPU1_DIMM n Status] or [CPU2_DIMM n Status], and check the status indications (n: 1, 2, 3, or 4).

The on-screen DIMM numbers and socket locations on the mother board are associated as shown in the following figure.



To clear the memory (DIMM board) error information

Select [Advanced] - [Memory Configuration] - [Memory Retest] - [Yes] and reboot.

CPU

To check the installed CPU status

Select [Main] - [Processor Settings] and check the status indications.

To clear the CPU error information

Select [Main] - [Processor Settings] - [Processor Retest] - [Yes] and reboot.

The on-screen CPU numbers and socket locations on the mother board are associated as shown in the above figure.

Keyboard

To set Numlock

Select [Advanced] - [Numlock] – [On]/[Off]. (Default: Off)

System Event Logs

To clear system event logs

Select [Server] - [Event Log Configuration] - [Clear All Event Logs] - [Enter] - [Yes].

Security

To set passwords on the BIOS

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

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

Set Supervisor password first, then User password.

External Devices

To setup I/O ports

Select [Advanced] - [Peripheral Configuration] and set up each I/O port.

Internal Devices

To configure the internal PCI device

Select [Advanced] - [PCI Configuration] and setup each devices.

To install the RAID controller

Select [Advanced] - [PCI Configuration] - [PCI Slot n Option ROM] - [Enabled].
n: PCI slot number

To clear the hardware configuration data (after installing/removing internal devices)

Select [Advanced] - [Reset Configuration Data] - [Yes] and reboot.

Saving the Configuration Data

To save the current configuration data and exit from SETUP

Select [Exit] - [Exit Saving Changes].

To discard changes to the current configuration data

Select [Exit] - [Exit Discarding Changes].

Select [Exit] - [Discard Changes].

To load the default setup (may differ from the factory-set value)

Select [Exit] - [Load Setup Defaults].

To save the current configuration data

Select [Exit] - [Save Changes].

To save the current configuration data as Custom Defaults

Select [Exit] - [Save Custom Defaults].

To load the Custom Defaults

Select [Exit] - [Load Custom Defaults].

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
System Time	HH:MM:SS	Set the system time.	
System Date	MM/DD/YYYY	Set the system date.	
Hard Disk Pre-Delay	[Disabled] 3 seconds 6 seconds 9 seconds 12 seconds 15 seconds 21 seconds 30 seconds	When accessing the IDE device for the first time during POST, the system waits for the specified time until the device becomes ready.	
SATA Port 0 SATA Port 1 SATA Port 2 SATA Port 3 SATA Port 4 SATA Port 5	–	Shows the information on the device connected to each channel on the submenu. The settings of some items may be changed. However, leave the items as they are at the shipment.	
Processor Settings	–	Shows the processor settings submenu.	
Language	[English] Français	Select which language BIOS displays.	

[]: Factory-set

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

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

Check the system clock at the rough rate of once per month. When the system clock is installed in a system requiring high time precision, it is recommended to use a time server (NTP server).

If the system clock is remarkably delayed or advanced as the passage of time in spite of adjustment, contact your service representative for maintenance.

Processor Settings

Option	Parameter	Description	Your Setting
Processor Speed Setting	–	Displays clock speed for the processor. (View only)	
Processor 1 CPUID	Numeral Disabled Not Installed	"Numeral" indicates CPU ID for processor 1. "Disabled" indicates that the processor is defected. "Not Installed" indicates that no processor is installed. (View only)	
Processor 1 L2 Cache	–	Displays L2 cache size for processor 1.	
Processor 1 L3 Cache	–	Displays L3 cache size for processor 1.	
Processor 2 CPUID	Numeral Disabled Not Installed	Displays CPU ID for processor 2, if present. "Disabled" indicates that the processor is defected. "Not Installed" indicates that no processor is installed. (View only)	
Processor 2 L2 Cache	–	Displays L2 cache size for processor.	
Processor 2 L3 Cache	–	Displays L3 cache size for processor.	
Active Processor Cores	[ALL] 1 2	Specifies the number of valid cores in the processor.	
Hyper-Threading Technology	Disabled [Enabled]	Enables or disables the Intel(R) Hyper Threading technology.	
Execute Disable Bit	Disabled [Enabled]	Enables or disables the Execute Disable Bit feature. Displayed only when the CPU supports Execute Disable Bit.	
Intel SpeedStep(R) Technology	Disabled [Enabled]	Enables or disables the Intel(R) SpeedStep feature. Fixed to "Disabled" if the processor does not support this feature.	
Turbo Boost Technology	Disabled [Enabled]	Enables or disables the Intel(R) Turbo Boost Technology.	
Performance/Watt	Traditional [Power Optimized]	Optimized - Turbo Boost engages after highest performance state is sustained for more than 2 seconds. Traditional - Intel(R) Turbo Boost Technology is engaged immediately when possible.	
C1 Enhanced Mode	Disabled [Enabled]	Enables or disables the C1 Enhanced Mode.	
Processor C3 Report	Disabled ACPI C2 [ACPI C3]	Select the processor C3 State.	
Virtualization Technology	Disabled [Enabled]	Enables or disables the Intel(R) virtualization technology.	

[]: Factory-set

Option	Parameter	Description	Your Setting
Server Class	Enterprise [HPC] Custom	Select the performance level of processor. Enterprise: Specify when using the server with less power consumption. HPC: Specify when using the server with high performance. Custom: Specify when providing setting individually.	
Hardware Prefetcher	Disabled [Enabled]	Specify whether to enable or disable the Hardware Prefetcher of the processor. This menu appears and becomes accessible when [Custom] is specified for [Server Class].	
Adjacent Cache Line Prefetch	Disabled [Enabled]	Specify whether to enable or disable the optimal access to the cache line from the memory. This menu appears and becomes accessible when [Custom] is specified for [Server Class].	
L1 Dat Prefetcher	Disabled [Enabled]	Specify whether to enable or disable the prefetcher of the L1 data. This menu appears and becomes accessible when [Custom] is specified for [Server Class].	
Data Reuse Optimization	Disabled [Enabled]	Specify whether to enable or disable the optimal reuse of data. This menu appears and becomes accessible when [Custom] is selected for [Server Class].	

[]: Factory-set

Advanced

Option	Parameter	Description	Your Setting
Boot-time Diagnostic Screen	[Disabled] Enabled	When enabled, the BIOS will display the POST progress. When disabled, the BIOS will display the NEC logo during POST. Cannot be disabled during console redirection.	
Reset Configuration Data	[No] Yes	Select "Yes" if you want to clear the system configuration data during the next boot. Automatically reset to "No" in the next boot.	
NumLock	On [Off]	Enables or disables Numlock feature at system startup.	
Memory Error	[Boot] Halt	If "Halt" is selected, the boot is stopped when POST error occurs.	

[]: Factory-set

IMPORTANT: Be sure to take a note of boot priority before selecting "Yes" for [Reset Configuration Data], because the information on boot device will be cleared. Select [Exit Saving Changes] to restart the system, run BIOS SETUP utility, and provide settings for boot device order again.

Memory Configuration

Option	Parameter	Description	Your Setting
Installed memory	–	Indicates the total capacity of the base memory. (View only)	
Available under 4GB	–	Indicates the capacity of memory available in the area under 4GB. (View only)	
CPU1_DIMM1-4 Status CPU2_DIMM1-4 Status	Normal Disabled Not installed Error	Indicates the current memory status. "Normal" indicates the normal status, "Disabled" indicates a memory error, "Not installed" indicates no DIMM is installed, and "Error" indicates the system is forcibly started with memory error. (View only).	
Memory Retest	Yes [No]	Causes BIOS to retest all memory on the next boot. Automatically reset to "No" at the next boot.	
Extended RAM Step	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. Only pressing Space is acceptable to suspend the test during the memory test.	
Memory RAS Mode	[Independent] LockStep	The server does not support this feature. Use the factory-set value as is.	
Memory Frequency	Auto 1067MHz [1333MHz]	Specify the memory clock frequency.	
Memory Voltage	[Low] Normal	Specify the voltage at which the memory operates. Selecting Normal increases power consumption, but the memory operation clock speeds up.	
NUMA configuration	Disabled [Enabled]	Disables or enables Non-Uniform Memory Access feature.	

[]: Factory-set

PCI Configuration

Option	Parameter	Description	Your Setting
PCI Slot 1-2 Option ROM	[Enabled] Disabled	Disables or enables option ROM scan for PCI board in PCI slot.	

[]: Factory-set

IMPORTANT: If the RAID Controller, LAN board (network boot), or Fibre Channel controller is connected with the hard disk drive that does not contain an OS, set the parameter for "PCI Slot x Option ROM" (x: slot containing the PCI card) to "Disabled".

– Onboard Video Controller submenu

Option	Parameter	Description	Your Setting
VGA Controller	Disabled [Enabled]	If Disabled, the BIOS will hold the embedded chip in reset.	
Onboard VGA Option ROM Scan	[Auto] Force	Selects whether the option ROM of onboard video controller is executed automatically for forcedly.	

[]: Factory-set

– Onboard LAN 1-2 submenu

Option	Parameter	Description	Your Setting
LAN Controller 1-2	Disabled [Enabled]	Enables or disables onboard LAN controller.	
LAN1-2 Option ROM Scan	Disabled [Enabled]	Enables or disables an option ROM of onboard LAN controller 1-2.	
PXE/iSCSI Select	[PXE] iSCSI	Selects Boot Option for Network Devices.	

[]: Factory-set

Peripheral Configuration

IMPORTANT: Note that the interrupt and/or base I/O address are not overlapped with others. If the value set for the interrupt or base I/O address is used in another resource, the yellow asterisk (*) appears. Reset any item with the yellow asterisk properly.

Option	Parameter	Description	Your Setting
Serial Port A	Disabled [Enabled]	Selects whether serial port A is enabled or disabled.	
Base I/O address	[3F8h] 2F8h 3E8h 2E8h	Selects the base I/O address for serial port A.	
Interrupt	IRQ 3 [IRQ 4]	Selects the interrupt for a serial port A.	
Serial Port B	Disabled [Enabled]	Selects whether serial port B is enabled or disabled.	
Base I/O address	3F8h [2F8h] 3E8h 2E8h	Selects the base I/O address for serial port B.	
Interrupt	[IRQ 3] IRQ 4	Selects the interrupt for a serial port B.	
USB 2.0 Controller	Disabled [Enabled]	Selects the USB 2.0 controller is enabled or disabled.	
Serial ATA	Disabled [Enabled]	Selects whether the serial ATA is enabled or disabled.	
SATA AHCI	[Disabled] Enabled	Displays whether AHCI (Advanced Host Controller Interface) is enabled or disabled. (View only) This option is enabled when SATA RAID is enabled.	
SATA RAID	[Disabled] Enabled	Displays the RAID configuration jumper switch is set to [RAID enable] position or not. (View only) See Chapter 4 for details.	

[]: Factory-set

IMPORTANT: To use the remote media feature of EXPRESSSCOPE Engine 2, select "Enabled" for [USB 2.0 Controller].

Advanced Chipset Control

Option	Parameter	Description	Your Setting
Multimedia Timer	Disabled [Enabled]	Specify whether the system supports the multimedia timer feature.	
Intel(R) I/OAT	Disabled [Enabled]	Enables or disables the Intel(R) Acceleration technology.	
Intel(R) VT-d	Disabled [Enabled]	Specify whether the Intel(R) Virtualization Technology for Directed I/O feature is enabled or disabled. This item appears only when the processor supports this feature.	
QPI Frequency	[Auto] 4.800 GT/s 5.866 GT/s 6.400 GT/s	Specify the QPI bus speed.	
Wake On LAN/PME	Disabled [Enabled]	Specify whether the remote power-on function through a network is enabled or disabled.	
Wake On Ring	[Disabled] Enabled	Specify whether the remote power-on function through a serial port (modem) is enabled or disabled.	
Wake On RTC Alarm	[Disabled] Enabled	Specify whether the remote power-on function by using RTC alarm feature is enabled or disabled.	

[]: Factory-set

IMPORTANT: If the power is turned off while the Wake On Ring feature is enabled, this feature is disabled at the next system boot after power-on. You need to press the Power switch to boot the system. If the power is turned off, Wake On Ring feature on power management chip is disabled until the next power-on.

Security

Press **Enter** on "Set Supervisor Password" or "Set User Password," to display the password entry screen.

Enter the passwords on the dialog box.

IMPORTANT:

- User password can be set only when Supervisor password is already set.
 - Set the passwords only after OS is installed.
 - If you forget the passwords, contact your service representative.
-

Option	Parameter	Description	Your Setting
User Password Is	Clear Set	Indicates the user password setting status.	
Supervisor Password Is	Clear Set	Indicates the supervisor password setting status.	
Set User Password	Up to eight alphanumerics	Press Enter to display the user password entry screen. For this password, accessing to the SETUP menu is restricted. This setting can be done only on login with the password input of "Supervisor" at start of SETUP.	
Set Supervisor Password	Up to eight alphanumerics	Press Enter to display the supervisor password entry screen. This password enables all the SETUP menus to be accessed. This setting can be done only on login with the password input of "Supervisor" at start of SETUP.	
Password on boot	[Disabled] Enabled	Specify whether the passwords are entered or not on booting. At first, the supervisor password must be set. If the supervisor password is set and this option is disabled, BIOS determines that a user is booting.	
Fixed disk boot sector	[Normal] Write Protect	Specify whether to permit writing into boot sector of the IDE hard disk drive or not. The server does not support IDE hard disk drive.	

[]: Factory-set

Option	Parameter	Description	Your Setting
Power Switch Inhibit	[Disabled] Enabled	Specify whether to enable or disable the power switch feature. (Forced shutdown (pressing the POWER switch for at least four seconds) feature is always acceptable to the server.	
Disable USB Ports	[Disabled] Front Rear Internal Front + Rear Front + Internal Rear + Internal Front + Rear + Internal	Select the USB port to be disabled or enabled.	

[]: Factory-set

Security Chip Configuration Submenu

Option	Parameter	Description	Your Setting
TPM Support	[Disabled] Enabled	Disables or enables TPM feature. This option is selectable only when the supervisor password is set.	
Current TPM State	–	Displays the current TPM state. This option is displayed only when "TPM Support" is set to "Enabled".	
Change TPM State	[No Change] Enable & Activate Deactivate & Disable Clear	Changes TPM state. This option is displayed and selectable only when "TPM Support" is set to "Enabled".	

[]: Factory-set

IMPORTANT: If you select any parameter except for [No Change] to change TPM State, a confirmation screen as shown below appears at the end of POST after restarting the system. Select [Execute] on the confirmation screen to determine the change you have made.

When [Enable & Activate] is selected:

Physical Presence operations

TPM configuration change was requested to
State: Enable & Activate

Note:
This section will switch on the TPM

Reject
Execute

When [Deactivate & Disable] is selected:

Physical Presence operations

TPM configuration change was requested to
State: Deactivate & Disable

Note:
This action will switch off the TPM

WARNING!!!

Doing so might prevent security applications
that rely on the TPM from functioning
as expected

Reject
Execute

When [Clear] is selected:

Physical Presence operations

TPM configuration change was requested to
State: Clear

WARNING!!!

Clearing erases information stored on the TPM.
You will lose all created keys and access to
data encrypted by these keys.

Reject
Execute

Server

Option	Parameter	Description	Your Setting
Assert NMI on PERR	Disabled [Enabled]	Specify whether to support PCI PERR or not.	
Assert NMI on SERR	Disabled [Enabled]	Specify whether to support PCI SERR or not.	
FRB-2 Policy	Disable FRB2 Timer [Retry 3 Times] Always Reset	Specify whether the processor is disabled or not when FRB level 2 error occurred in BSP.	
Boot Monitoring	[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	Specify whether to enable or disable the boot monitoring function on booting, or select the time limit for timeout. To use this function, install NEC ESMPRO Agent. Set this item to "Disabled" if the system is booted from OS without installation of NEC ESMPRO Agent.	
Boot Monitoring Policy	[Retry 3 Times] Always Reset	Specify the processing at the occurrence of timeout during boot monitoring. If [Retry 3 times] is selected, the system is reset after the occurrence of timeout and OS boot is retried up to three times. If [Always Reset] is selected, the system is reset after the occurrence of timeout and OS boot is retried repeatedly. * If no service partition exists in the system, OS boot is retried repeatedly from the system partition.	
Thermal Sensor	Disabled [Enabled]	Specify whether to enable or disable the thermal sensor monitoring function. If a thermal error is detected with this item being set to "Enabled", the system stops at the end of POST.	
BMC IRQ	Disabled [IRQ 11]	Specify whether to assign IRQ for BMC.	
Post Error Pause	Disabled [Enabled]	Specify whether to stop the POST once at the end of POST if an error occurs during the POST.	
AC-LINK	Stay Off [Last State] Power On	Specify the state of power when the AC power to the server is turn off once and then on.	

[]: Factory-set

Option	Parameter	Description	Your Setting
Power ON Delay Time (Sec)	[20] - 255	Specify the power on delay time within the range between 20 and 255 seconds. The specified time is valid when "Power On" or "Last State" is specified for AC LINK.	
Platform Event Filtering	Disabled [Enabled]	Specify whether to enable or disable the platform event filtering (PEF) feature.	

[]: Factory-set

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

The table below shows the operation when the AC power to the server is turn off once and then on again, depending on the setting of "AC LINK."

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

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

System Management Submenu

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

[]: Factory-set

Console Redirection Submenu

Option	Parameter	Description	Your Setting
BIOS Redirection Port	[Disabled] Serial Port A Serial Port B	Enables or disables direct connection from the management PC that uses NEC ESMPRO Manager or hyper terminal through the port specified here.	
Baud Rate	9600 [19.2K] 38.4K 57.6K 115.2K	Specify the baud rate used for the interface with the remote console connected.	
Flow Control	None Xon/Xoff [CTS/RTS] CTS/RTS+CD	Specify the flow control method.	
Terminal Type	PC ANSI [VT100+] VT-UTF8	Specify the type of remote console.	
Continue Redirection after POST	Disabled [Enabled]	Specify whether to continue console redirection feature after completion of POST.	
Remote Console Reset	[Disabled] Enabled	Specify whether to enable or disable resetting by Escape command (Esc R) sent from the remote console. If the server is connected with the management PC that uses NEC ESMPRO Manager, this option is always enabled even if "Disabled" is specified here.	

[]: Factory-set

BMC LAN Configuration Submenu

Option	Parameter	Description	Your Setting
Shared BMC LAN	[Disabled] Enabled	Set to "Disabled" if the management LAN port is used for management LAN. Change to "Enabled" to use the LAN port 2 for management LAN. If set to "Enabled", the management LAN port becomes unavailable.	
LAN Connection Type	[Auto Negotiation] 100Mbps Full Duplex 100Mbps Half Duplex 10Mbps Full Duplex 10Mbps Half Duplex	Specify the connection type for management LAN port.	
IP Address	[192.168.001.001]	Specify an IP address for management LAN.	
Subnet Mask	[255.255.255.000]	Specify a subnet mask for management LAN.	
Default Gateway	[000.000.000.000]	Specify a default gateway for management LAN.	
DHCP	[Disabled] Enabled	Set to [Enabled] to obtain an IP address from DHCP server automatically. If you intend to specify an IP address manually, set to [Disabled].	
Web Interface	–	–	
HTTP	[Disabled] Enabled	Set to [Enabled] to use HTTP communication for Web interface.	
HTTP Port Number	[80]	Specify the TCP port number which the management LAN uses for HTTP communication.	
HTTPS	[Disabled] Enabled	Set to [Enabled] to use HTTPS communication for Web interface.	
HTTPS Port Number	[443]	Specify the TCP port number which the management LAN uses for HTTPS communication.	
Command Line Interface	–	–	
Telnet	[Disabled] Enabled	Set to [Enabled] to use Telnet communication as a command line interface.	
Telnet Port Number	[23]	Specify the TCP port number to be used for Telnet communication.	
SSH	[Disabled] Enabled	Set to [Enabled] to use SSH communication as a command line interface.	
SSH Port Number	[22]	Specify the TCP port number to be used for SSH communication.	
Clear BMC Configuration	[Enter]	Press Enter and select "Yes" to initialize the BMC configuration.	

[]: Factory-set

IMPORTANT: Notes on performing Clear BMC Configuration

- Executing "Load Setup Defaults" in BIOS SETUP utility does not restore the default value for settings related to management LAN of BMC. To restore the default value, you need to execute Clear BMC Configuration.
- It takes about several tens seconds until initialization completes after execution of Clear BMC Configuration.
- If you are using NEC ESMPRO Agent Extension, settings for remote management feature made in NEC ESMPRO Agent Extension is also cleared by executing Clear BMC Configuration. Before execution, be sure to make backup copy of setting information for remote management features by using NEC ESMPRO Agent Extension or "System Management" in the Tool menu of NEC EXPRESSBUILDER.

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

Event Log Configuration Submenu

Option	Parameter	Description	Your Setting
Auto Clear Event Logs	[Disabled] Enabled	If set to "Enabled", logs are automatically cleared when the error log area is fulfilled.	
Clear All Event Logs	Enter	Press Enter and select "Yes" to clear the system event log.	

[]: Factory-set

System Event Log Submenu

If you select "System Event Log" on the "Event Log Configuration" of Server menu, the System Event Log submenu appears.

Use **↑**, **↓**, **+**, **-**, **Home**, or **End** to view the newer or older system event logs recorded.

NOTE: If a lot of event logs are recorded in the system, it takes about two minutes at the longest until they are displayed on the screen.

Boot

If you move the cursor to the position of "Boot," the Boot menu appears, which is used to set the boot priority.

Indication	Device
USB CDROM	USB CD-ROM drive
IDE CD	ATAPI CD-ROM (including factory-installed optical disk drive)
USB FDC	USB floppy disk drive
USB KEY	USB flash memory device
IDE HDD	IDE hard disk drives
USB HDD	USB hard disk drives
PCI SCSI	Internal hard disk drives installed in your system ("Software RAID" is displayed in the RAID configuration.)
PCI BEV	IBA GE Slot xxxx Onboard LAN. LAN1: Slot 0100, LAN2: Slot 2200 Other indication Optional PCI board connected to the riser card.

- When BIOS detects a bootable device, it displays the information on the device in the relevant indication.

To boot the server from a desired device, the device must be registered as a boot device. (Up to eight boot devices can be registered.)
- Pressing **X** after selecting a device allows the selected device to be registered as a boot device or deleted from the registration.

With eight boot devices being registered, any other device cannot be registered as a boot device even if you press **X**. To register a device as a boot device newly, first delete the registration of a device registered as a boot device but not booted any more.
- You can change the boot priority (first to eighth) of each device by using **↑**, **↓**, **+** and/or **-**.

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

Exit

The options on the menu are described below.

Exit Saving Changes

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

Exit Discarding Changes

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

Load Setup Defaults

Load default values for all BIOS SETUP items.

Load Custom Defaults

Load custom defaults for BIOS SETUP options.

Save Custom Defaults

Saves the current values as custom defaults. The “Load Custom Defaults” menu appears on the screen after saving the custom default values.

Discard Changes

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

Save Changes

Write all BIOS SETUP item values to CMOS.

RAID SYSTEM CONFIGURATION

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

About the optional RAID Controller (N8103-129/130/134/135), refer to the documents provided with optional RAID Controller.

IMPORTANT: When using Onboard RAID Controller (LSI Embedded MegaRAID™) or Optional RAID Controller (N8103-129/130/134/135), do not let the system enter hibernation or standby mode.

RAID

Overview of RAID System

What is RAID (Redundant Array of Inexpensive Disks)?

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

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

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

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

RAID Levels

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

- 3.5-inch disk model

RAID level	Number of required HDDs	
	Min.	Max.
RAID 0	1	4
RAID 1	2	2 (or 4 when configuring 2 sets of RAID 1 disk groups)
RAID 10	4	4

- 2.5-inch disk model

RAID level	Number of required HDDs	
	Min.	Max.
RAID 0	1	6
RAID 1	2	2 (or 6 when configuring 3 sets of RAID 1 disk groups)
RAID 10	4	4

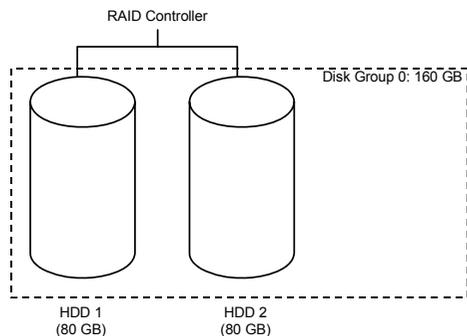
NOTES:

- For details of the RAID levels, see "RAID Levels" described later in this chapter.
 - If five or six hard disk drives are installed in 2.5-inch hard disk drive model, only four of them will be shown on POST or BIOS SETUP menu. Use the RAID utility to know the actual number of hard disk drives installed.
-

Disk Group

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

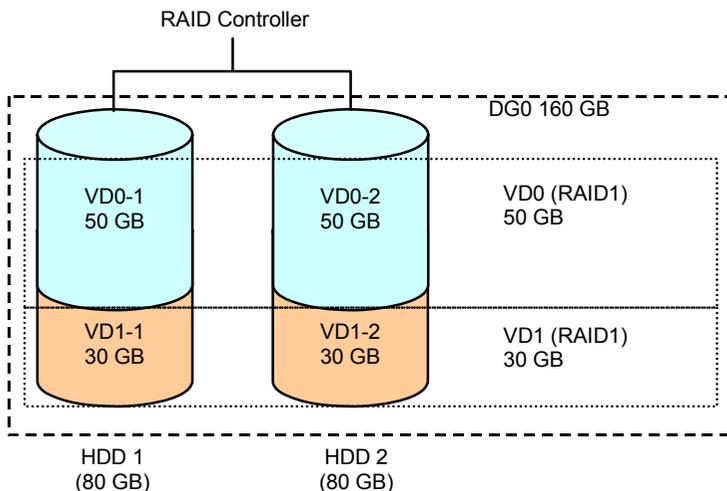
The figure below shows a sample configuration. The two HDDs are connected to the Onboard RAID Controller (LSI Embedded MegaRAID™), creating one disk group (DG).



Virtual Disk

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

The figure below shows a sample configuration in which the Onboard RAID Controller (LSI Embedded MegaRAID™) is connected with two HDDs, creating one Disk Group. Two RAID1 virtual disks (VD) are defined in the Disk Group.



Parity

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

The created redundant data is used for data recovery when a HDD is defected.

Hot-Swap

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

Hot-Spare

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

RAID Levels

The RAID levels supported by the onboard RAID Controller (LSI Embedded MegaRAID™) are described in detail below.

The onboard RAID Controller (LSI Embedded MegaRAID™) supports RAID levels 0, 1 and 10.

Characteristics of RAID Levels

The table below lists the characteristics of the RAID levels.

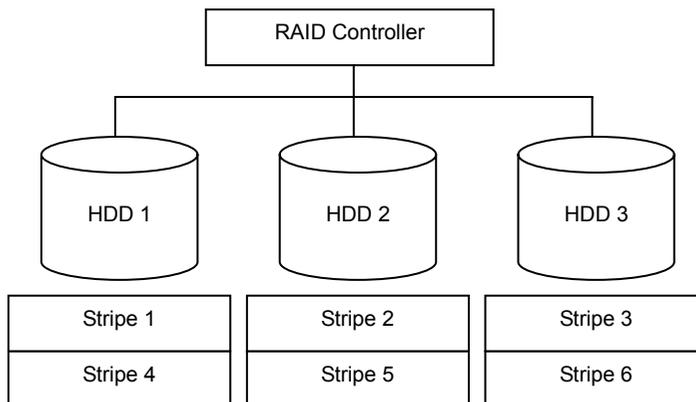
Level	Function	Redundancy	Characteristics
RAID0	Striping	No	<ul style="list-style-type: none"> • Data read/write at the highest rate • Largest capacity • Capacity: (capacity of single HDD) × (number of HDDs)
RAID1	Mirroring	Yes	<ul style="list-style-type: none"> • Two HDDs required • Capacity: capacity of single HDD
RAID10	Striping of RAID1	Yes	<ul style="list-style-type: none"> • Four or more HDDs required • Capacity: (capacity of single HDD) × (number of HDDs/2)

RAID0

In RAID0, data to be recorded is distributed to HDDs. The mode is called "striping".

In the figure below, data is recorded in stripe 1 (HDD 1), stripe 2 (HDD 2), and stripe 3 (HDD 3)... in the order. Because RAID0 allows all HDDs to be accessed collectively, it can provide the best disk access performance.

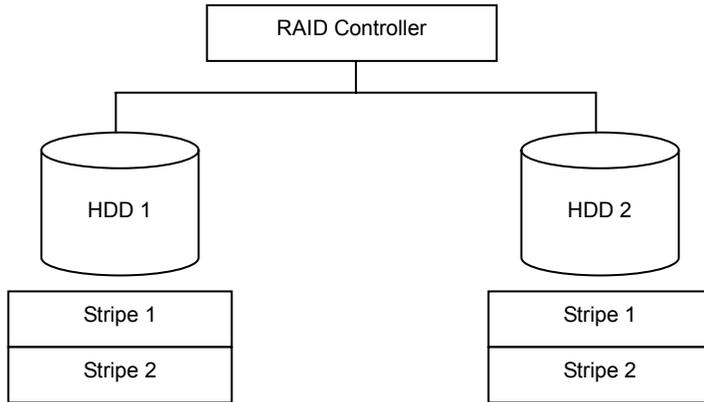
IMPORTANT: RAID0 cannot have data redundancy. If a HDD is defected, the data saved in the HDD cannot be recovered.



RAID1

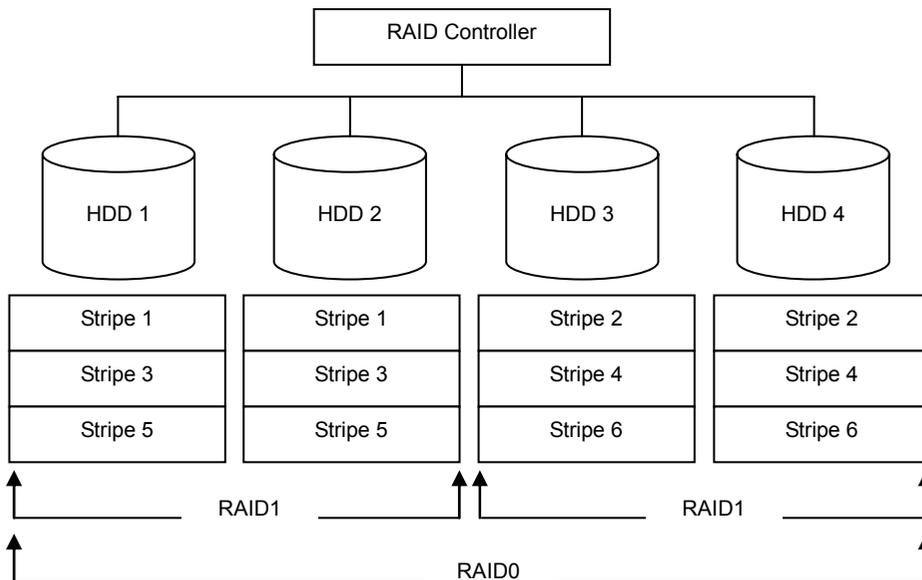
In the RAID1 level, data saved in a HDD is written to another HDD without change. The mode is called "mirroring".

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



RAID10

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



1. See the section "Preparing for Installation and Removal" as described in Chapter 9 of this guide to prepare.
2. Remove the server from the rack (see Chapter 7).
3. Remove the top cover (see Chapter 7).
4. Remove the riser card (see Chapter 7).
5. Locate the position of the RAID configuration jumper switch on the mother board.
6. Change jumper switch setting.

Setting RAID configuration jumper switch allows internal hard disk drives to be recognized as RAID drives. Set the jumper switch as shown in the below.

- Jumper pin on mother board (SATA_RAID)

SW-RAID configuration jumper switch



Enable (1-2)

- Backplane board

Controller configuration jumper switch



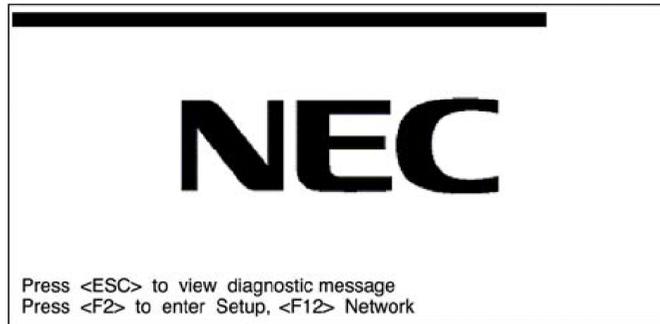
Mother board (1-2)

Use LSI Software RAID Configuration Utility to configure the RAID System. See Chapter 4 for details.

7. Install the components you have removed in earlier steps.

Running LSI Software RAID Configuration Utility

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

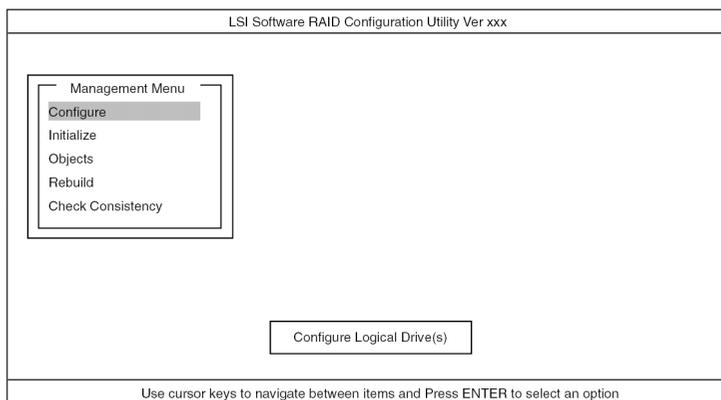


2. Check the description as shown below on the POST screen, then press **Ctrl + M**.

Press <Ctrl><M> or Enter to Run LSI Software Configuration Utility

LSI Software RAID Configuration Utility starts.

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



LSI Software RAID Configuration Utility TOP Menu (Management Menu)

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

When a confirmation message appears, select [Yes].

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

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

The server is rebooted.

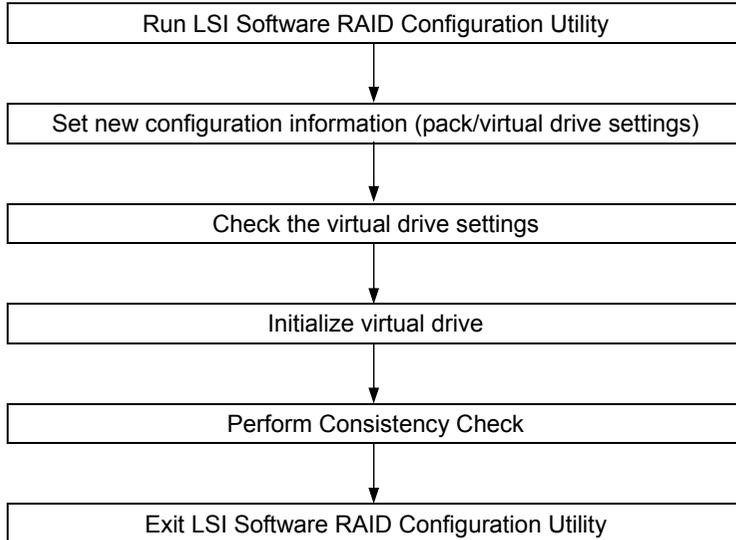
Menu Tree

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

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

Operating Procedures for Configuration Utility

Creating/Adding Configuration



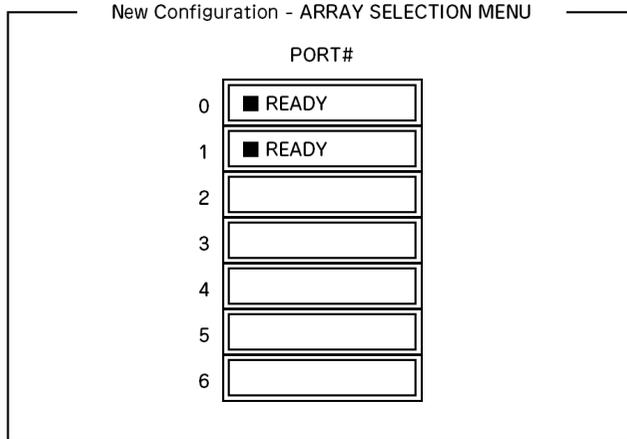
1. Run LSI Software RAID Configuration Utility.
2. Select "Configure" → "New Configuration" from the TOP menu (Management Menu).
Select "View/add Configuration" to add configuration.

IMPORTANT:

- Creating a configuration using "New Configuration" menu clears the existing configuration information. To add configuration information to the existing configuration, select "View/add Configuration."
 - You cannot create Striping of RAID1 or set the virtual drive capacity on "Easy Configuration" menu.
Use "New Configuration" or "View/Add Configuration" instead.
-

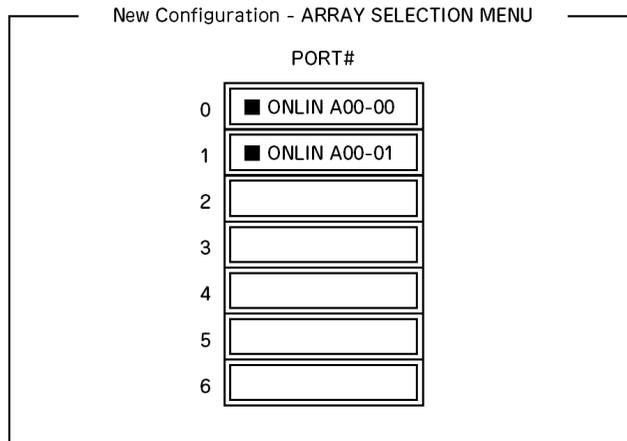
3. When a confirmation message (Proceed?) is displayed, select "Yes."

The SCAN DEVICE starts (scanning information is displayed at the bottom of the screen). Upon completion of SCAN DEVICE, the "New Configuration - ARRAY SELECTION MENU" screen appears.



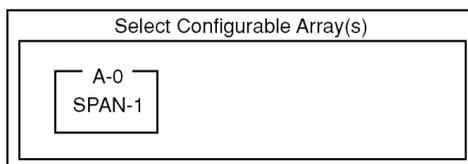
4. Move the cursor onto the hard disk drive to be packed by using cursor key and then press **Space** to select the hard disk drive.

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



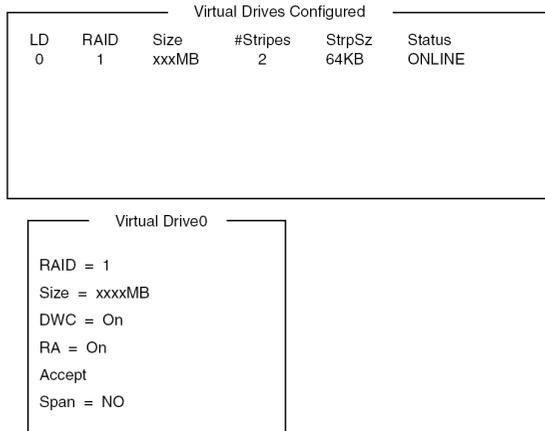
5. Press **F10** to set "Select Configurable Array(s)".
6. Press **Space**.

SPAN-1 is set.



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

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



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

(1) "RAID": Sets RAID level.

Parameter	Remarks
0	RAID0
1	RAID1
10	Striping of RAID1

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

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

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

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

Parameter	Remarks
Off	Write through
On *1	Write back

*1 Recommended setting.

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

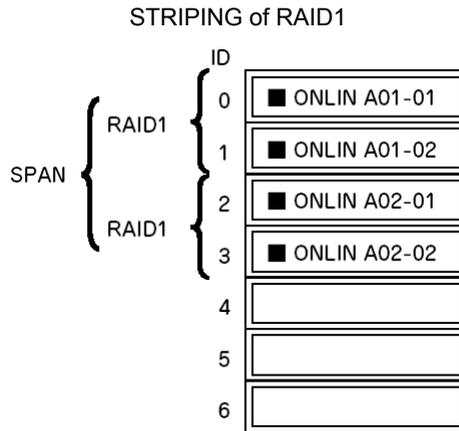
(4) "RA": Sets parameter for Read Ahead.

Parameter	Remarks
Off	Does not perform read ahead.
On	Performs read ahead. (Recommended)

(5) "Span: Sets Span.

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

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

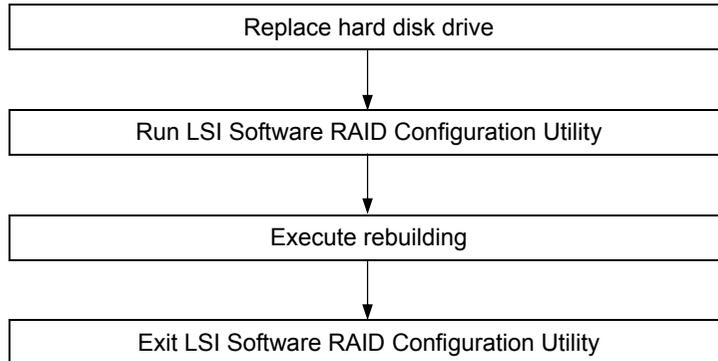


9. When all settings are completed, select "Accept" and then press **Enter** to create virtual drive.
The created virtual drive is displayed in the "Virtual Drive Configured" screen.
10. After creating virtual drive, press **Esc** to close the screen.
Go back to the "Save Configuration?" screen and then select "Yes" to save the configuration.
11. When the confirmation message shows that the configuration has been saved, press **Esc** to return to the TOP menu screen.
12. On the TOP menu screen, select "Objects" → "Virtual Drive" → "View/Update Parameters" to check virtual drive information.
13. Select "Initialize" in the TOP menu screen.
14. When the "Virtual Drives" screen appears, move the cursor to the virtual drive to be initialized, and press **Space**.
The virtual drive is selected.
15. After selecting virtual drive, press **F10** to start initialization.
A confirmation screen for execution appears. Select "Yes" to start initialization.
When the progress bar in the "Initialize Virtual Drive Progress" screen indicates 100%, initialization is completed.

- 16.** Execute Check Consistency on the virtual drive that has been initialized.
See "Check Consistency" for details.
- 17.** Press **Esc** to return to the TOP menu and exit from LSI Software RAID Configuration Utility.

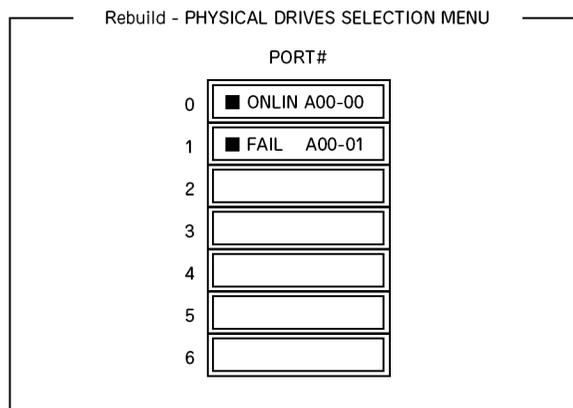
IMPORTANT: Be sure to execute Check Consistency after creating configuration.

Manual Rebuild



1. Replace a hard disk drive and turn on the server.
2. Run LSI Software RAID Configuration Utility.
3. Select "Rebuild" from the TOP menu.

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



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

The "FAIL" indication for the hard disk drive selected starts blinking.

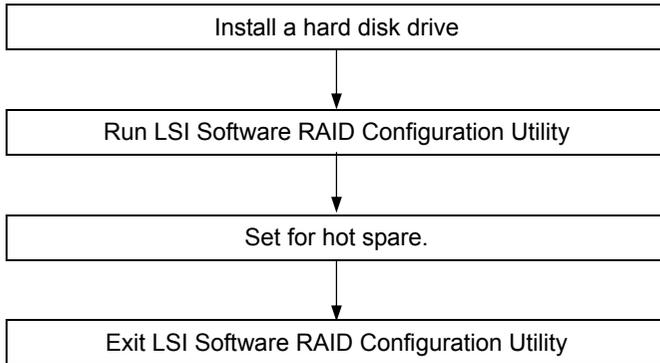
5. When hard disk drive has been selected, press **F10** to start rebuilding.
6. When confirmation screen for execution appears. Select "Yes".

The rebuild process starts.

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

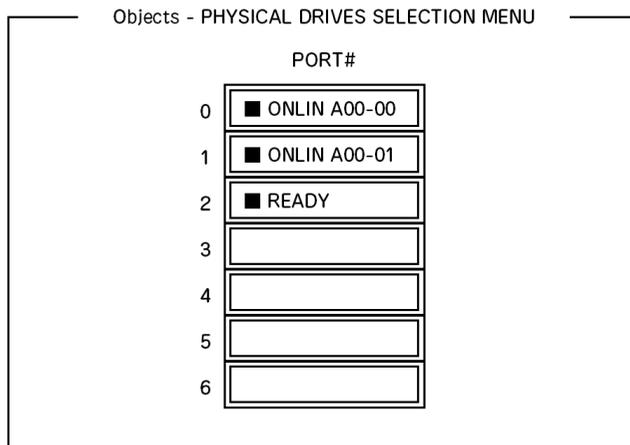
7. Press **Esc** to return to the TOP menu and exit LSI Software RAID Configuration Utility.

Setting Hot Spare



1. Install a hard disk drive to be used as hot spare, and then turn on the server.
2. Run LSI Software RAID Configuration Utility.
3. Select "Objects" → "Physical Drive" from the TOP menu.

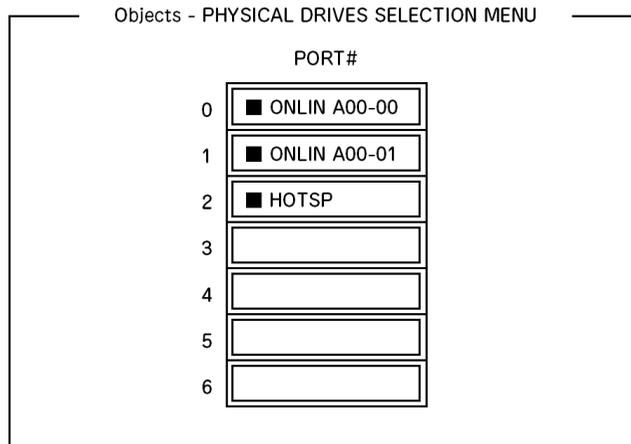
The "Objects - PHYSICAL DRIVES SELECTION MENU" screen appears.



4. Move the cursor onto the hard disk drive to be used as hot spare and press **Enter**.
5. The "Port #X" screen appears. Select "Make HotSpare."
6. A confirmation screen appears. Select "Yes."

The hard disk drive indication is changed to "HOTSP."

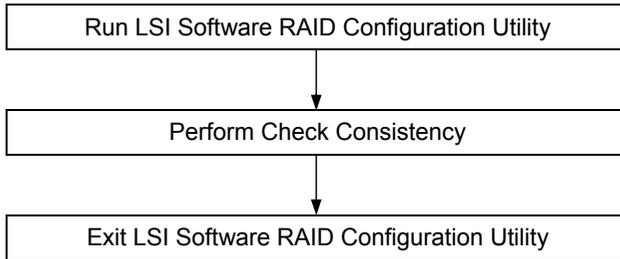
7. Press **Esc** to return to the TOP menu and exit LSI Software RAID Configuration Utility.



IMPORTANT:

- Select "Objects" → "Physical Drive" → "Port #X" → "Force Offline" to cancel the hot spare setting.
 - When two or more hard disk drives (of the same capacity) are assigned as hot spare, rebuilding is performed in order starting from the one with the smaller CH number/ID number.
-

Check Consistency



1. Run LSI Software RAID Configuration Utility.
2. Select "Check Consistency" from the TOP menu.
The "Virtual Drives" screen appears.
3. Move the cursor onto the virtual drive to be checked, and press **Space** to select it.
4. When virtual drive has been selected, press **F10** to start consistency check.
5. A confirmation screen for execution appears. Select "Yes".
The consistency check starts.
When the progress bar in the "Check Consistency Progress" screen indicates 100%, the consistency check is completed.
6. Press **Esc** to return to the TOP menu and exit LSI Software RAID Configuration Utility.

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

Others

- Clear Configuration

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

NOTES:

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

- Force Online

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

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

- Rebuild Rate

Sets the Rebuild Rate.

Select "Objects" → "Adapter" → "Sel. Adapter" → "Rebuild Rate" from the TOP menu. Available value is between 0% and 100%. Default value (recommended) is 30%.

- Hard disk drive information

Checks hard disk drive information.

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

LSI Software RAID Configuration Utility and Universal RAID Utility

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

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

Terms

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

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

Number and ID

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

Adapter and RAID Controller

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

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

Logical Drive

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

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

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

Disk Array

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

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

Physical Drive and Physical Device

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

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

Setting of Priority

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

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

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

The setting level of Universal RAID Utility and the setting value

Item	Setting level of Universal RAID Utility	Setting value
Rebuild Priority Rebuild Rate (LSI Software RAID Configuration Utility)	High	20
	Middle	10
	Low	5
Consistency Check Priority Chk Const Rate (LSI Software RAID Configuration Utility)	High	20
	Middle	10
	Low	5

NOTES:

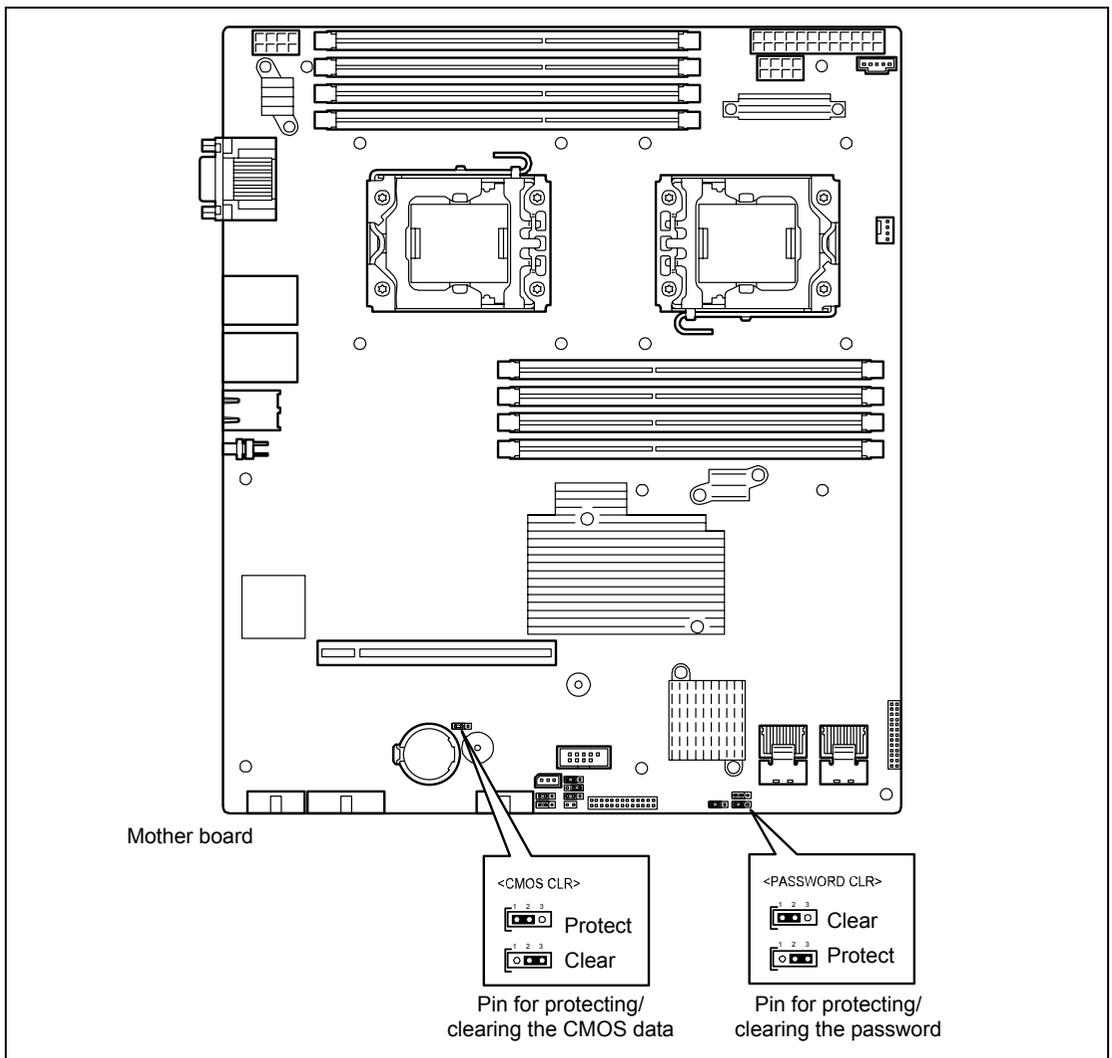
- LSI Software RAID Configuration Utility can set FGI Rate (Foreground Initialize) and BGI Rate (Background Initialize Priority). But Universal RAID Utility can't set it.
 - Universal RAID Utility can set Initialization Priority, but it can't set it to the LSI Embedded MegaRAID™. Therefore, Universal RAID Utility doesn't display [Initialization Priority] in the property of RAID Controller. Also, it will fail that you change the Initialization Priority by raidcmd.
-

CONFIGURING MOTHER BOARD JUMPERS

With the BIOS 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.
 - Do not change any other switch settings. Any change may cause the server to fail or malfunction.
-



The following describe the clearing procedure.

 WARNING	
	<p>Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-4 to 1-12 for details.</p> <ul style="list-style-type: none">■ Do not disassemble, repair, or alter the server.■ Do not remove the lithium battery.■ Disconnect the power plug before working with the server.

 CAUTION	
	<p>Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details.</p> <ul style="list-style-type: none">■ Make sure to complete installation.■ Do not pinch your finger with mechanical components.■ Avoid installation in extreme temperature conditions.

IMPORTANT: Components inside the server are easily affected by static electricity. Handle a component 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. See "Static Precautions" in this chapter for details of the static electricity.

Clearing CMOS Data

1. See the section "Preparing for Installation and Removal" in Chapter 9 to prepare.
2. Remove the server from the rack (see Chapter 9).
3. Remove the top cover (see Chapter 9).
4. Locate the position of the jumpers on the mother board you are changing.
5. Change jumper switch setting from "Protect" to "Clear".
6. Wait for a while (about 5 seconds), and then reinstall the jumper block to the default position.
7. Reassemble the server, and press the POWER switch to turn on the server.
8. Press **F2** during POST to run the BIOS Setup utility, and execute [Load Setup Defaults] on the Exit menu.

Clearing Password

1. See the section "Preparing for Installation and Removal" in Chapter 9 to prepare.
2. Remove the server from the rack (see Chapter 9).
3. Remove the top cover (see Chapter 9).
4. Locate the position of the jumpers on the mother board you are changing.
5. Change jumper switch setting from "Protect" to "Clear".
6. Reassemble the server, and press the POWER switch to turn on the server.
7. Press **F2** during POST to run the BIOS Setup utility, set the password again, and execute [Exit Saving Changes] on the Exit menu.

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Chapter 5

Installing the Operating System with Express Setup

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

- Microsoft® Windows Server® 2008 R2 Standard
- Microsoft® Windows Server® 2008 R2 Enterprise
- Microsoft® Windows Server® 2008 Standard 64-bit (x64) Edition
- Microsoft® Windows Server® 2008 Enterprise 64-bit (x64) Edition
- Microsoft® Windows Server® 2008 Standard 32-bit (x86) Edition
- Microsoft® Windows Server® 2008 Enterprise 32-bit (x86) Edition
- Microsoft® Windows Server® 2003 R2 Standard Edition
- Microsoft® Windows Server® 2003 R2 Enterprise Edition

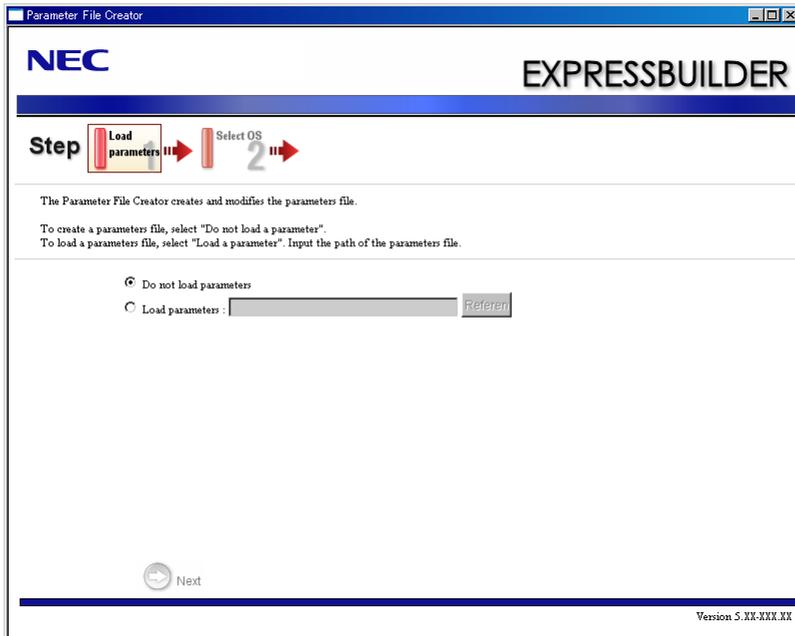
To use the server with the other operating systems described in this section, contact your service representative.

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

About Express Setup

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

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



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

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

NOTES:

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

Windows Server 2008 R2

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

IMPORTANT: The Scalable Networking Pack (SNP) function is disabled in the system that installed by Express Setup.

The setting of SNP function may affect the system performance, so please refer to the attention of SNP detail in the following site before setting it.

<http://www.nec.com/global/prod/express/>

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

Notes on Windows Installation

This section explains the notes on the Windows installation.

Confirm these notes before starting the Express Setup.

About the Windows Family

This computer supports the following Windows editions:

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

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

BIOS Settings

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

Service Pack Which NEC EXPRESSBUILDER Supports

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

- Windows Server 2008 R2
 - OS installation media (No Service Pack)

Supported Mass Storage Controllers

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

- Controllers supporting installation of OS with Express Setup
 - N8103-129 RAID Controller (256 MB, RAID0/1)*
 - N8103-130 RAID Controller (256 MB, RAID0/1/5/6)*
 - N8103-134 RAID Controller (512 MB, RAID0/1/5/6)*
 - Onboard RAID Controller (LSI Embedded MegaRAID™)
 - Other controllers
 - N8103-104A SAS Controller*
 - N8103-107 SCSI Controller*
 - N8103-135 RAID Controller (512 MB, RAID0/1/5/6)*
 - N8190-127 Fibre Channel Controller*
 - N8190-131 Fibre Channel Controller (2ch)*
 - N8190-153 Fibre Channel Controller (1ch)*
 - N8190-154 Fibre Channel Controller (2ch)*
- * Option

About the Hardware Components

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

Installing on the Mirrored Volume

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

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

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

About Removable Media

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

Connecting Hard Disk Drive

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

If you create multiple logical drives in your system, see "Re-installing the Operation System if Multiple Logical Drives Exist" (5-96).

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

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

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

Peripheral Devices such as RDX

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

About the System Partition Size

When the system is Windows Server 2008 R2

Required partition size =

size required to install OS + paging file size + dump file size + application size

Size required to install OS = 8,000MB (Full Installation)

or

= 3,500MB (Server Core Installation)

Paging file size (recommended) = Installed memory size * 1.5

Dump file size = Installed memory size + 300MB

Application size = Required size

IMPORTANT:

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

Following numbers are the recommended size.

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

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

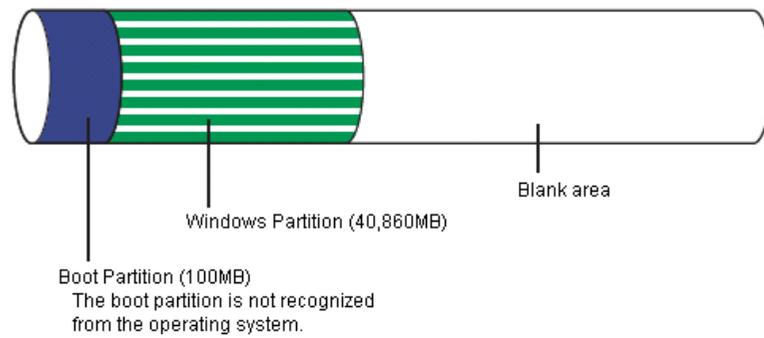
*1GB = 1,024MB

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the Windows Partition is required.
Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
 - Regardless of the size of the mounted memory, or the Write debugging information (type of memory dump), the maximum size of the dump file is 'The size of the mounted memory + 300MB'.
 - If you install any application program or the like, add necessary space to the partition to install these programs.
-

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

Example:

If you make a partition of 40,960MB (40GB), usable space will be $40,960\text{MB} - 100\text{MB} = 40,860\text{MB}$.



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

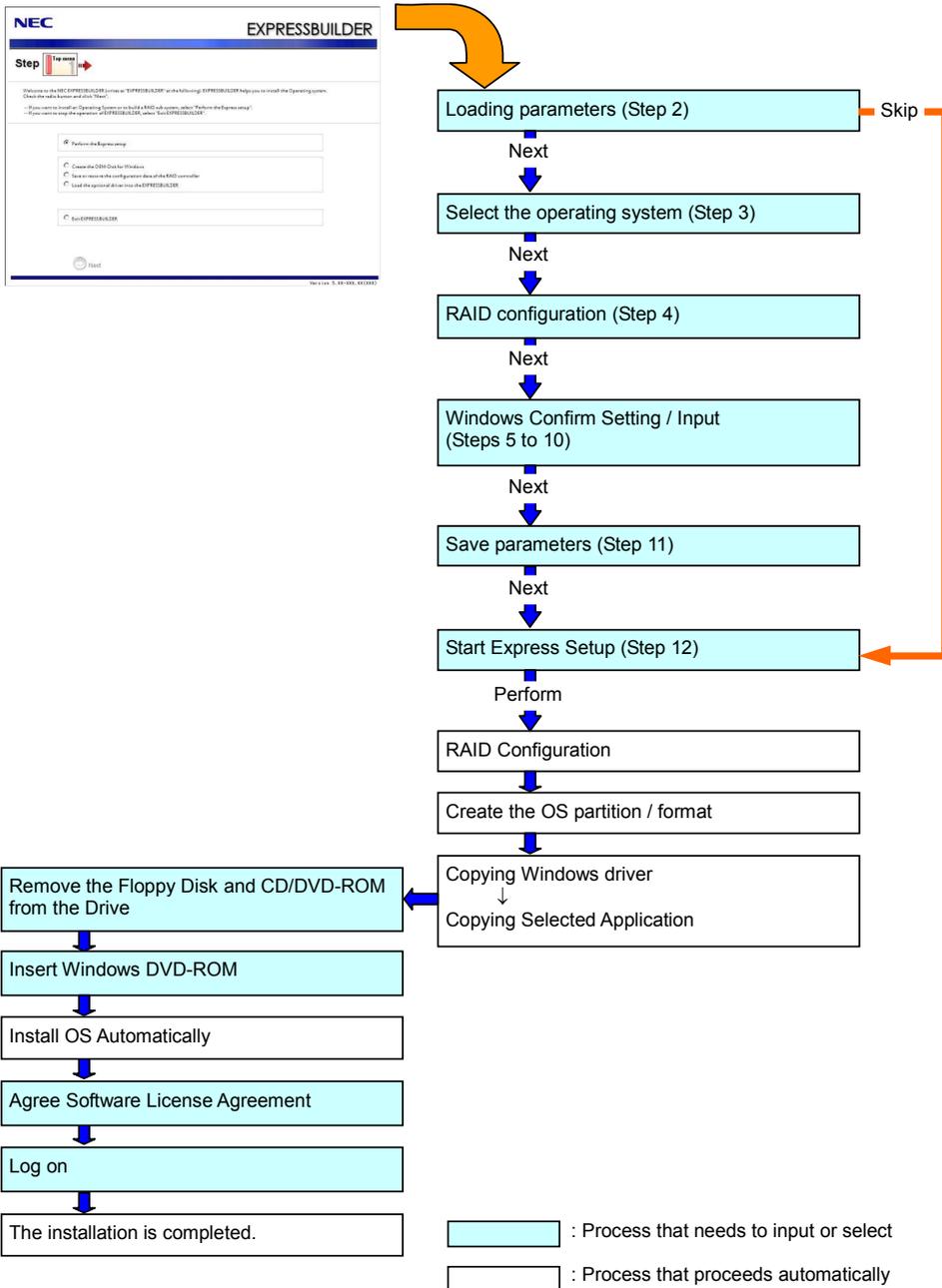
$$8,000\text{MB} + (1,024\text{MB} * 1.5) + (1,024\text{MB} + 300\text{MB}) + \text{application size} \\ = 10,860\text{MB} + \text{application size.}$$

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

1. Set the system partition size to a size sufficient to install the OS and paging file.
2. See "Setting for Solving Problems" to write the debug information of the dump file onto another disk.

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

Flow of Setup



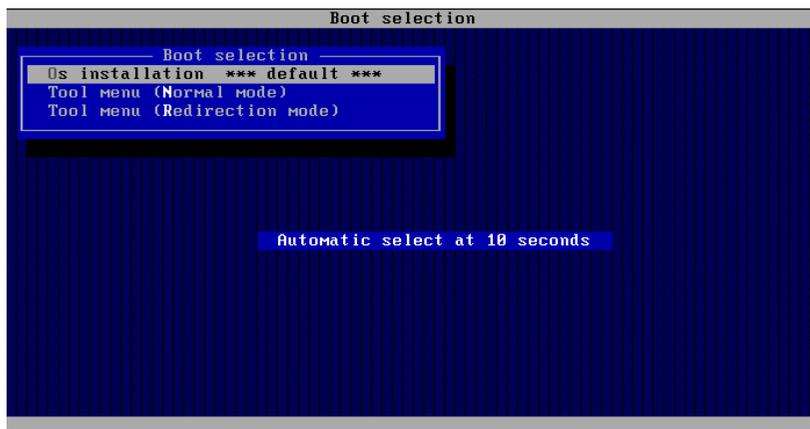
Installing the Windows Server 2008 R2

Express Setup proceeds the setup by selecting or inputting several parameters on the wizard. You can also save the parameters to a floppy disk as a parameters file.

1. Turn the power of peripheral device on, and then turn on the server.
2. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive of the server.
3. Press the RESET switch or press **Ctrl, Alt,** and **Delete** to reboot from the NEC EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)

The system will boot from the DVD and NEC EXPRESSBUILDER starts.

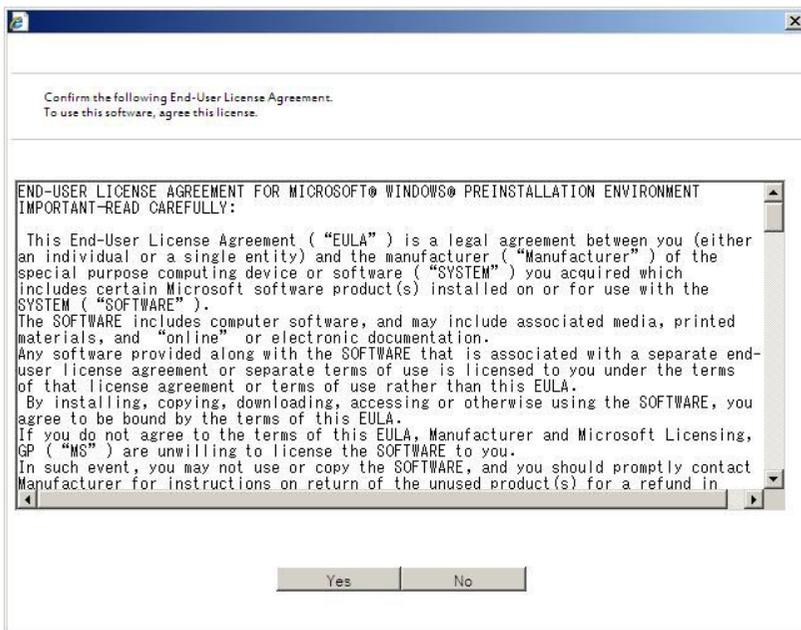
Select "Os installation *** default ***" from the Boot selection menu.
(If you do not hit any key, "Os installation" is selected automatically.)



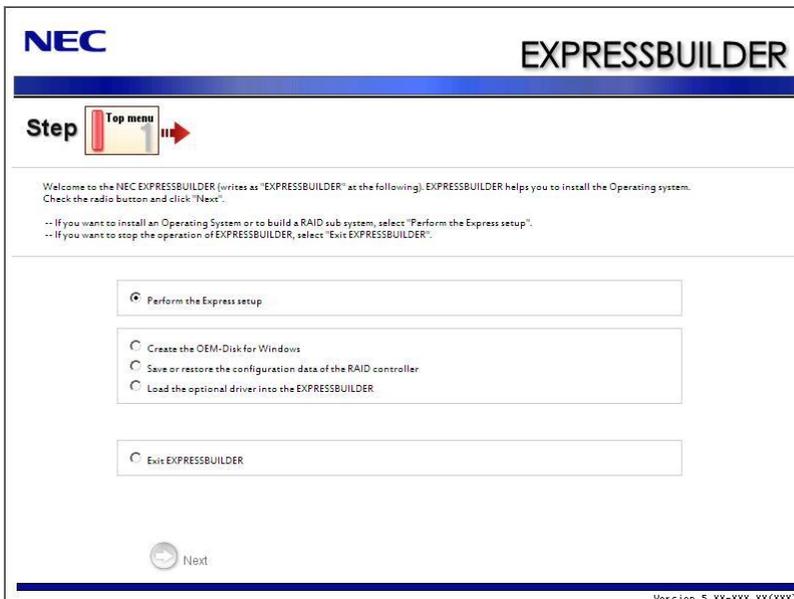
4. Select [English] from the Select Language, click [OK].



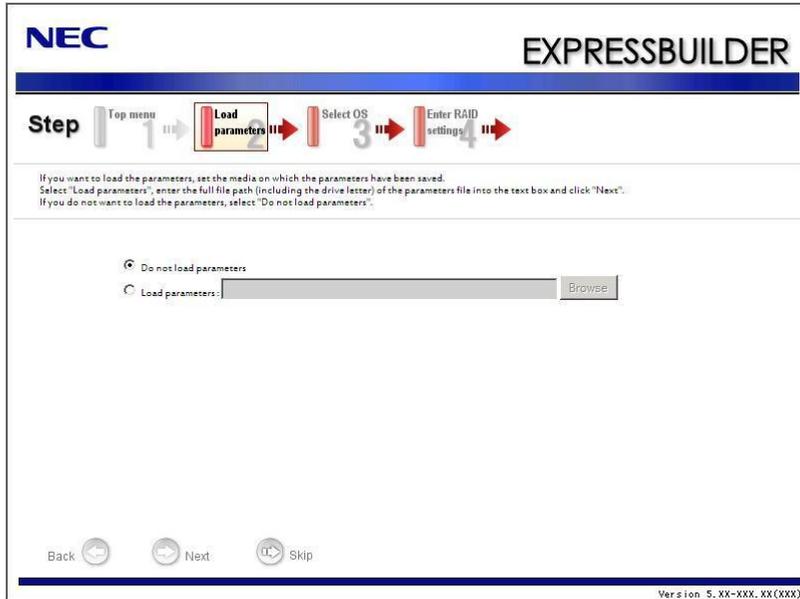
5. When the Software License Agreement screen of Windows PE appears, click [Yes].



6. Select [Perform the Express setup] from the Top Menu, click [Next].



7. [Load parameters] steps are displayed.



[Do not load parameters]

- (1) Select [Do not load parameters].
- (2) Click [Next].

IMPORTANT: The setup using a parameter file saved in the Flash FDD is not supported.

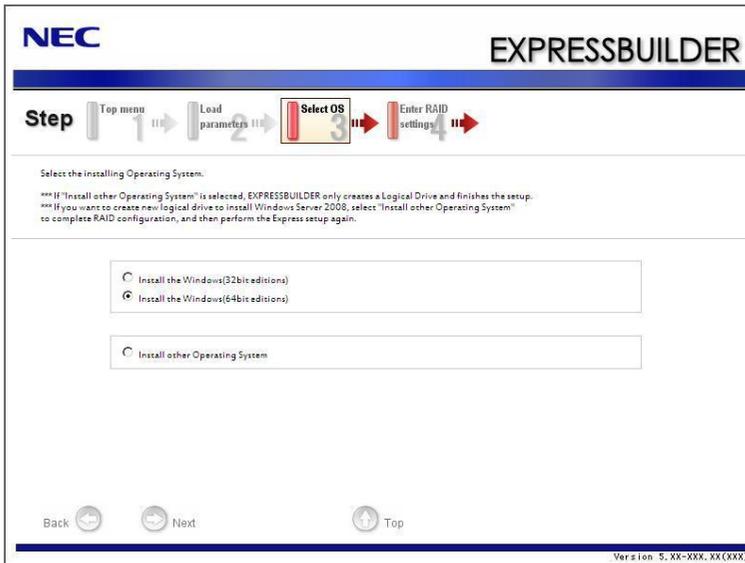
NOTE: If a floppy disk drive is not connected, select this item.

[Load parameters]

- (1) Insert the floppy disk containing the parameters file.
- (2) Select [Load parameters], enter the file path of the parameters file into the text box.
- (3) Click [Next].

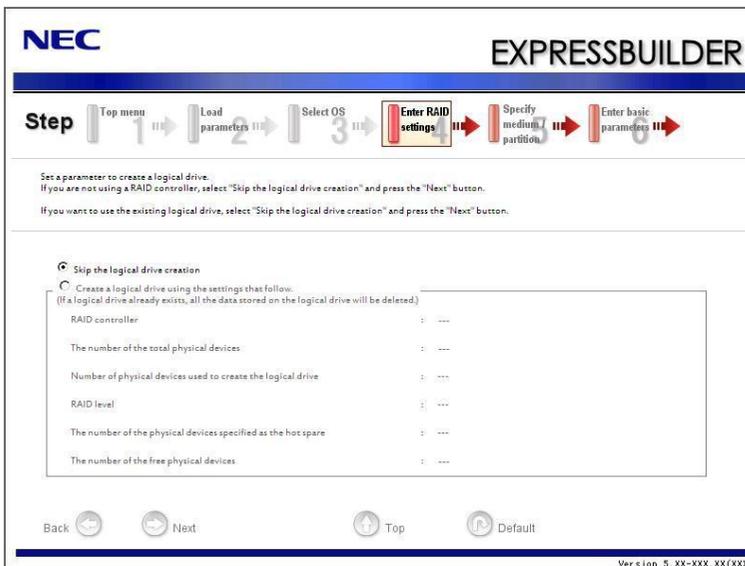
8. Select the installing Operating System.

Select [Install the Windows (64bit editions)] from the menu, click [Next].



9. Enter the setting of a logical drive.

[Enter RAID settings] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].



NOTES:

- You can use only the physical devices that have same model number to configure logical drive.
- If the process is not finished normally, the driver may not be stored in the NEC EXPRESSBUILDER. Refer to "Optional Board Supported by NEC EXPRESSBUILDER" described earlier in this chapter.

10. Specify the installing medium and the Windows system partition.

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

The screenshot shows the NEC EXPRESSBUILDER installation wizard. At the top, the NEC logo and 'EXPRESSBUILDER' are displayed. Below the title bar, a progress bar shows six steps: 1. Top menu, 2. Load parameters, 3. Select OS, 4. Enter RAID settings, 5. Specify medium / partition (highlighted in red), and 6. Enter basic parameters. Below the progress bar, the current step is described: 'Specify the installing medium and the Windows system partition.' A note below this states: 'If "Use existing partitions" is selected, EXPRESSBUILDER installs the Operating System to the 1st partition.' The main configuration area is divided into two sections. The first section, 'Medium selection', includes a dropdown for 'Windows family/edition' (set to 'Windows Server 2008 R2 Standard(Full Installation)'), a dropdown for 'Language' (set to 'English'), a checkbox for 'Install the Service Pack', a dropdown for 'Keyboard layout' (set to 'Default'), and a dropdown for 'Time zone' (set to '(GMT-08:00) Pacific Time (US & Canada)'). The second section, 'Windows system drive settings', has three radio button options: 'Use existing partitions (only the 1st partition is formatted and its data is erased)', 'Create a new partition (all of the data in the disk is erased)' (which is selected), 'Use disk space as large as possible', and 'Specify the size of the system partition' (with a text input field set to '33000 (MB)' and a range '(14,737MB - 1,907,726MB) *1GB=1,024MB'). At the bottom, there are navigation buttons: 'Back', 'Next', 'Top', and 'Default'. The version number 'Version 5.0000000000000000' is visible in the bottom right corner.

IMPORTANT:

- About partition size
 - Specify the partition size larger than required minimum size for OS installation.
 - Do not specify larger partition size than the capacity of connected hard disk drive.
 - You can not specify a logical drive larger than 2,097,144MB at RAID system.
- If you select "Create a new partition" at "Windows system drive settings", the contents of the hard disk will be all deleted.
- If "Use existing partitions" is selected, NEC EXPRESSBUILDER installs the Operating System to the Windows partition (The Boot partition (if it exists) and the Windows partition are deleted). The data in the other partition is kept if the system has two or more partitions. (See the figure below.)

Boot Partition Deleted	Windows Partition Deleted	User Data Partition Retained
------------------------------	---------------------------------	------------------------------------

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

11. Enter the user information.

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

NEC EXPRESSBUILDER

Step 1 Top menu 2 Load parameters 3 Select OS 4 Enter RAID settings 5 Enter basic parameters

Enter the basic parameters.

The computer name is less than 15 characters. (Do not use the same name as another computer name, domain name or workgroup name)
 The user name and the organization's name are less than 50 characters.
 The Administrator password is more than 6 characters and the password contains characters from three of the four categories(A-Z, a-z, 0-9, Non-alphanumeric characters (!, \$, #, _...)).

User information

Computer name : (necessary)

User name :

Administrator password : (necessary)

Confirm password : (necessary)

Back Next Top Default

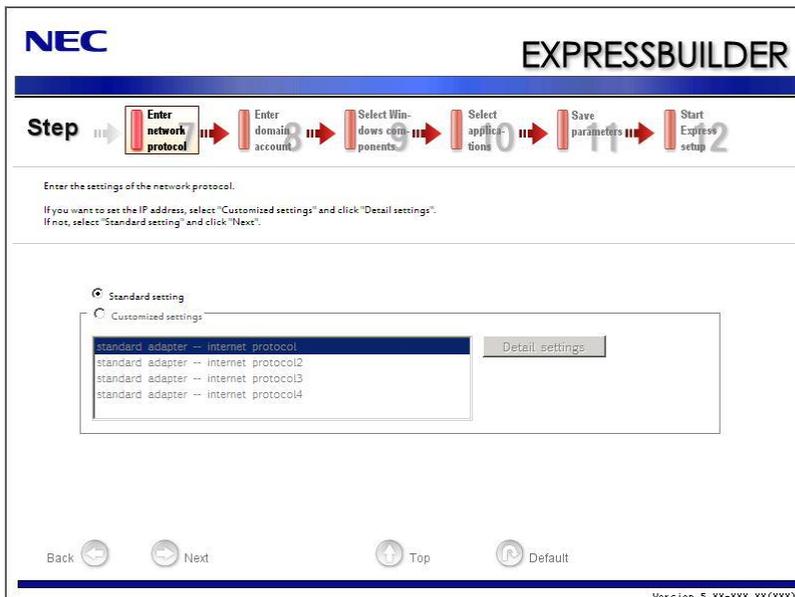
Version 5.XX-XXX.XX(XXX)

IMPORTANT: Computer name and Administrator password that satisfy the next condition, are required.

- More than 6 characters
- Contains characters from three of the following categories (numbers, uppercase letters, lowercase letters, and signs).

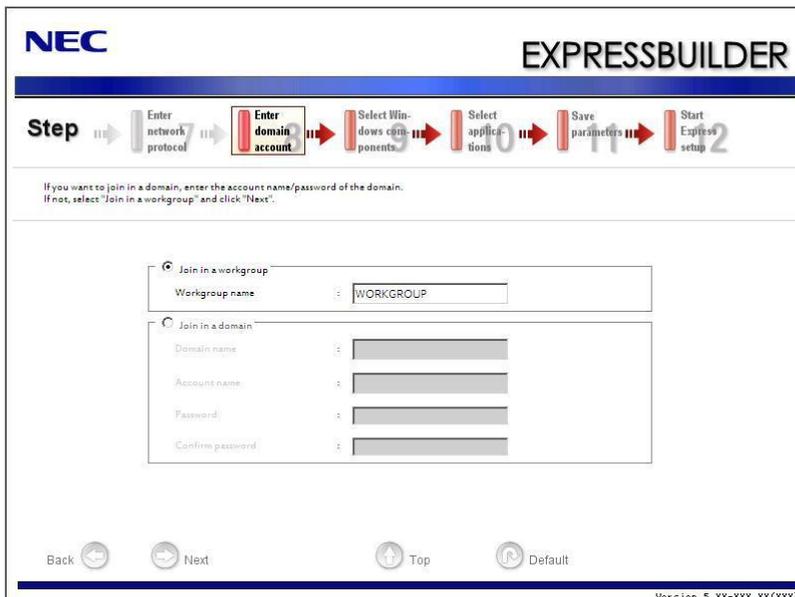
12. Enter the setting of the network protocol.

[Enter Network Protocol] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].



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

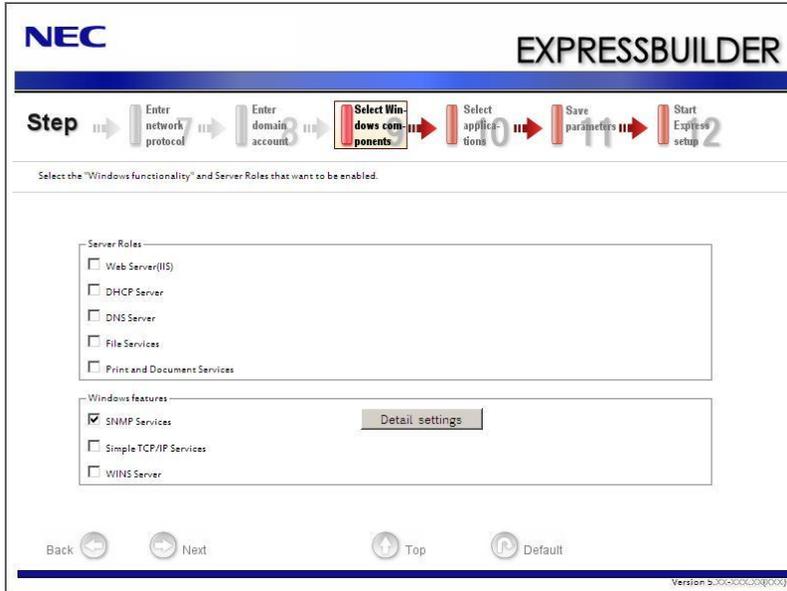
[Enter domain account] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].



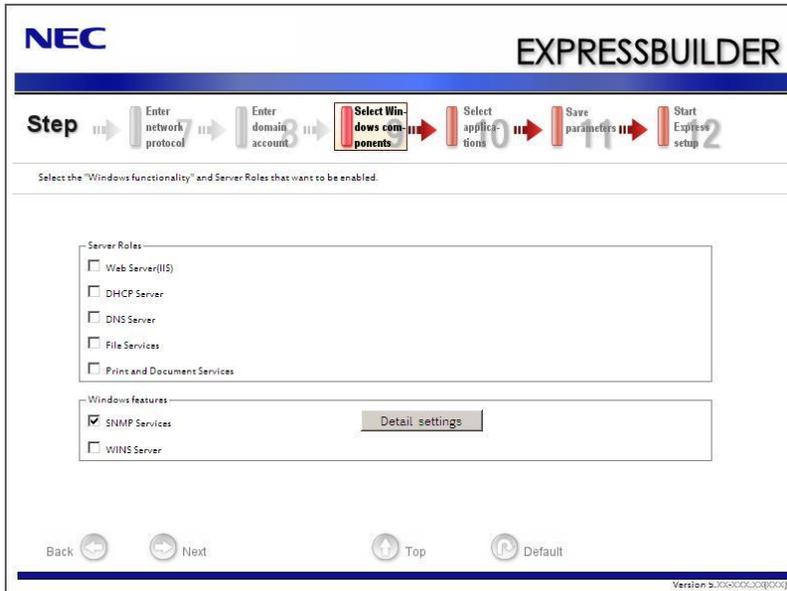
14. Select the installing components.

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

<Full Installation>

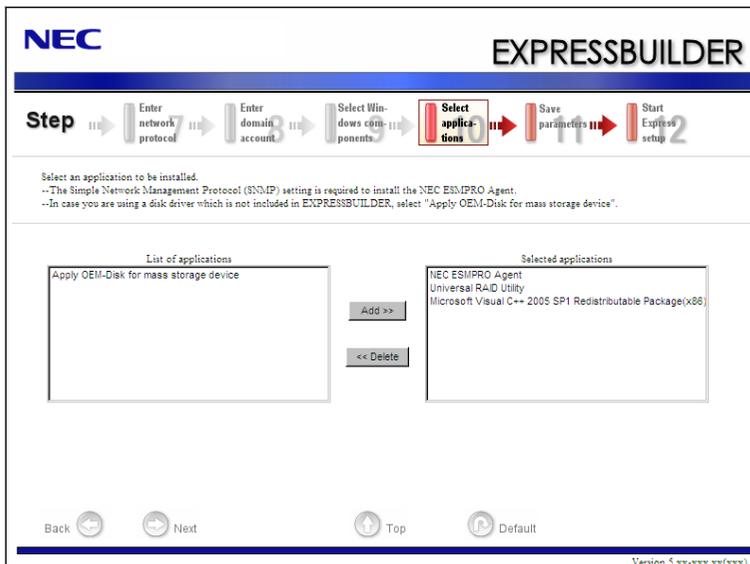


<Server Core Installation>



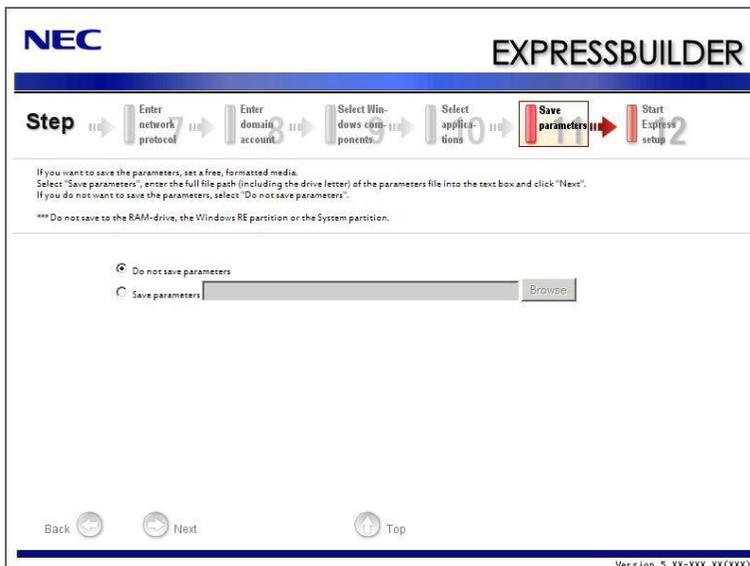
15. Select the installing applications.

[Select applications] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].



16. Save the parameters.

[Save parameters] steps are displayed.

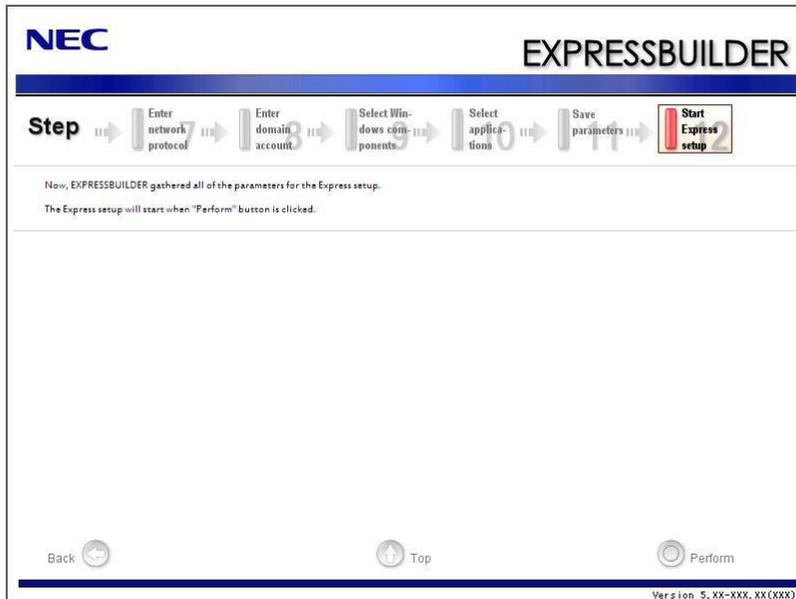


If you want to save the parameters, set the free formatted floppy disk.

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

If not, select [Do not save parameters].

17. The Express Setup will start when you click [Perform] in [Start Express setup] step.



18. Remove NEC EXPRESSBUILDER DVD from the optical disk drive according to the message.

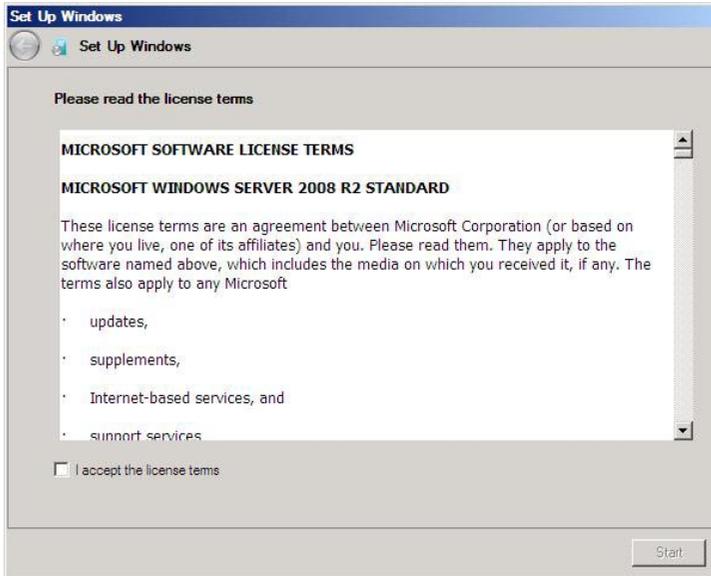
If you proceed the setup by using setup parameter file, remove the floppy disk from the floppy disk drive.

19. Insert Windows Server 2008 R2 DVD-ROM into the optical disk drive.

NOTE: Windows Server 2008 R2 and selected applications will be installed automatically and reboots several times.

20. [Agree Software License Agreement] screen appears. (Full Installation only)

Read the license terms carefully. If you agree, select I accept the license terms, and then click [Next].



21. When the following message appears, press **Ctrl + Alt + Del**.

Press CTRL + ALT + DELETE to log on

22. Log on to the system.

<Full Installation>

When the following screen appears, enter your password into "Password", and click .



<Server Core Installation>

In the following screen, enter your password into "Password", and click .



Hereinafter, proceed operations according to the message.

Now the Setup using Express Setup has completed.

After Express Setup has completed, be sure to execute the tasks described in "Installing and Setting Device Drivers".

Installing and Setting Device Drivers

Follow these steps to install and configure the device drivers.

LAN Driver and PROSet

The LAN driver and PROSet have been installed automatically while your system was being updated in the previous section.

NOTES:

- To change the LAN driver and PROSet settings, log on to the system from a local console using an administrator account. Remotely changing the settings by using the operating system's remote desktop feature is not supported.
 - [Internet Protocol (TCP/IP)] check-box is necessary checked to set an IP Addresses. According to the circumstances, the check-box is not checked from begin. Manually checked the check box and set an IP addresses.
-

LAN Driver Setting

- Link Speed
LAN drivers will be installed automatically, but the link speed and Duplex mode need to be specified manually.
 1. Open the [Device Manager]
 2. Double-click [(Network Adapter Name)] in the list.
 3. Click the [Link Speed] and specify the [Speed & Duplex] value the same as the value specified for HUB.
 4. Click [OK].
 5. Restart the system.
- WOL
Refer to the following procedure for WOL (Wake On LAN) setting.
 1. Start Device Manager.
 2. Point to [Network adapters] and double click following adapter. Open the adapter [Properties].
 - [Intel(R) 82574L Gibabit Network Connection]
 - [Intel(R) 82574L Gibabit Network Connection #2]

3. Click [Power Management] tab and change setting in [Wake On LAN] according to the following list.

Setting item	Using WOL	Not using WOL
"Wake On Magic Packet"	ON	OFF
"Wake on Magic Packet from power off state"	ON	OFF
"Wake on Link"	OFF	OFF
"Wake on Pattern Match"	OFF	OFF

NOTES:

- [Power Saver Options] setting is not necessary to change.
 - Above setting will be maintained until manually resetting are executed.
-

4. Click [OK].
5. Restart the system

IMPORTANT: The parameters of [Wake On LAN] will not exist, if the network ports are not available for WOL.

Setup Team

Adapter Fault Tolerance (AFT) is a feature that creates a group containing more than one adapter and automatically converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

Adaptive Load Balancing (ALB) is a feature that creates a group containing more than one adapter and enhances the throughput by operating packet transmission from the server by all the adapters.

This feature includes AFT feature.

Switch Fault Tolerance (SFT) is a feature that provides a failover relationship between two ports when each port is connected to a separate switch.

SFT supports two ports per team.

Static Link Aggregation (SLA) accounts for the GEC and 802.3ad static protocols.

SLA is a switch-assisted teaming mode and requires configuring ports at both ends of the link: server interfaces and switch ports.

IMPORTANT:

- AFT/ALB setup must be operated after system update and restarting the system.
 - All the adapters specified as a group of Adapter Teaming must exist on the same LAN. If they are connected to the separate switches, they will not work normally.
 - The adapters specified as a group of Adaptive Load Balancing (ALB) can be connected to only Switching Hub.
 - When exchange the mother board or option network card, make sure to remove the adapter team before exchanges and recreate the adapter team after exchange complete.
 - Please confirm the port setting of switching hub (L2) matches the server network adapter Teaming mode.
 - Teaming is not supported with Windows Server Core.
 - If you want to change the type of a teaming, be sure to remove the teaming first, then re-setup a new teaming. Do not use the function of PROSet to change the type of a teaming.
-

Create Team

1. Open the [Device Manager].
2. Open [Network adapters] → [Intel(R) xxx] properties.
3. Click [Teaming] tab and check the [Team this adapter with other adapters] check box. Click [New Team].
4. Fill the name of the team in [Specify a name for the team] and click [Next].
5. Include the adapter to the team and click [Next].
6. Select a team mode, and then click [Next].

IMPORTANT: Following team types are supported

- Adapter Fault Tolerance
 - Adaptive Load Balancing
 - Static Link Aggregation
 - Switch Fault Tolerance
-

7. Click [Finish].

IMPORTANT: Teaming an adapter with standard network adapter and optional network adapter will cause the following message appear. Click [OK] and continue the setting.

"One or more adapters in the team do not support true NDIS6.20 Receive-Side Scaling, Receive-Side Scaling will be disabled for the team, Disabling Receive-Side Scaling will negatively impact the performance of the team."

8. Click [TEAM: "Team name"] from [Device manager] → [Network adapters] to modify the team.
Click [Settings] tab and click [Modify Team] button.
9. Refer to the following procedure to set the team member adapter priority status.
 - Set Primary
Point the adapter and click [Set Primary] button.
 - Set Secondary
Point the adapter and click [Set Secondary] button.

NOTE: Adapter priority config can be confirmed by the following procedure:

1. Click [TEAM: "Team name"] from [Device manager]→[Network adapters].
 2. Click [Settings] and confirm Adapters in team list.
-
10. Click [Test Switch] → [Run test] to confirm the adapter team is properly setup.
Confirm the result in [Test results]
 11. Restart the system.

Remove Team

1. Open the [Device Manager].
2. Click [Network adapters], and open [TEAM: "Team name"] properties.
3. Click [Setting] tab.
4. Click [Remove Team] button.
5. Click [Yes] to the message.
6. Confirm [TEAM: "Team name"] adapter is not existing in [Network adapters] tree and reboot the system.

LAN Board Driver (N8104-122/125A/126)

The drivers for LAN Board Driver (N8104-122/125A/126) are automatically installed by Windows Plug-and-Play. You do not need to install them manually.

Graphics Accelerator Driver

If you use standard graphics accelerator drivers, update your system with NEC EXPRESSBUILDER DVD attached to your system.

Standard graphics accelerator drivers will be installed automatically.

Please refer to "Graphics Accelerator Driver" described in Appendix D when you want to reinstall the driver individually.

Installing SCSI Controller Driver (N8103-107)

If you use the SCSI Controller N8103-107, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing SAS Controller Driver (N8103-104A)

If you use the SAS Controller N8103-104A, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing RAID Controller Driver (N8103-135)

If you use the RAID Controller N8103-135, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing the Fibre Channel Controller Driver (N8190-127/131/153/154)

If you use the Fibre Channel Controller (N8190-127/131/153/154), you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Setting for Solving Problems

Setup your computer in advance so that it can recover from any trouble precisely and as soon as possible when it should occur.

For more information, refer to page 5-84.

BitLocker

For BitLocker, hotfix is provided by Microsoft. Before applying hotfix, please check the information written by Microsoft carefully.

For more information, please visit

<http://support.microsoft.com/kb/975496/en-us>

Windows Server 2008

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

IMPORTANT: Cautions for the Memory Dump

- The Scalable Networking Pack (SNP) function is disabled in the system that installed by Express Setup.

The setting of SNP function may affect the system performance, so please refer to the attention of SNP detail in the following site before setting it.

<http://www.nec.com/global/prod/express/>

- Refer to the public information of SNP function when KB967224 is not applied. Notes are described about KB967224.
-

NOTE: If you install Windows Server 2008 without using Express Setup, see Appendix E.

Notes on Windows Installation

This section explains the notes on the Windows installation.

Confirm these notes before starting the Express Setup.

About the Windows Family

This computer supports the following Windows editions:

- Windows Server 2008 Standard 64-bit (x64) Edition (hereinafter, referred to as "Windows Server 2008")
- Windows Server 2008 Enterprise 64-bit (x64) Edition (hereinafter, referred to as "Windows Server 2008")
- Windows Server 2008 Standard 32-bit (x86) Edition (hereinafter, referred to as "Windows Server 2008")
- Windows Server 2008 Enterprise 32-bit (x86) Edition (hereinafter, referred to as "Windows Server 2008")

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

BIOS Settings

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

Service Pack Which NEC EXPRESSBUILDER Supports

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

- Windows Server 2008
 - OS installation media (with Service Pack 2)
 - OS installation media (No Service Pack) + Service Pack 2
 - OS installation media (No Service Pack)

Supported Mass Storage Controllers

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

- Controllers supporting installation of OS with Express Setup
 - N8103-129 RAID Controller (256 MB, RAID0/1)*
 - N8103-130 RAID Controller (256 MB, RAID0/1/5/6)*
 - N8103-134 RAID Controller (512 MB, RAID0/1/5/6)*
 - Onboard RAID Controller (LSI Embedded MegaRAID™)
 - Other controllers
 - N8103-104A SAS Controller*
 - N8103-107 SCSI Controller*
 - N8103-135 RAID Controller (512 MB, RAID0/1/5/6)*
 - N8190-127 Fibre Channel Controller*
 - N8190-131 Fibre Channel Controller (2ch)*
 - N8190-153 Fibre Channel Controller (1ch)*
 - N8190-154 Fibre Channel Controller (2ch)*
- * Option

About the Hardware Components

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

Installing on the Mirrored Volume

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

If you want to install the OS on a volume that is mirrored using Disk Management, invalidate the

mirroring and reset to the basic disk before the installation, and validate the mirroring again after the installation.

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

About Removable Media

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

Connecting Hard Disk Drive

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

If you create multiple logical drives in your system, see "Re-installing the Operation System if Multiple Logical Drives Exist" (5-96).

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

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

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

Peripheral Devices such as RDX

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

About the System Partition Size

When the system is Windows Server 2008 64-bit (x64) Edition:

Required partition size =

size required to install OS + paging file size + dump file size + application size

Size required to install OS	=	11,600MB (Full Installation)
		12,300MB (Full Installation with Service Pack 2)
		16,720MB (Full Installation + Service Pack 2)
		or
	=	4,100MB (Server Core Installation)
		4,800MB (Server Core Installation with Service Pack 2)
		9,220MB (Server Core Installation + Service Pack 2)

Paging file size (recommended) = Installed memory size * 1.5

Dump file size = Installed memory size + 300MB

Application size = Required size

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
 - Regardless of the size of the mounted memory, or the Write debugging information (type of memory dump), the maximum size of the dump file is 'The size of the mounted memory + 300MB'.
 - If you install any application program or the like, add necessary space to the partition to install these programs.
-

Example:

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

$$11,600\text{MB} + (1,024\text{MB} * 1.5) + (1,024\text{MB} + 300\text{MB}) + \text{application size}$$

$$= 14,460\text{MB} + \text{application size.}$$

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

1. Set the system partition size to a size sufficient to install the OS and paging file.
2. See "Setting for Solving Problems" to write the debug information of the dump file onto another disk.

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

When the system is Windows Server 2008 32-bit (x86) Edition

Required partition size	= size required to install OS + paging file size + dump file size + application size
Size required to install OS	= 6,300MB (Full Installation) 9,300MB (Full Installation with Service Pack 2) 9,400MB (Full Installation + Service Pack 2) or = 2,200MB (Server Core Installation) 5,200MB (Server Core Installation with Service Pack 2) 5,300MB (Server Core Installation + Service Pack 2)
Paging file size (recommended)	= Installed memory size * 1.5
Dump file size	= Installed memory size + 300MB
Application size	= Required size

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
- Depending on system configuration, 4096MB or more per partition might not be able to be set to the paging file size.
Set it to 4095MB when the message to ask a value that is smaller than 4096MB is displayed.
- The maximum dump file size for the system with more than 2GB memory mounted is '2048MB + 300MB'.
- If you install any application program or the like, add necessary space to the partition to install these programs.

Example:

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

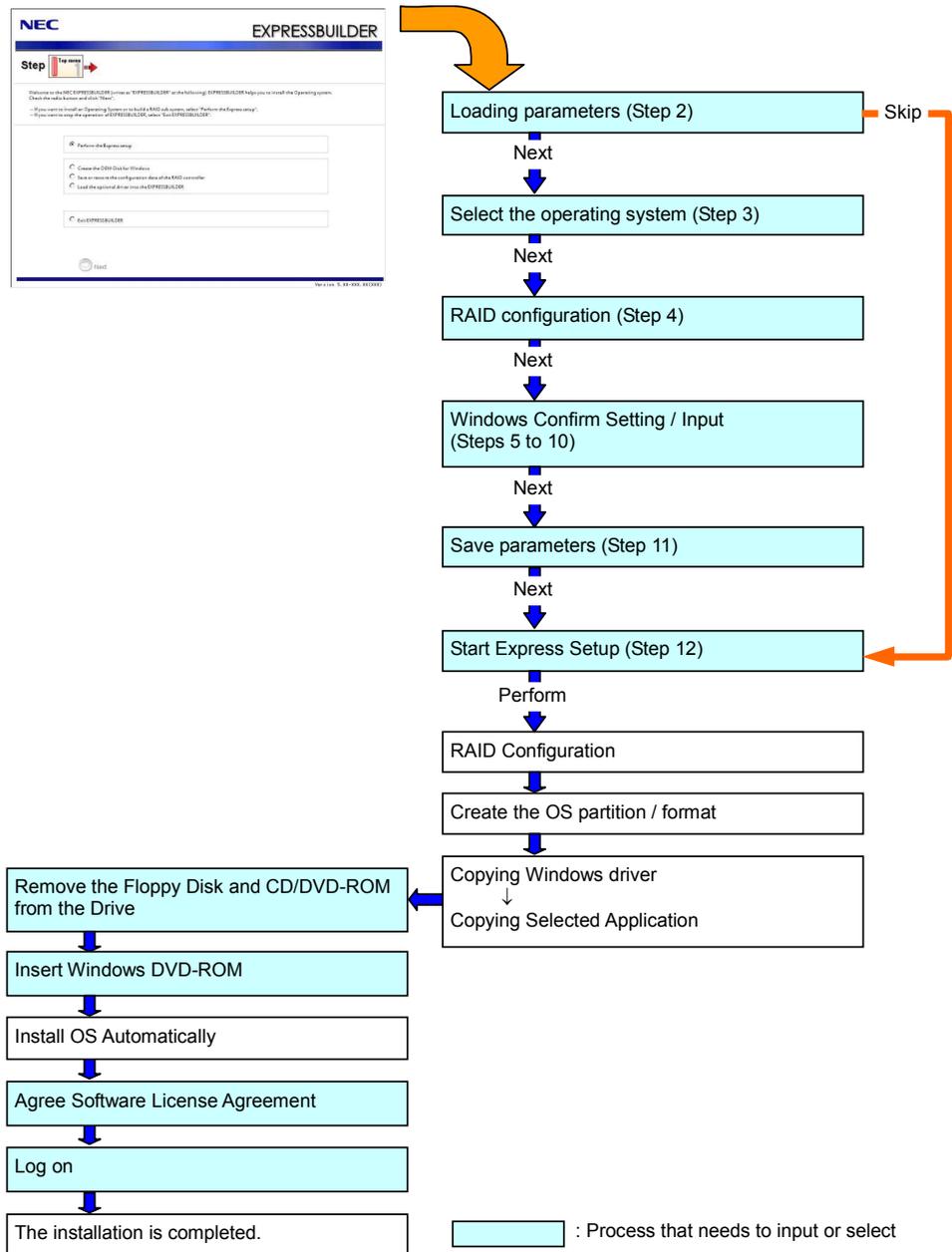
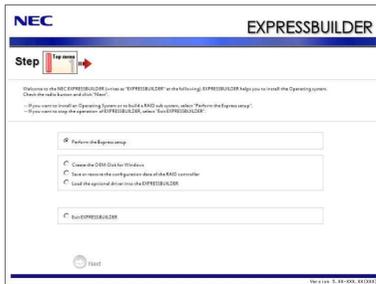
$$\begin{aligned} &6,300\text{MB} + (1,024\text{MB} * 1.5) + 1,024\text{MB} + 300\text{MB} + \text{application size} \\ &= 9,160\text{MB} + \text{application size.} \end{aligned}$$

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

1. Set the partition size to a size sufficient to install the OS and paging file.
2. See "Setting for Solving Problems" to write the debug information of the dump file on to another disk.

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

Flow of Setup



: Process that needs to input or select
 : Process that proceeds automatically

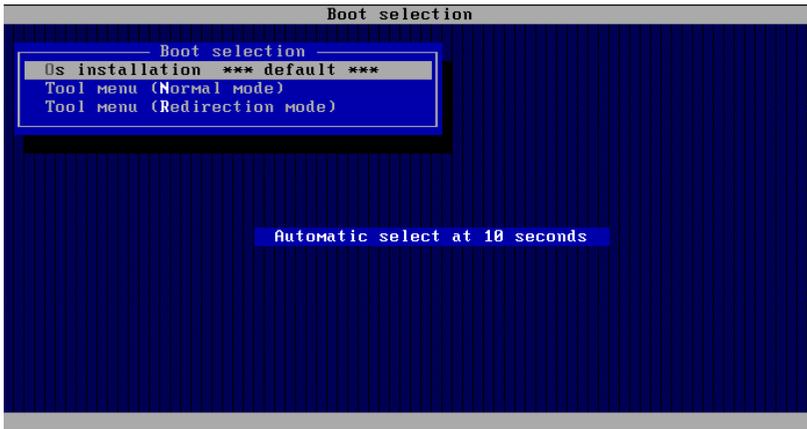
Installing the Windows Server 2008

Express Setup proceeds the setup by selecting or inputting several parameters on the wizard. You can also save the parameters to a floppy disk as a parameters file.

1. Turn the power of peripheral device on, and then turn on the server.
2. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive of the server.
3. Press the RESET switch or press **Ctrl, Alt, and Delete** to reboot from the NEC EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)

The system will boot from the DVD and NEC EXPRESSBUILDER starts.

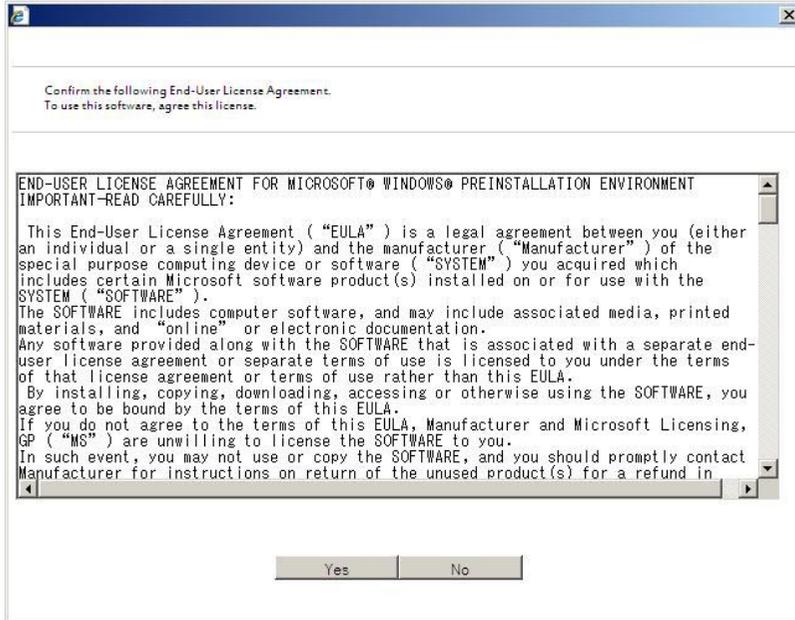
Select "Os installation *** default ***" from the Boot selection menu.
(If you do not hit any key, "Os installation" is selected automatically.)



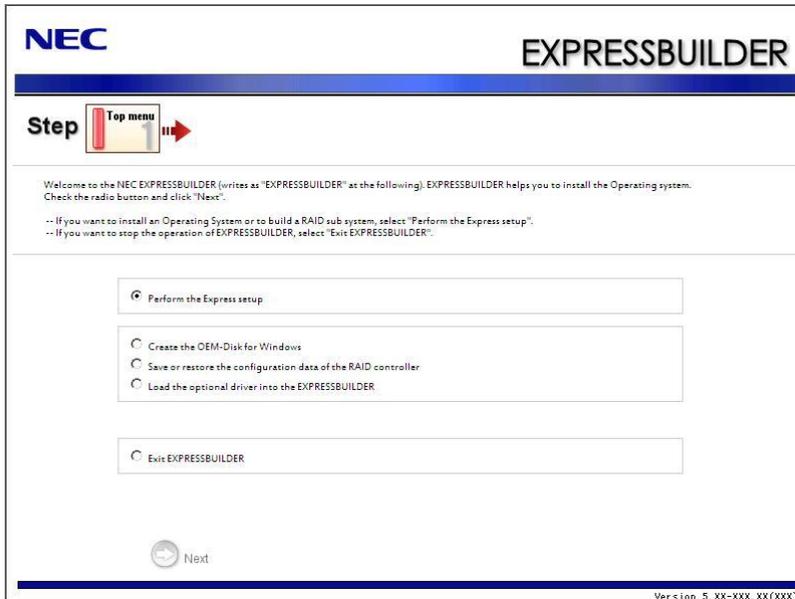
4. Select [English] from the Select Language, click [OK].



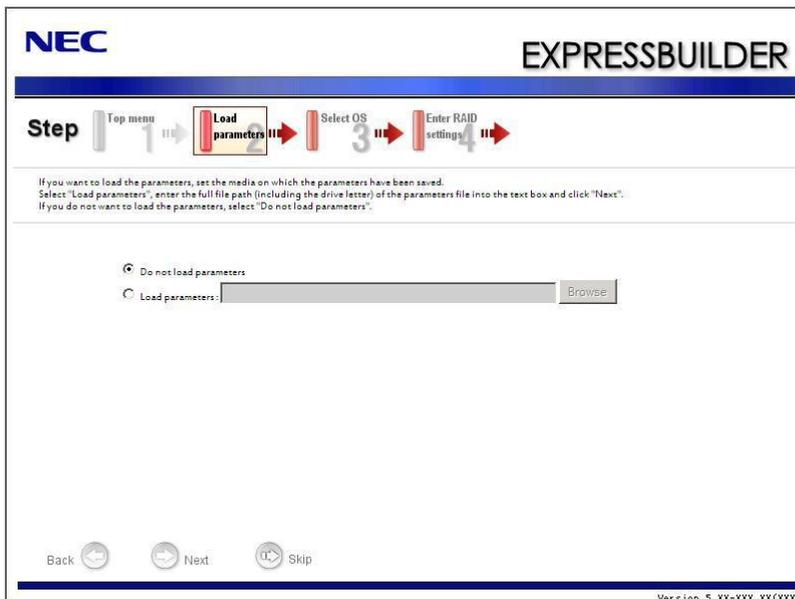
5. When the Software License Agreement screen of Windows PE appears, click [Yes].



6. Select [Perform the Express setup] from the Top Menu, click [Next].



7. [Load parameters] steps are displayed.



[Do not load parameters]

- (1) Select [Do not load parameters].
- (2) Click [Next].

IMPORTANT: The setup using a parameter file saved in the Flash FDD is not supported.

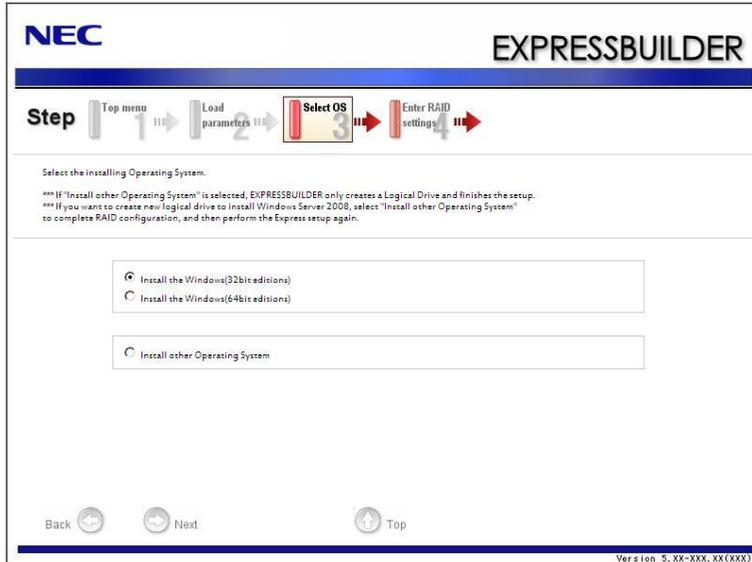
NOTE: If a floppy disk drive is not connected, select this item.

[Load parameters]

- (1) Insert the floppy disk containing the parameters file.
- (2) Select [Load parameters], enter the file path of the parameters file into the text box.
- (3) Click [Next].

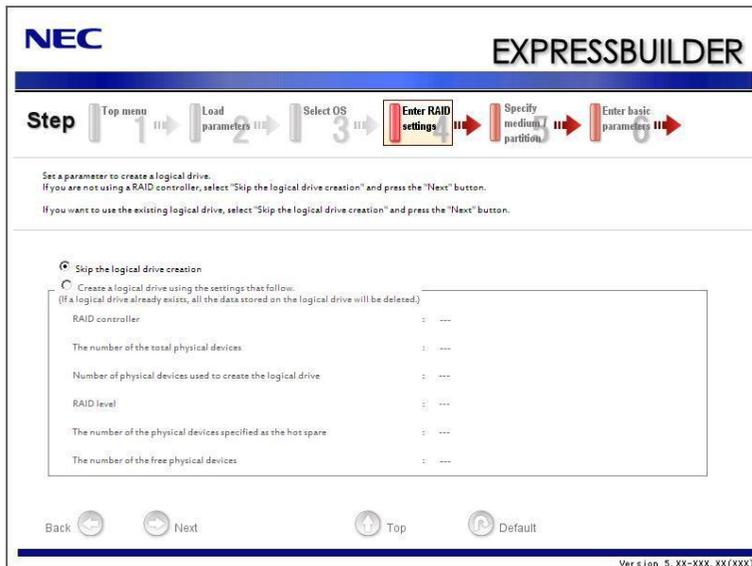
8. Select the installing Operating System.

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



9. Enter the setting of a logical drive.

[Enter RAID settings] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].

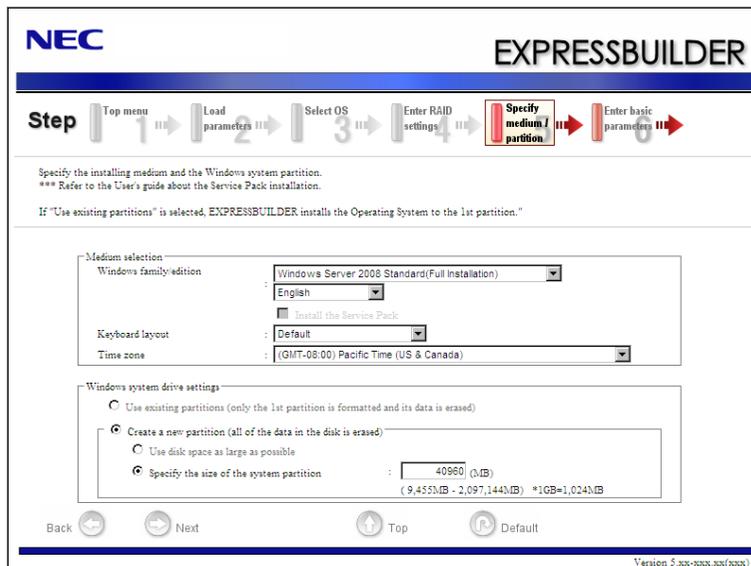


NOTES:

- You can use only the physical devices that have same model number to configure logical drive.
- If the process is not finished normally, the driver may not be stored in the NEC EXPRESSBUILDER. Refer to "Optional Board Supported by NEC EXPRESSBUILDER" described earlier in this chapter.

10. Specify the installing medium and the Windows system partition.

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



IMPORTANT:

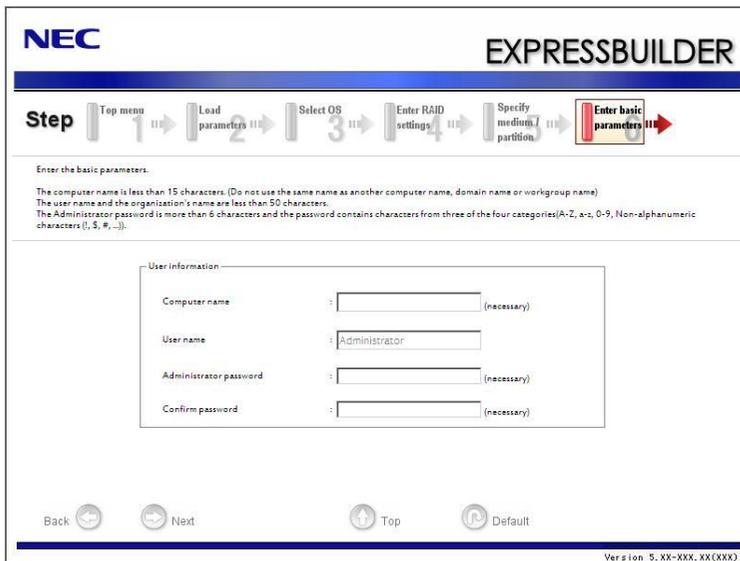
- About partition size
 - Specify the partition size larger than required minimum size for OS installation.
 - Do not specify larger partition size than the capacity of connected hard disk drive.
 - You can not specify a logical drive larger than 2,097,144MB at RAID system.
- If you select "Create a new partition" at "Windows system drive settings", the contents of the hard disk will be all deleted.
- If "Use existing partitions" is selected, NEC EXPRESSBUILDER installs the Operating System to the 1st partition (1st partition is deleted). The data in the other partition is kept if the system has two or more partitions. (See the figure below.)

First Partition Deleted	Second Partition Retained	Third Partition Retained
-------------------------------	---------------------------------	--------------------------------

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

11. Enter the user information.

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



IMPORTANT: Computer name and Administrator password that satisfy the next condition, are required.

- More than 6 characters
- Contains characters from three of the following categories (numbers, uppercase letters, lowercase letters, and signs).

12. Enter the setting of the network protocol.

[Enter Network Protocol] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].

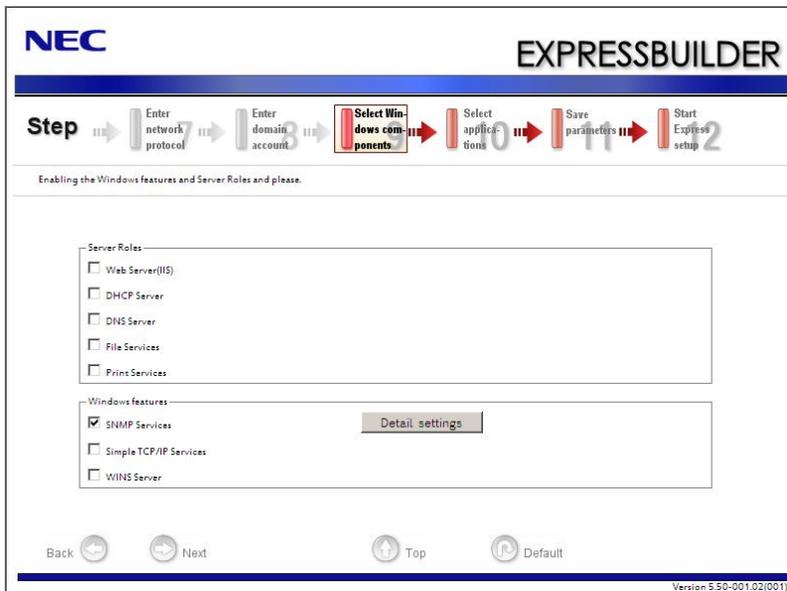
13. Enter the domain or workgroup name to be used.

[Enter domain account] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].

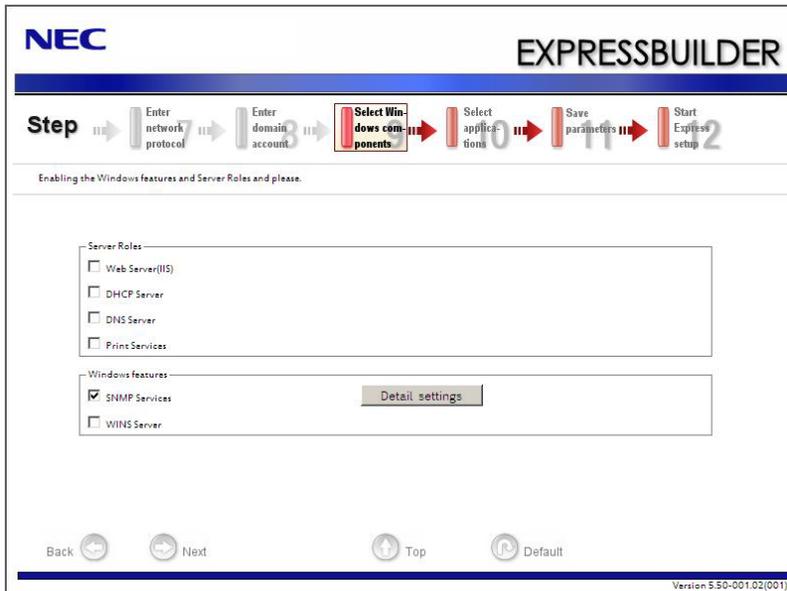
14. Select the installing components.

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

<Full Installation>

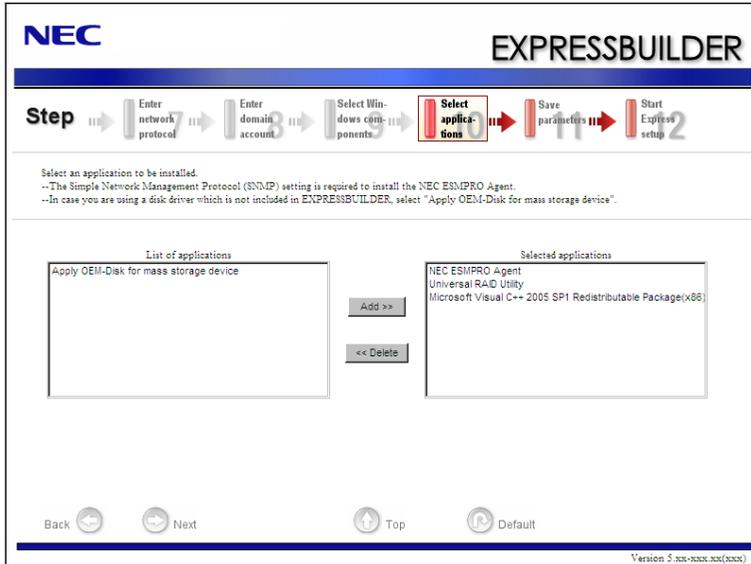


<Server Core Installation>



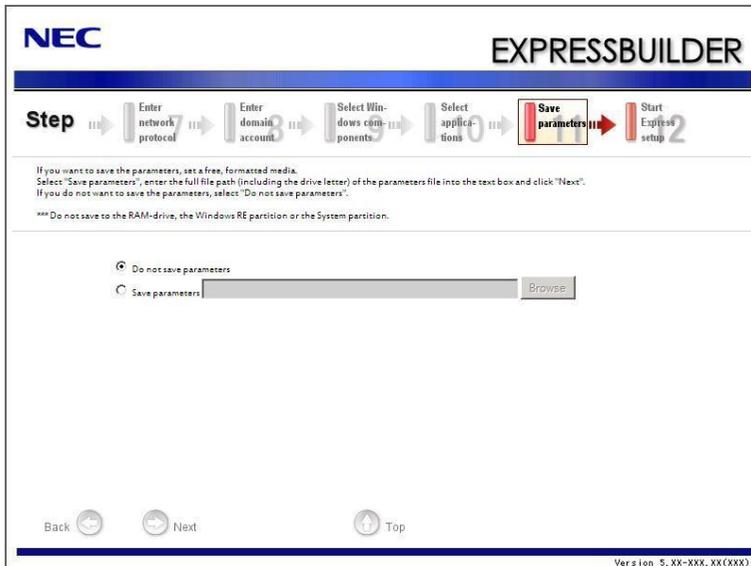
15. Select the installing applications.

[Select applications] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].



16. Save the parameters.

[Save parameters] steps are displayed.

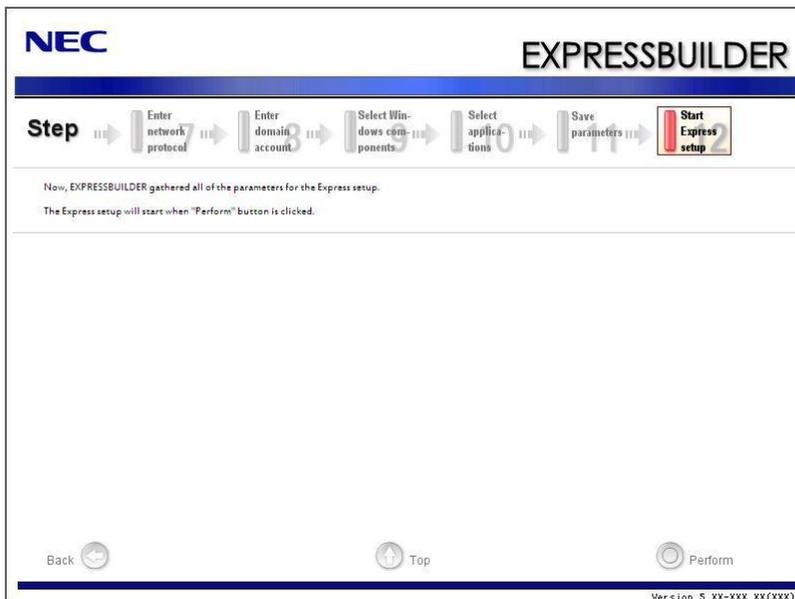


If you want to save the parameters, set the free formatted floppy disk.

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

If not, select [Do not save parameters].

- 17. The Express Setup will start when you click [Perform] in [Start Express setup] step.



- 18. Remove NEC EXPRESSBUILDER DVD from the optical disk drive according to the message.

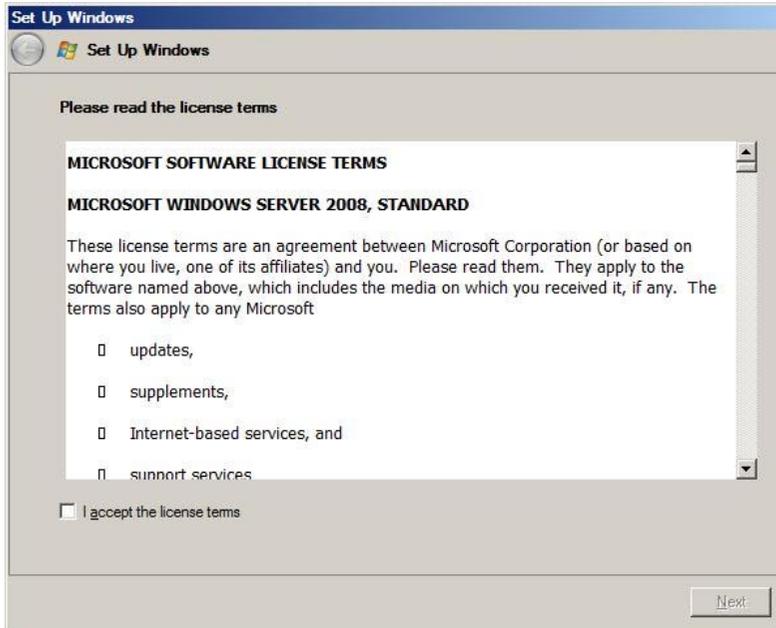
If you proceed the setup by using setup parameter file, remove the floppy disk from the floppy disk drive.

- 19. Insert Windows Server 2008 DVD-ROM into the optical disk drive.

NOTE: Windows Server 2008 and selected applications will be installed automatically and reboots several times.

20. [Agree Software License Agreement] screen appears.

Read the license terms carefully. If you agree, select I accept the license terms, and then click [Next].



21. When the following message appears, click [Start].



22. When the following message appears, press **Ctrl + Alt + Del**.

Press CTRL + ALT + DELETE to log on

23. Log on to the system.

<Full Installation>

When the following screen appears, enter your password into "Password", and click .



<Server Core Installation>

When the following screen appears, click "Other User".



In the following screen, enter "Administrator" into [UserName], your password into "Password", and click .



Hereinafter, proceed operations according to the message.

Now the Setup using Express Setup has completed.

After Express Setup has completed, be sure to execute the tasks described in "Installing and Setting Device Drivers".

Installing and Setting Device Drivers

Follow these steps to install and configure the device drivers.

LAN Driver and PROSet

The LAN driver and PROSet have been installed automatically while your system was being updated in the previous section.

NOTES:

- To change the LAN driver and PROSet settings, log on to the system from a local console using an administrator account. Remotely changing the settings by using the operating system's remote desktop feature is not supported.
 - [Internet Protocol (TCP/IP)] check-box is necessary checked to set an IP Addresses. According to the circumstances, the check-box is not checked from begin. Manually checked the check box and set an IP addresses.
-

Using N8104-125A Adapter after System Update

To use the N8104-125A Adapter after updating your system, you must first uninstall the LAN driver and PROSet, and then update your system with the N8104-125A Adapter connected.

For a server running a full installation

1. Remove a team of network adapters.

NOTE: Before you remove, note down the current settings (e.g. IP addresses) of the standard and optional adapters teamed for network redundancy.

Configure the settings after reinstalling the LAN driver and PROSet.

To remove the team, see "Setup Team".

2. In [Control Panel], click [Uninstall Program].
3. Double-click [Intel(R) Network Connections 14.8.43.0].
[Intel(R) Network Connections (Remove Options)] appears.
4. In [Remove Options], click [Remove].
[Intel(R) Network Connections - Remove Software] appears.
5. Select [Yes].
Uninstallation starts automatically.

6. When [InstallShield Wizard Completed] appears. Click [Finish].
7. Restart the system.

For a server running a Server Core installation

1. Note down the current settings (e.g. IP addresses) of the standard and optional adapters teamed for network redundancy before uninstalling LAN driver.
Configure the settings after reinstalling the LAN driver.
2. At a command prompt, run dxsetup.exe in your removable medium containing the Driver Set.
 - Windows Server 2008 64-bit (x64) Editions:
 <drive letter>:\018\win\winnt\ws2008x64\r148\apps\prosetdx\vistax64\dxsetup.exe
 - Windows Server 2008 32-bit (x86) Editions:
 <drive letter>:\018\win\winnt\ws2008\r148\apps\prosetdx\vista32\dxsetup.exe
3. In [Intel(R) Network Connections - InstallShield Wizard], click [Next].
4. Select [Remove], and click [Next].
5. Click [Remove].
Uninstallation starts automatically.
6. When [InstallShield Wizard Completed] appears, click [Finish].
7. Restart the system.

LAN Driver Setting

- Link Speed
LAN drivers will be installed automatically, but the link speed and Duplex mode need to be specified manually.

1. Open the [Device Manager]
2. Double-click [(Network Adapter Name)] in the list.
3. Click the [Link Speed] and specify the [Speed & Duplex] value the same as the value specified for HUB.
4. Click [OK].
5. Restart the system.

- WOL
Refer to the following procedure for WOL (Wake On LAN) setting.

1. Start Device Manager.
2. Point to [Network adapters] and double click following adapter.
Open the adapter [Properties].

[Intel(R) 82574L Gigabit Network Connection]
[Intel(R) 82574L Gigabit Network Connection #2]

3. Click [Power Management] tab and change setting in [Wake On LAN] according to the following list.

Setting item	Using WOL	Not using WOL
"Wake On Directed Packet"	ON or OFF	OFF
"Wake On Magic Packet"	ON	OFF
"Wake on Magic Packet from power off state"	ON	OFF
"Wake on Link"	OFF	OFF

IMPORTANT:

- WOL does not work by Directed Packet (*1) on shutdown state even "Wake On Directed Packet" is "ON". (WOL work by Directed Packet on sleep and hibernate state.).

*1 The packet which includes Ethernet address of adapter in Ethernet Header or the Packet including the IP address assigned by IP Header to adapter.

NOTES:

- [Power Saver Options] setting is not necessary to change.
 - Above setting will be maintained until manually resetting are executed.
-

4. Click [OK].
5. Restart the system

IMPORTANT: The parameters of [Wake On LAN] will not exist, if the network ports are not available for WOL..

Setup Team

Adapter Fault Tolerance (AFT) is a feature that creates a group containing more than one adapter and automatically converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

Adaptive Load Balancing (ALB) is a feature that creates a group containing more than one adapter and enhances the throughput by operating packet transmission from the server by all the adapters.

This feature includes AFT feature.

Switch Fault Tolerance (SFT) is a feature that provides a failover relationship between two ports when each port is connected to a separate switch.

SFT supports two ports per team.

Static Link Aggregation (SLA) accounts for the GEC and 802.3ad static protocols.

SLA is a switch-assisted teaming mode and requires configuring ports at both ends of the link: server interfaces and switch ports.

IMPORTANT:

- AFT/ALB setup must be operated after system update and restarting the system.
 - All the adapters specified as a group of Adapter Teaming must exist on the same LAN. If they are connected to the separate switches, they will not work normally.
 - The adapters specified as a group of Adaptive Load Balancing (ALB) can be connected to only Switching Hub.
 - When exchange the mother board or option network card, make sure to remove the adapter team before exchanges and recreate the adapter team after exchange complete.
 - Please confirm the port setting of switching hub (L2) matches the server network adapter Teaming mode.
 - Teaming is not supported with Windows Server Core.
 - If you want to change the type of a teaming, be sure to remove the teaming first, then re-setup a new teaming. Do not use the function of PROSet to change the type of a teaming.
-

Create Team

1. Open the [Device Manager].
2. Open [Network adapters] → [Intel(R) xxx] properties.
3. Click [Teaming] tab and check the [Team this adapter with other adapters] check box. Click [New Team].
4. Fill the name of the team in [Specify a name for the team] and click [Next].
5. Include the adapter to the team and click [Next].
6. Select a team mode, and then click [Next].

IMPORTANT: Following team types are supported

- Adapter Fault Tolerance
 - Adaptive Load Balancing
 - Static Link Aggregation
 - Switch Fault Tolerance
-

7. Click [Finish].
8. Click [TEAM: "Team name"] from [Device manager] → [Network adapters] to modify the team.
Click [Settings] tab and click [Modify Team] button.
9. Refer to the following procedure to set the team member adapter priority status.
 - Set Primary
Point the adapter and click [Set Primary] button.
 - Set Secondary
Point the adapter and click [Set Secondary] button.

NOTE: Adapter priority config can be confirmed by the following procedure:

1. Click [TEAM: "Team name"] from [Device manager]→[Network adapters].
 2. Click [Settings] and confirm Adapters in team list.
-

10. Click [Test Switch] → [Run test] to confirm the adapter team is properly setup. Confirm the result in [Test results]
11. Restart the system.

Remove Team

1. Open the [Device Manager].
2. Click [Network adapters], and open [TEAM: "Team name"] properties.
3. Click [Setting] tab.
4. Click [Remove Team] button.
5. Click [Yes] to the message.
6. Confirm [TEAM: "Team name"] adapter is not existing in [Network adapters] tree and reboot the system.

LAN Board Driver (N8104-122/125A/126)

The following LAN boards are available for the N8104-122/125A/126.

To use the N8104-125A Adapter, see "Using N8104-125A Adapter after System Update" in the previous page.

The drivers for other network boards are automatically installed by Windows Plug-and-Play. You do not need to install them manually.

Graphics Accelerator Driver

If you use standard graphics accelerator drivers, update your system with NEC EXPRESSBUILDER DVD attached to your system.

Standard graphics accelerator drivers will be installed automatically.

Please refer to "Graphics Accelerator Driver" described in Appendix E when you want to reinstall the driver individually.

Installing SCSI Controller Driver (N8103-107)

If you use the SCSI Controller N8103-107, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing SAS Controller Driver (N8103-104A)

If you use the SAS Controller N8103-104A, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing RAID Controller Driver (N8103-135)

If you use the RAID Controller N8103-135, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing the Fibre Channel Controller Driver (N8190-127/131/153/154)

If you use the Fibre Channel Controller (N8190-127/131/153/154), you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

The procedure to set PAE option

If your 32-bit system has a memory capacity in excess of 4GB, setting PAE option will enable the system to be installed with over 4GB of memory.

IMPORTANT: "PAE option" is not supported on Windows Server 2008 Standard.

In Windows Server 2008 system, the PAE option can be set by using Bcdedit.exe.

The setting procedure is as follows.

1. Click [Run] on [Start] menu.
2. Type "cmd.exe" in the [Open:] box to start command prompt.
3. Execute following command line.

```
bcdedit /set pae forceenable
```

4. Restart the system.

The setting mentioned above enables after reboot.

5. Execute following command line on command prompt.

```
bcdedit
```

Confirm "pae ForceEnable" exists in "Windows boot loader".

The setting for PAE option is now completed.

Refer following site about Bcdedit.exe

"Boot Configuration Data Editor Frequently Asked Questions"

[http://technet.microsoft.com/en-us/library/cc721886\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/cc721886(WS.10).aspx)

Setting for Solving Problems

Setup your computer in advance so that it can recover from any trouble precisely and as soon as possible when it should occur.

For more information, refer to Page 5-84.

Windows Server 2003

This section explains how to install Microsoft® Windows Server® 2003 by using the Express Setup.

NOTES:

- Express Setup does not support the installation of Windows Server 2003 x64 Editions. If you want to install it, see Appendix F.
 - If you install Windows Server 2003 without using Express Setup, see Appendix G.
-

Notes on Windows Installation

This section explains the notes on the Windows installation.

Confirm these notes before starting the Express Setup.

About the Windows family

This computer supports the following Windows editions:

- Microsoft® Windows Server® 2003 R2 Standard Edition (hereinafter, referred to as "Windows Server 2003")
- Microsoft® Windows Server® 2003 R2 Enterprise Edition (hereinafter, referred to as "Windows Server 2003")

NOTE: Express Setup does not support the installation of Windows Server 2003 x64 Editions. If you want to install it, see Appendix F.

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

BIOS Settings

Confirm the BIOS settings described in Chapter 4 before installing Windows Server 2003.

Service Pack Which NEC EXPRESSBUILDER Supports

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

- Windows Server 2003 R2
 - OS installation media (with Service Pack 2)
 - OS installation media (No Service Pack) + Service Pack 2
 - OS installation media (No Service Pack)

Supported Mass Storage Controllers

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

NOTE: If you want to install the other boards by using a driver floppy disk ("OEM-Disk for Mass storage device"), except ones listed below, see "Installing with the OEM-Disk for Mass storage device".

- Controllers supporting installation of OS with Express Setup
 - N8103-129 RAID Controller (256 MB, RAID0/1)*
 - N8103-130 RAID Controller (256 MB, RAID0/1/5/6)*
 - N8103-134 RAID Controller (512 MB, RAID0/1/5/6)*
 - Onboard RAID Controller (LSI Embedded MegaRAID™)
 - Other controllers
 - N8103-104A SAS Controller*
 - N8103-107 SCSI Controller*
 - N8103-135 RAID Controller (512 MB, RAID0/1/5/6)*
- * Option

NOTES:

- The driver of option card mentioned above is stored in the NEC EXPRESSBUILDER DVD.
 - If you use the board not mentioned above, the Express Setup will fail. Refer to the instructions attached to the board.
-

About the Hardware Components

When you install the Windows Server 2003, Express Setup requires several preparations if this computer uses the following hardware components.

Installing on the Mirrored Volume

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

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

About Removable Media

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

Connecting Hard Disk Drive

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

If you create multiple logical drives in your system, see "Re-installing the Operation System if Multiple Logical Drives Exist" (5-96).

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

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

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

Peripheral Devices such as RDX

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

About the System Partition Size

The system partition size can be calculated from the following formula.

Size necessary to install the system	+ Paging File Size + Dump File Size
	+ Application Size
Size necessary to install the system	= 3500MB (Windows Server 2003 R2)
	= 3500MB (Windows Server 2003 R2 with Service Pack 2)
	= 5300MB (Windows Server 2003 R2 + Service Pack 2 CD-ROM)
Paging File Size (Recommended)	= Mounted Memory Size * 1.5
Dump File Size	= Mounted Memory Size + 12MB
Application Size	= Required Size

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
 - The maximum paging file size which can be set on one partition is 4095MB. If the above paging file size exceeds 4095MB, specify 4095MB for the paging file size.
 - The maximum dump file size for the system with more than 2GB memory mounted is '2048MB + 12MB'.
 - If you install any application program or the like, add necessary space to the partition to install these programs.
-

For example, if the mounted memory size is 1GB (1,024MB), the partition size will be calculated by the above formula as follows:

$$3,500\text{MB} + (1,024\text{MB} * 1.5) + (1,024\text{MB} + 12\text{MB}) + \text{Application Size} \\ = 6,072\text{MB} + \text{Application Size}$$

Dividing into the partition of the recommended size into multiple disks as written below will solve problem that it cannot be reserved in one disk.

1. Set the "Size required for installation + Paging file size".
2. See Chapter 5 and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.

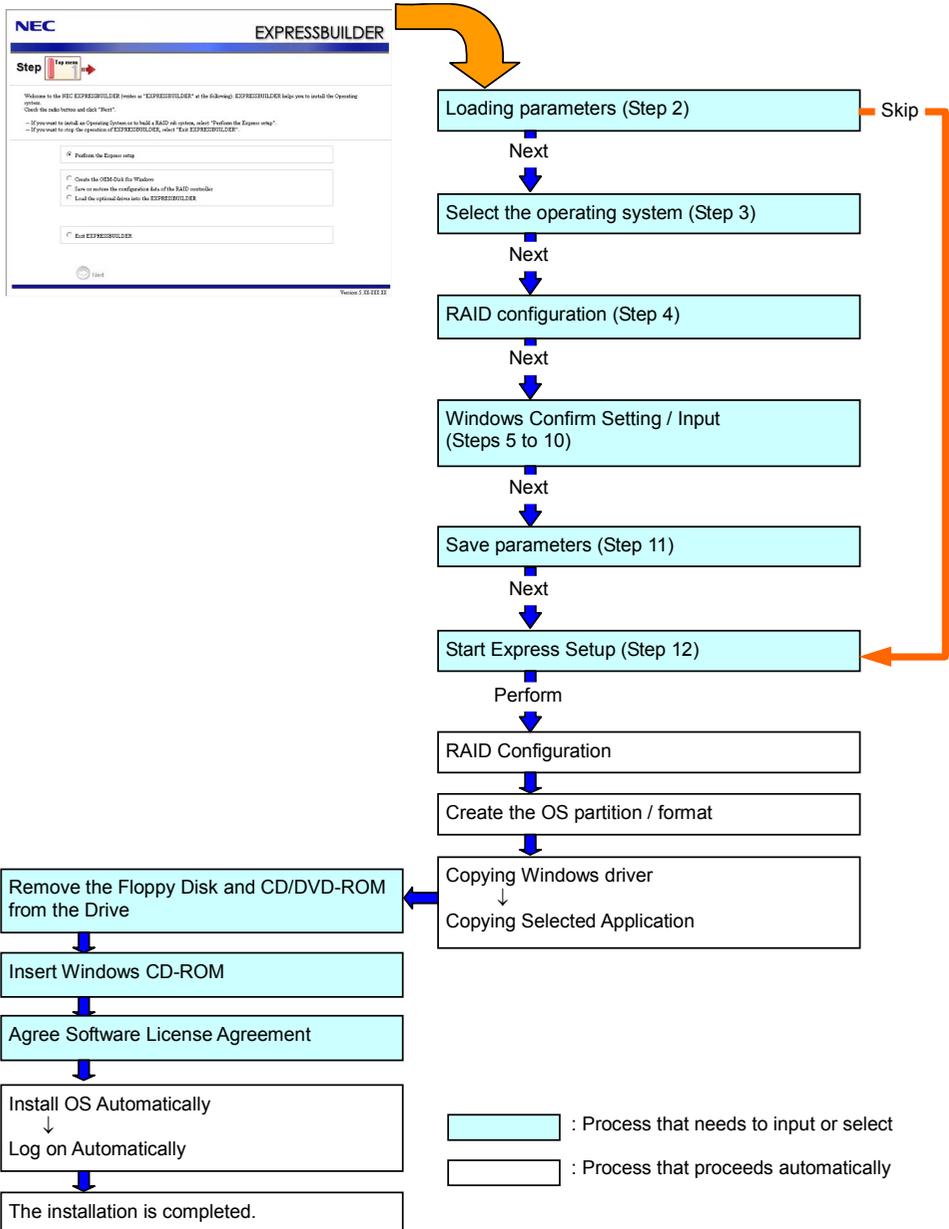
(If the disk does not have enough free space to enable the dump file size to be written, then after installing the system using the "Size required for installation + Paging file size", install an additional new disk.)

Installing the Service Pack

When installing Windows Server 2003 R2, it is not necessary to install the Service Pack 1.

FLOW OF SETUP

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



INSTALLING Windows Server 2003

Express Setup proceeds the setup by selecting or inputting several parameters on the wizard. You can also save the parameters to a floppy disk as a parameters file.

1. Turn the power of peripheral device on, and then turn on the server.
2. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive of the server.
3. Press the RESET switch or press **Ctrl, Alt, and Delete** to reboot from the NEC EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)

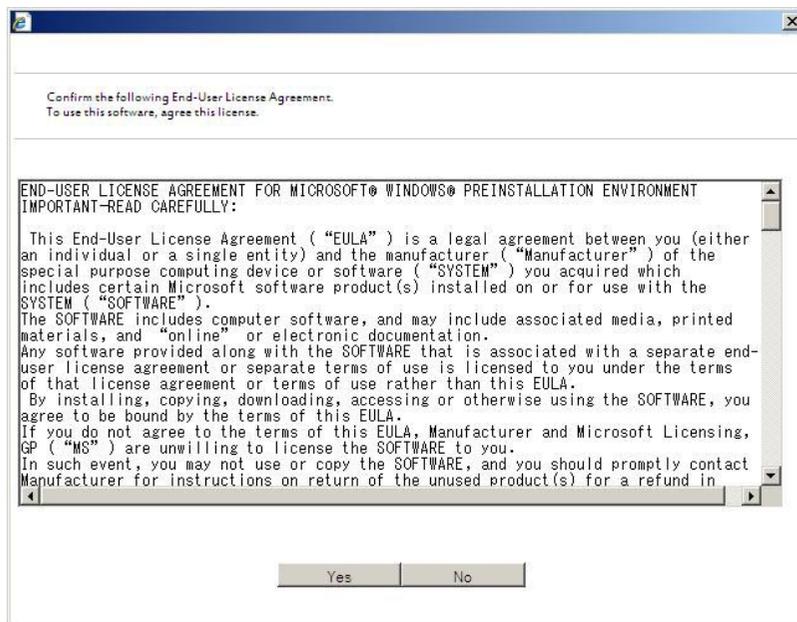
The system will boot from the DVD-ROM and NEC EXPRESSBUILDER starts.

Select "Os installation *** default ***" from the Boot selection menu. (If you do not hit any key, "Os installation" is selected automatically.)

4. Select [English] from the [Select Language], click [OK].



5. When the Software License Agreement screen of Windows PE appears, click [Yes].



6. Select [Perform the Express setup] from the Top Menu, click [Next].

NEC **EXPRESSBUILDER**

Step 

Welcome to the NEC EXPRESSBUILDER (writes as "EXPRESSBUILDER" at the following). EXPRESSBUILDER helps you to install the Operating system.
Check the radio button and click "Next".

-- If you want to install an Operating System or to build a RAID sub system, select "Perform the Express setup".
-- If you want to stop the operation of EXPRESSBUILDER, select "Exit EXPRESSBUILDER".

Perform the Express setup

Create the OEM-Disk for Windows

Save or restore the configuration data of the RAID controller

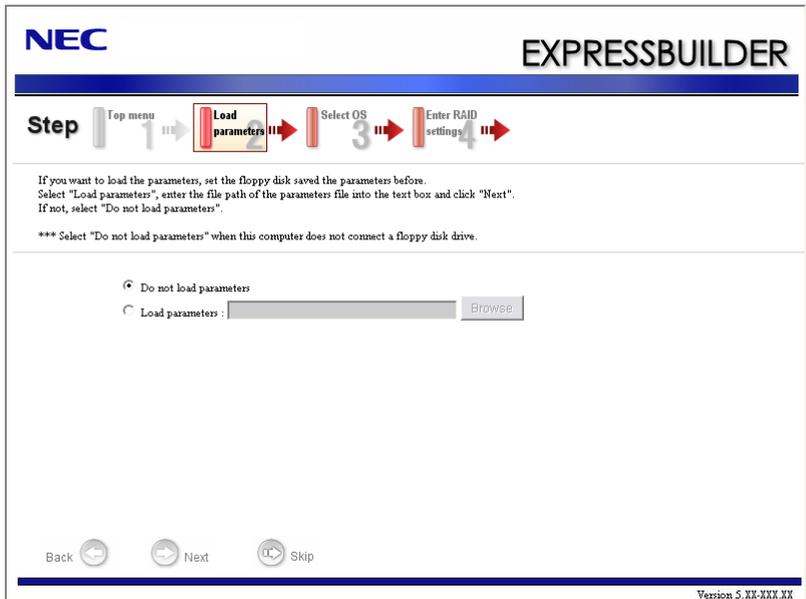
Load the optional driver into the EXPRESSBUILDER

Exit EXPRESSBUILDER

 Next

Version 5.XX-XXX.XX

7. [Load parameters] steps are displayed.



[Do not load parameters]

- (1) Select [Do not load parameters].
- (2) Click [Next].

IMPORTANT: The setup using a parameter file saved in the Flash FDD is not supported.

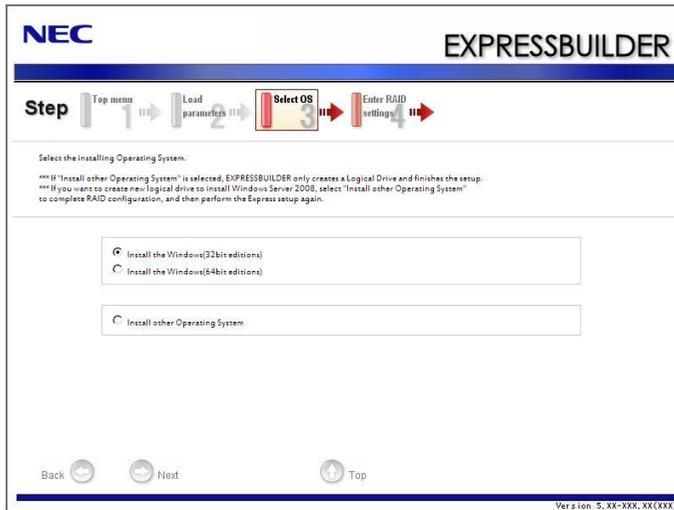
NOTE: If a floppy disk drive is not connected, select this item.

[Load parameters]

- (1) Insert the floppy disk containing the parameters file.
- (2) Select [Load parameters], enter the file path of the parameters file into the text box.
- (3) Click [Next].

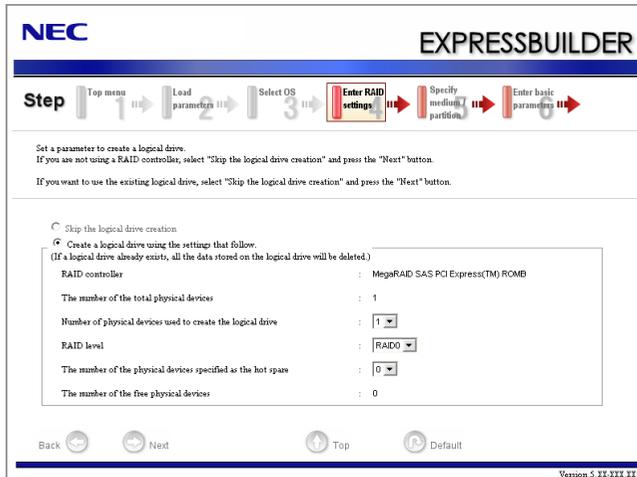
8. Select the installing Operating System.

Select [Install the Windows (32bit editions)] from the menu, click [Next].



9. Enter the setting of a logical drive.

[Enter RAID settings] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].

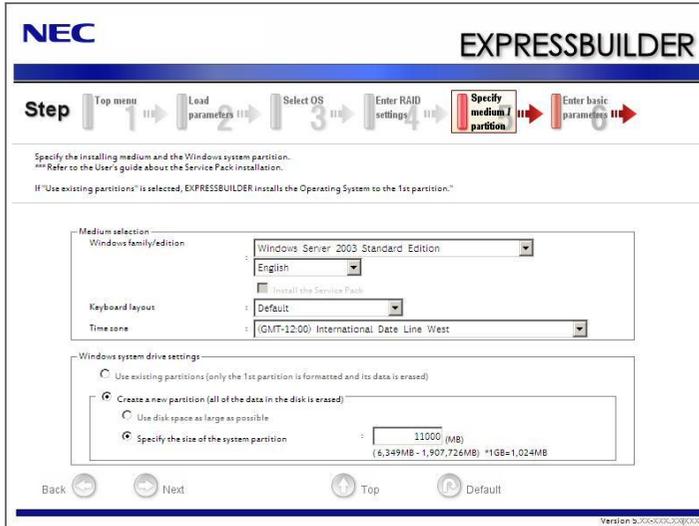


NOTES:

- You can use only the physical devices that have same model number to configure logical drive.
- If the process is not finished normally, the driver may not be stored in the NEC EXPRESSBUILDER. Refer to "Optional Board Supported by NEC EXPRESSBUILDER" described earlier in this chapter.

10. Specify the installing medium and the Windows system partition.

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



IMPORTANT:

- If you install Windows Server 2003 R2 and Service Pack, apply Windows Server 2003 R2 DISC 2 after Express Setup completion, and then install Service Pack by "Updating the system".
- About partition size
 - Specify the partition size larger than required minimum size for OS installation.
 - Do not specify larger partition size than the capacity of connected hard disk drive.
 - You can not specify a logical drive larger than 2,097,144MB at RAID system.
- If you select "Create a new partition" at "Windows system drive settings", the contents of the hard disk will be all deleted.
- If "Use existing partitions" is selected, NEC EXPRESSBUILDER installs the Operating System to the 1st partition (1st partition is deleted). The data in the other partition is kept if the system has two or more partitions. (See the figure below.)

First Partition Deleted	Second Partition Retained	Third Partition Retained
-------------------------------	---------------------------------	--------------------------------

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

11. Enter the user information and client license mode.

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

NEC EXPRESSBUILDER

Step 1 Top menu 2 Load parameters 3 Select OS 4 Enter RAID settings 5 Specify medium / partition 6 **Enter basic parameters**

Enter the basically parameters.
The computer name is less than 15 characters. (Do not set the same name as other computer name, domain name or workgroup name)
The user name and the organization's name are less than 50 characters.

User information

Computer name : (necessary)

User name : (necessary)

Organization's name :

Administrator password :

Confirm password :

Client licence

Per server mode :

Per user or per device mode

Back Next Top Default

Version 5.XX.XXX.XX

NOTE: Even if you do not input value into "Administrator password", "Confirm password", "●●●●●" is displayed.

12. Enter the setting of the network protocol.

[Enter Network Protocol] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].

NEC EXPRESSBUILDER

Step 7 **Enter network protocol** 8 Enter domain account 9 Select Windows components 10 Select applications 11 Save parameters 12 Start Express setup

Enter the settings of the network protocol.
If you want to set the IP address, select "Customized settings" and click "Detail settings".
If not, select "Standard setting" and click "Next".

Standard setting

Customized settings

standard adaptor -- internet protocol2

Back Next Top Default

Version 5.XX.XXX.XX

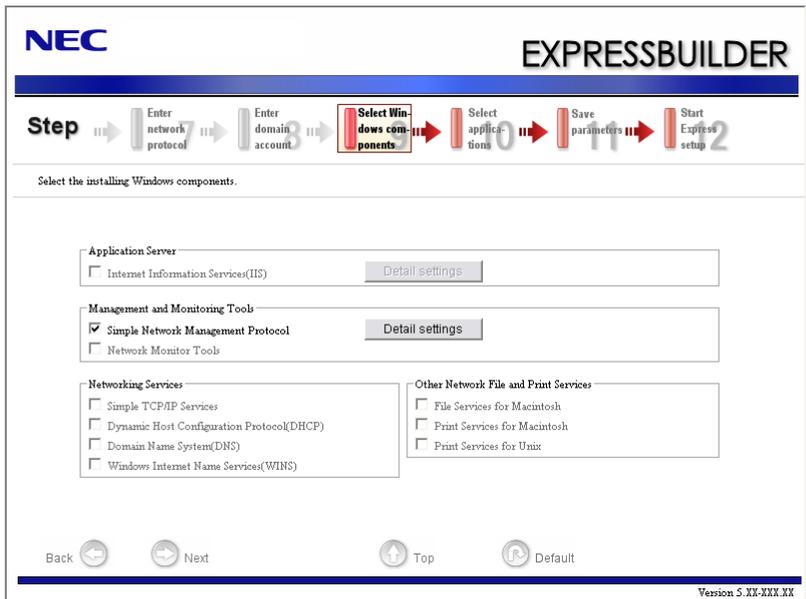
13. Enter the domain or workgroup name to be used.

[Enter domain account] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].



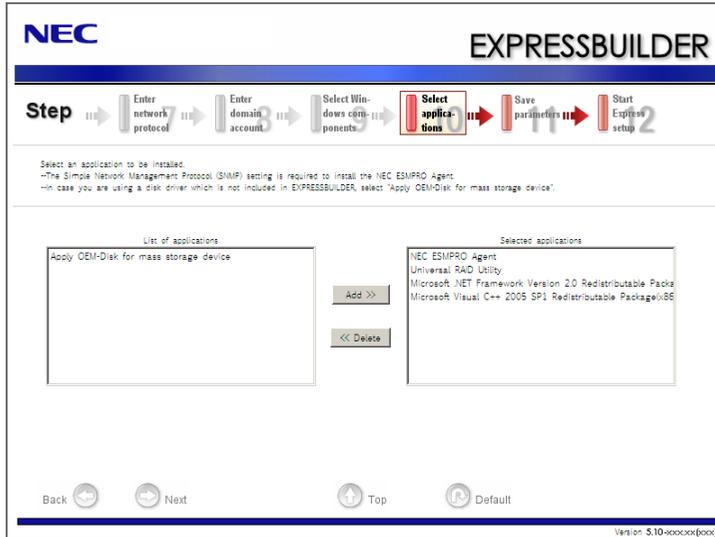
14. Select the installing components.

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



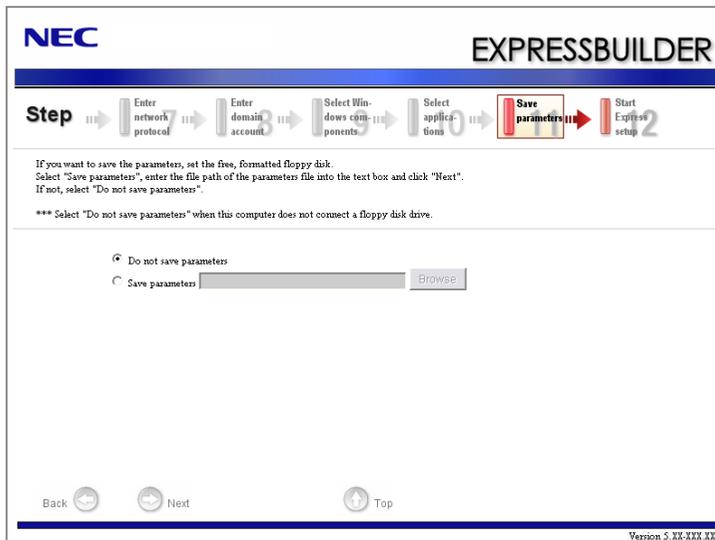
15. Select the installing applications.

[Select applications] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].



16. Save the parameters.

[Save parameters] steps are displayed.

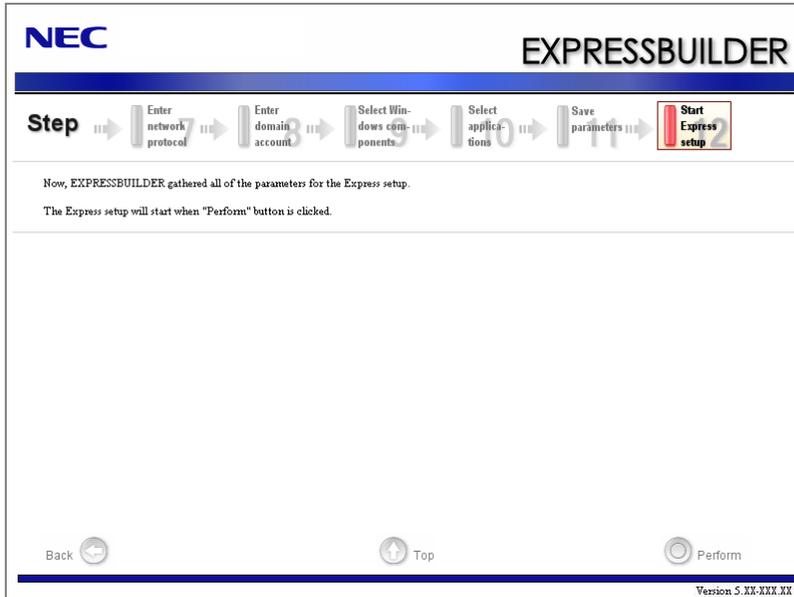


If you want to save the parameters, set the free formatted floppy disk.

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

If not, select [Do not save parameters].

17. The Express Setup will start when you click [Perform] in [Start Express setup] step.



18. Remove NEC EXPRESSBUILDER DVD from the optical disk drive according to the message.

If you proceed the setup by using setup parameter file, remove the floppy disk from the floppy disk drive.

Insert Windows Server 2003 CD-ROM into the optical disk drive.

[Agree Software License Agreement] screen appears.

19. Read the contents carefully and click [Yes] if you do agree. If you do not agree, click [No].

IMPORTANT:

- If you do not agree to this agreement, the setup terminates and Windows Server 2003 will not be installed.
- If "NetWare Gateway (and Client) Service" is specified to install, the window to specify the details of "NetWare Gateway (and Client) Service" pops up on the first logon. Specify the appropriate value.
- When the following message is displayed, click [OK] and input the product key.

The setup script file does not contain a valid Product ID.
Contact your system administrator for a valid Product ID.

20. Insert Microsoft Windows Server 2003 R2 DISC 2 into the optical disk drive after the OS installation.

Hereinafter, proceed operations according to the message.

When the installation has finished, remove Microsoft Windows Server 2003 R2 DISC 2 from the optical disk drive, and restart the system.

Now the Setup using Express Setup has completed.

INSTALLING AND SETTING DEVICE DRIVERS

Follow these steps to install and configure the device drivers.

LAN Driver and PROSet

- LAN driver
LAN drivers will be installed automatically.
- PROSet

NOTES:

- All of the operation that related to Intel® PROSet must be executed by administrator privileges. Operation by [Remote Desktop Connection] is prohibited.
Without changing any parameter when opened the properties of adapter teaming, please click the [Cancel] button for close the dialog
Click [OK] button will cause temporary loss of network connectivity.
 - [Internet Protocol (TCP/IP)] check-box is necessary checked to set an IP Addresses. According to the circumstances, the check-box is not checked from begin. Manually checked the check box and set an IP addresses.
-

PROSet is a utility that confirms the function of network contained in network driver.

Utilizing PROSet enables the following items:

- Confirm detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Setup of teaming.

Configuring several network adapters as one team provides the server a tolerant environment on any trouble and enhances throughput between the switches.

PROSet is necessary to utilize these features.

Follow the procedure below to install PROSet.

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

If the autorun menu is displayed, close menu screen.

2. The [Windows Explorer] dialog starts.

* The procedure in the case of the standard start menu

Click Start menu and click [Windows Explorer].

* The procedure in the case of the classic start menu

Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].

3. Run "dxsetup.exe" in the following directory.
 \018\win\winnt\dotnet\r148\apps\prosetdx\win32
 The [Intel(R) PROSet - InstallShield Wizard] dialog starts.
4. Click [Next].
5. Choose "I accept the terms in the license agreement" and click [Next].
6. Click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finished].
9. Remove the NEC EXPRESSBUILDER DVD from the optical disk drive, restart the system.

LAN Driver Setting

- Link Speed
LAN drivers will be installed automatically, but the link speed and Duplex mode need to be specified manually.

When PROSet is not installed

1. Open the [Device Manager]
2. Double-click [(Network Adapter Name)] in the list.
3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.
4. Click [OK].
5. Restart the system.

When PROSet is installed

1. Open the [Device Manager]
2. Double-click [(Network Adapter Name)] in the list.
3. Click the [Link Speed] and specify the [Speed & Duplex] value the same as the value specified for HUB.
4. Click [OK].
5. Restart the system.

- WOL
Refer to the following procedure for WOL (Wake On LAN) setting.

When PROSet is not installed

1. Start Device Manager.
2. Point to [Network adapters] and double click following adapter.
Open the adapter [Properties].

[Intel(R) 82574L Gigabit Network Connection]
[Intel(R) 82574L Gigabit Network Connection #2]

3. Click [Power Management] tab and change setting in [Wake On LAN] according to the following list.

Setting item	Using WOL	Not using WOL
"Allow the computer to turn off this device to save power"	ON	ON
"Allow this device to bring the computer out of standby"	ON or OFF	OFF

IMPORTANT:

- Set "Allow this device to bring..." "ON", WOL by Directed Packet(*1) or Magic Packet will available on Standby and Hibernate state.
 - WOL by Directed Packet is not available on Shutdown state.
- *1 Packet with the Ethernet address of the adapter in Ethernet header or Packet with an IP address assigned to the adapter in IP header.
-

4. Click [Advanced] tab and point to [Enable PME].
5. Set the "Enable" in [Value].
 - Using WOL: ON
 - Not using WOL: OFF
6. Click [OK].
7. Restart the system

When PROSet is installed

1. Start Device Manager.
2. Point to [Network adapters] and double click following adapter.
Open the adapter [Properties].

[Intel(R) 82574L Gigabit Network Connection]
[Intel(R) 82574L Gigabit Network Connection #2]

3. Click [Power Management] tab and change setting in [Wake On LAN] according to the following list.

Setting item	Using WOL	Not using WOL
"Wake On Directed Packet"	ON or OFF	OFF
"Wake On Magic Packet"	ON	OFF
"Wake on Magic Packet from power off state"	ON	OFF
"Wake on Link"	OFF	OFF

IMPORTANT:

- Directed Packet(*1) will not wake up the system on Shutdown state even "Wake On Directed Packet" is set to "ON".
Only on Standby or Hibernate state will wake up by a Directed Packet.
- The parameters of [Wake On LAN] will not exist, if the network ports are not available for WOL.

*1 Packet with the Ethernet address of the adapter in Ethernet header or Packet with an IP address assigned to the adapter in IP header.

NOTES:

- [Power Saver Options] setting is not necessary to change.
 - Above setting will be maintained until manually resetting are executed.
-

4. Click [OK].
5. Restart the system

IMPORTANT: The parameters of [Wake On LAN] will not exist, if the network ports are not available for WOL.

Setup Team

Adapter Fault Tolerance (AFT) is a feature that creates a group containing more than one adapter and automatically converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

Adaptive Load Balancing (ALB) is a feature that creates a group containing more than one adapter and enhances the throughput by operating packet transmission from the server by all the adapters.

This feature includes AFT feature.

Switch Fault Tolerance (SFT) is a feature that provides a failover relationship between two ports when each port is connected to a separate switch.

SFT supports two ports per team.

Static Link Aggregation (SLA) accounts for the GEC and 802.3ad static protocols.

SLA is a switch-assisted teaming mode and requires configuring ports at both ends of the link: server interfaces and switch ports.

IMPORTANT:

- AFT/ALB setup must be operated after installing the drivers/PROSet and restarting the system.
 - All the adapters specified as a group of Adapter Teaming must exist on the same LAN. If they are connected to the separate switches, they will not work normally.
 - The adapters specified as a group of Adaptive Load Balancing (ALB) can be connected to only Switching Hub.
 - When exchange the mother board or option network card, make sure to remove the adapter team before exchanges and recreate the adapter team after exchange complete.
 - Please confirm the port setting of switching hub (L2) matches the server network adapter Teaming mode.
 - If you want to change the type of a teaming, be sure to remove the teaming first, then re-setup a new teaming. Do not use the function of PROSet to change the type of a teaming.
-

Create Team

1. Open the [Device Manager].
2. Open [Network adapters] → [Intel(R) xxx] properties.
3. Click [Teaming] tab and check the [Team this adapter with other adapters] check box. Click [New Team].
4. Fill the name of the team in [Specify a name for the team] and click [Next].

5. Include the adapter to the team and click [Next].
6. Select a team mode, and then click [Next].

IMPORTANT: Following team types are supported

- Adapter Fault Tolerance
 - Adaptive Load Balancing
 - Static Link Aggregation
 - Switch Fault Tolerance
-

7. Click [Finish].
8. Click [TEAM: "Team name"] from [Device manager] → [Network adapters] to modify the team. Click [Settings] tab and click [Modify Team] button.
9. Refer to the following procedure to set the team member adapter priority status.
 - Set Primary
Point the adapter and click [Set Primary] button.
 - Set Secondary
Point the adapter and click [Set Secondary] button.

NOTE: Adapter priority config can be confirmed by the following procedure:

1. Click [TEAM: "Team name"] from [Device manager] → [Network adapters].
 2. Click [Settings] and confirm Adapters in team list.
-

10. Click [Test Switch] → [Run test] to confirm the adapter team is properly setup.
Confirm the result in [Test results]
11. Restart the system.

Remove Team

1. Open the [Device Manager].
2. Click [Network adapters], and open [TEAM: "Team name"] properties.
3. Click [Setting] tab.
4. Click [Remove Team] button.
5. Click [Yes] to the message.
6. Confirm [TEAM: "Team name"] adapter is not existing in [Network adapters] tree and reboot the system.

LAN Board Driver (N8104-122/125A/126)

Install the driver stored in NEC EXPRESSBUILDER DVD.

Installation of the LAN Board Driver

1. Start Device Manager.
2. Click [Network adapters] and double-click [(Network Adapter Name)]. [(Network Adapter Name) Properties] appears.

NOTE: [(Intel(R) PRO/1000...)] is the name of On-Board adapter. All other names show the Optional Network Board.

3. Click [Driver] tab and click [Update Driver...]. [Hardware Update Wizard] appears.
4. Select the [Install from a list or specific location (Advanced)] radio button and click [Next].
5. Select the [Search for the best driver in these locations] radio button and uncheck the [Search removable media (floppy, CD-ROM...)] check box.
6. Check the [Include this location in the search] check box and when using [(122/125A/126)], specify [\\018\win\winnt\dotnet\r148\pro1000\win32\ndis5x].
Then click [Next].
7. Click [Finish].
8. Restart the system.

LAN Board Driver (N8104-123A)

To install the driver, refer to the installation manual provided with the board and according to the installation manual, use the driver stored in attached CD-ROM.

Graphics Accelerator Driver

If you use standard graphics accelerator drivers, update your system with NEC EXPRESSBUILDER DVD attached to your system.

Standard graphics accelerator drivers will be installed automatically.

Please refer to "Graphics Accelerator Driver" described in Appendix G when you want to reinstall the driver individually.

Installing SCSI Controller Driver (N8103-107)

If you use the SCSI Controller N8103-107, update your system with NEC EXPRESSBUILDER DVD attached to your system.

The SCSI Controller driver will be installed automatically.

Installing SAS Controller Driver (N8103-104A)

If you use the SAS Controller N8103-104A, update your system with NEC EXPRESSBUILDER DVD attached to your system.

The SAS Controller driver will be installed automatically.

Installing RAID Controller Driver (N8103-135)

The installation procedure depends on your environment.

Follow steps below appropriate to your environment.

- If the RAID Controller (N8103-134) is used:

You do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

- If the RAID Controller (N8103-134) is not used:

Update your system with NEC EXPRESSBUILDER DVD attached to your system.

The RAID Controller driver will be installed automatically.

The procedure to set PAE option

If your 32-bit system has a memory capacity in excess of 4GB, setting PAE option will enable the system to be installed with over 4GB of memory.

IMPORTANT: However, the Microsoft operating system products which support /PAE switch option are limited.

Refer to the following article in Microsoft Knowledge Base to check the supported products.

Microsoft Knowledge Base - Article ID: 291988
"A description of the 4GB RAM tuning feature and the Physical Address Extension switch"

In Windows Server 2003 system, the PAE option can be set by editing boot.ini.

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

1. Click [Start], point to [Settings], and then click [Control Panel].
2. In [Control Panel], double-click [System].
[System Properties] dialog box will be shown.
3. Click the [Advanced] tab, and then click [Settings] under [Setup and Recovery].
4. Under [System Setup], click [Edit] to open [Boot.ini].
5. Add "/PAE" to [Operating Systems] section in [Boot.ini] file, and then save it.

<Example of Boot.ini file>

```
[boot loader]
timeout=30
default=multi(0)disk(0)rdisk(0)partition(2)\WINDOWS
[operating systems]
multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003 " /fastdetect
multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003, PAE" /fastdetect /PAE
C:\CMDCONS\BOOTSECT.DAT="Microsoft Windows Recovery Console" /cmdcons
```

This is the end of editing Boot.ini file.

NOTE: If you choose one of the items in the "Default operating system" drop-down list box in [Setup and Recovery] group box, you can make your system start automatically from the switch you specified.

Setting for Solving Problems

Setup your computer in advance so that it can recover from any trouble precisely and as soon as possible when it should occur.

For more information, refer to page 5-84.

SETTING FOR SOLVING PROBLEMS

Setup the following issue in advance so that your computer can recover from any trouble precisely and as soon as possible when it should occur.

Memory Dump (Debug Information)

This section describes the procedures for collecting memory dump (debug information) in the server.

IMPORTANT: Cautions for the Memory Dump

- The staff of maintenance service representative is in charge of collecting memory dump. Customers need only to specify the memory dump.
 - If any trouble occurs after specifying the process below, the message to inform that the system is in short of virtual memory may appear, but continue to start the system. If you restart the system in such case, memory dump may not be stored correctly.
-

When the system is Windows Server 2008 R2

Follow the procedure below to specify.

1. Click Start and select [Control Panel].
The [Control Panel] window appears.
2. Click [System and Security] and then select [System].

NOTE: If [View by] is not set as [Category], start [System] from Control Panel directly.

3. Click [Advanced system settings].
The [System Properties] dialog box appears.
4. Select [Advanced] tab.
5. Click [Settings] on the [Startup and Recovery] group box.
6. Modify [Dump file] in the [Write debugging information] group box, and click [OK].
e.g. Write the debug information in D drive with the file name
"MEMORY.DMP".
D:\MEMORY.DMP

IMPORTANT:

- To specify "Complete Memory Dump" to write the debug information is recommended. If the mounted memory size is larger than 2GB, "Complete Memory Dump" cannot be specified so that specify "Kernel Memory Dump" instead.
 - Specify the drive where there is a free area more than the size of "the memory capacity mounted on Express server + 300MB".
 - In case the mounted memory size exceeds 2GB due to the added memory, change the write debugging information to [Kernel Memory Dump] before adding memory.
The size of debugging information (memory dump) to be taken also changes due to adding memory. Verify the size of the empty space in the debugging information (memory dump) write destination drive.
-

7. Click [Settings] in the [Performance] group box.
The [Performance Options] window appears.
8. Click [Advanced] tab on the [Performance Options] window.
9. Click [Change] on the [Virtual memory] group box.
10. Uncheck the [Automatically manage paging file size for all drives] box, and check [Custom size].
11. On the [Paging file size for each drive] box, specify as follows:
 - A value larger than the recommended size shown in [Total paging file size for all drives] for [Initial size]
 - A value larger than the [Initial size] for [Maximum size]Then click [Set].

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump).
The paging file with initial size large enough to store the dump file in the boot drive is required.
Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
 - For more information on "Recommended" value, see "About the System Partition Size" described earlier.
 - In case the memory is expanded, re-specify the paging file to suit the new memory size.
-

12. Click [OK].

The message to restart the system may appear according to the modified specification.

In such case, follow the message to restart the system.

When the system is Windows Server 2008

Follow the procedure below to specify.

1. Select [Control Panel] and click [System].

The [System] dialog box appears.

2. Click [Advanced system settings].

The [System Properties] dialog box appears.

3. Select [Advanced] tab.

Click [Settings] on the [Startup and Recovery] group box.

4. Modify [Dump file:] in the [Write debugging information] group box.

e.g. Write the debug information in D drive with the file name "MEMORY.DMP".

D:\MEMORY.DMP

IMPORTANT:

Windows Server 2008 64-bit (x64) Edition

- To specify "Complete Memory Dump" to write the debug information is recommended. If the mounted memory size is larger than 2GB, "Complete Memory Dump" cannot be specified so that specify "Kernel Memory Dump" instead.
- Specify the drive where there is a free area more than the size of "the memory capacity mounted on Express server + 300MB".
- In case the mounted memory size exceeds 2GB due to the added memory, change the write debugging information to [Kernel Memory Dump] before adding memory. The size of debugging information (memory dump) to be taken also changes due to adding memory. Verify the size of the empty space in the debugging information (memory dump) write destination drive.

Windows Server 2008 32-bit (x86) Edition

- To specify "Complete Memory Dump" to write the debug information is recommended. If the mounted memory size is larger than 2GB, "Complete Memory Dump" cannot be specified so that specify "Kernel Memory Dump" instead.
 - Specify the drive where there is a free area more than the size of "the memory capacity mounted on Express server + 300MB" (In case the memory capacity is more than 2GB, a free area of "2048+300MB" or more).
 - In case the mounted memory size exceeds 2GB due to the added memory, change the write debugging information to [Kernel Memory Dump] before adding memory. The size of debugging information (memory dump) to be taken also changes due to adding memory. Verify the size of the empty space in the debugging information (memory dump) write destination drive.
-

5. Click [Settings] on the [Performance] group box.
The [Performance Options] window appears.
6. Click [Advanced] tab on the [Performance Options] window.
7. Click [Change] on the [Virtual memory] group box.
8. Uncheck the [Automatically manage paging file size for all drives] box, and check [Custom size].

9. On the [Paging file size for each drive] box, specify as follows:
 - A value larger than the recommended size shown in [Total paging file size for all drives] for [Initial size]
 - A value larger than the [Initial size] for [Maximum size]Then click [Set].

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
 - For more information on "Recommended" value, see "About the System Partition Size" described earlier.
 - In case the memory is expanded, re-specify the paging file to suit the new memory size.
-

10. Click [OK].

The message to restart the system may appear according to the modified specification.

In such case, follow the message to restart the system.

When the system is Windows Server 2003

Follow the procedure below to specify.

1. Select [Control Panel] and click [System].
The [System Properties] dialog box appears.
2. Select [Advanced] tab.
3. Click [Settings] on the [Startup and Recovery] group box.

IMPORTANT:

Windows Server 2003 x64 Editions

- To specify "Complete Memory Dump" to write the debug information is recommended.
If the mounted memory size is larger than 2GB, "Complete Memory Dump" cannot be specified so that specify "Kernel Memory Dump" instead.
- Specify the drive where there is a free area more than the size of "the memory capacity mounted on Express server + 1MB".
- In case the mounted memory size exceeds 2GB due to the added memory, change the write debugging information to [Kernel Memory Dump] before adding memory. The size of debugging information (memory dump) to be taken also changes due to adding memory. Verify the size of the empty space in the debugging information (memory dump) write destination drive.

Windows Server 2003

- To specify "Complete Memory Dump" to write the debug information is recommended.
If the mounted memory size is larger than 2GB, "Complete Memory Dump" cannot be specified so that specify "Kernel Memory Dump" instead.
 - Specify the drive where there is a free area more than the size of "the memory capacity mounted on Express server + 12MB" (In case the memory capacity is more than 2GB, a free area of "2048+12MB" or more).
 - In case the mounted memory size exceeds 2GB due to the added memory, change the write debugging information to [Kernel Memory Dump] before adding memory. The size of debugging information (memory dump) to be taken also changes due to adding memory. Verify the size of the empty space in the debugging information (memory dump) write destination drive.
-

4. Specify "Complete memory dump" and modify [Dump file:] in the [Write debugging information] group box.
e.g. Write the debug information in D drive write the file name "MEMORY.DMP".
D:\MEMORY.DMP
5. Click [Settings] on the [Performance] group box.
The [Performance Options] window appears.
6. Click [Advanced] tab on the [Performance Options] window.
7. Click [Change] on the [Virtual memory] group box.
8. Modify [Initial Size] in the [Paging file size for selected drive] box to the value larger than the value of [Recommended] in the [Total paging file size for all drives], and click [Set].

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
 - For more information on "Recommended" value, see "About the System Partition Size" described earlier.
 - In case the memory is expanded, re-specify the paging file to suit the new memory size.
-

9. Click [OK].

The message to restart the system may appear according to the modified specification. In such case, follow the message to restart the system.

How to Create a User-mode Process Dump File

When the system is Windows Server 2008 R2

"User-mode Process Dump" is the file that records information when any application error occurs.

When any application error occurs, do not close the pop-up window that notifies the error, and then collect a dump using following process.

1. Right-click a blank part of the taskbar and click [Task Manager], or press Ctrl + Shift + Esc to start [Task Manager].
2. Click [Processes] tab.
3. Right-click on process name that you want to collect dump, and then click [Create Dump File].
4. The dump file is stored in following directory.

C:\Users\<<User Name>\AppData\Local\Temp

NOTE: The folder may be treated as hidden folder. If the folder does not appear, run Explorer and select [Organize] - [Folder and search options] - [View], and check to [Show hidden files, folders, and drives].

When the User-mode Process Dump is created, pick up the file from the directory described in Step 4.

Refer to Knowledge Base of Microsoft web-site for more information about the User-mode Process Dump file collection.

"How to create a user-mode process dump file in Windows Server 2008"

<http://support.microsoft.com/kb/949180/en-us>

NOTE: For Windows Server 2008, Dr. Watson is replaced by [Problem Reports and Solutions], therefore, you can not collect the Crash Dump file by existing Dr. Watson.

The above process provides you the information same level as the Crash Dump file.

When the system is Windows Server 2008

"User-mode Process Dump" is the file that records information when any application error occurs.

When any application error occurs, do not close the pop-up window that notifies the error, and then collect a dump using following process.

1. Right-click a blank part of the taskbar and click [Task Manager], or press Ctrl + Shift + Esc to start [Task Manager].
2. Click [Processes] tab.
3. Right-click on process name that you want to collect dump, and then click [Create Dump File].
4. The dump file is stored in following directory.

C:\Users\\AppData\Local\Temp

NOTE: The folder may be treated as hidden folder. If the folder does not appear, run Explorer and select [Tools] - [Folder Options...] - [View], and check to [Show hidden files and folders].

When the User-mode Process Dump is created, pick up the file from the directory described in Step 4.

Refer to Knowledge Base of Microsoft web-site for more information about the User-mode Process Dump file collection.

"How to create a user-mode process dump file in Windows Server 2008"

<http://support.microsoft.com/kb/949180/en-us>

NOTE: For Windows Server 2008, Dr. Watson is replaced by [Problem Reports and Solutions], therefore, you can not collect the Crash Dump file by existing Dr. Watson.

The above process provides you the information same level as the Crash Dump file.

When the system is Windows Server 2003 (Dr. Watson)

Dr. Watson is a debugger for application errors. If any application error is detected, Dr. Watson diagnoses the server and logs diagnostic information (log). Follow the procedure below and specify Dr. Watson to collect diagnostic information.

1. Click [Run] on Start menu.
2. Type "drwtsn32.exe" in the [Open] box, and click [OK].
The [Dr. Watson for Windows] dialog box appears.
3. Specify the location to store the diagnostic information in the [Log File Path] box.
The diagnostic information will be stored with the file name "DRWTSN32.LOG".

NOTE: You can not specify network 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. Select [Full] radio button from [Crash Dump Type].
6. Check the following check box on the [Options] box.
 - Dump Symbol Table
 - Dump All Thread Contexts
 - Append TO Existing Log File
 - Create Crash Dump File

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

7. Click [OK].

Network Monitor

Utilizing Network Monitor helps you to investigate and manage with network trouble.

Network Monitor Setup (Windows Server 2008 R2 / Windows Server 2008)

Microsoft Network Monitor allows you to examine and troubleshoot network problems.

NOTE: Windows Server 2008 R2 / Windows Server 2008 does not provide Network Monitor.

To use Network Monitor on Windows Server 2008 R2 / Windows Server 2008, install Network Monitor by following the steps below.

1. Download Microsoft Network Monitor from the following web site:
<http://support.microsoft.com/kb/933741/en-us>

2. Run the downloaded file to start the installer.

Follow the on-screen instructions to install Network Monitor.

NOTE: If a Security Alert appears, click [Run]. Select [Complete] for a setup format.

3. Network Monitor is installed.

NOTE: To remove Network Monitor, go to [Programs and Features].

Network Trace Capture (Windows Server 2008 R2 / Windows Server 2008)

1. On the Start menu, start Microsoft Network Monitor.
2. On [Start Page], select [Create a new capture tab...] or select [New] in the [File] menu, and click [Capture...].

A new tab for capturing a network trace is created.

3. On the [Select Networks] window, select a network you want to capture a trace.
4. On the [Capture] menu, click [Start] to start capturing a network trace.
5. On the [Capture] menu, click [Stop] to stop capturing a network trace.
6. On the [File] menu, select [Save As...].

The [Save As] window appears. Select [All captured frames] from [Frame selection], and enter the names of a folder and a file.

NOTE: The default folder name is:
C:\Users\\Documents\Network Monitor 3\Captures

7. Click **Save** to create the file in the folder selected in step 6.

Network Monitor (Windows Server 2003)

To utilize Network Monitor, you need to restart the system after the installation has completed, so we recommend to install Network Monitor before any network trouble may occur.

1. Point to [Settings] from Start menu and click [Control Panel].
The [Control Panel] dialog box appears.
2. Double-click [Add or Remove Programs].
The [Add or Remove Programs] dialog box appears.
3. Click [Add/Remove Windows Component].
The [Windows Components Wizard] dialog box appears.
4. Click [Management and Monitoring Tools] and then click [Details].
The [Management and Monitoring Tools] dialog appears.
5. Click to select the [Network Monitor Tools] check box, and then click [OK].
6. The [Windows Components Wizard] dialog box appears again, so click [Next].
7. If the setup asks to install the disk, insert the OS CD-ROM into optical disk drive and click [OK].
8. Click [Finish] in the [Windows Component Wizard] dialog box.
9. Close the [Add or Remove Programs] dialog box.
10. Close the [Control Panel] dialog box.

To start Network Monitor, point to [Program] → [Administrative Tools] and click [Network Monitor]. For information on how to operate Network Monitor, refer to Online Help.

Re-installing the Operation System if Multiple Logical Drives Exist

Before Re-installing the Operation System

Be sure to make backup copies before re-installing the operation system just in case.

Re-installing the Operation System

1. Start the clean installation following the procedure described in this manual.
2. Specify the partition in which you want to install the operating system when the following message appears:

<Windows Server 2008 R2/Windows Server 2008>

Where do you want to install Windows?

<Windows Server 2003>

The following list shows the existing partitions and unpartitioned space on this computer.
Use the UP and DOWN ARROW keys to select an item in the list.

* Cannot modify the drive letter of your system or boot volume. Confirm the proper drive letter is assigned and then, continue the setup.

IMPORTANT: Windows Server 2008 R2/Windows Server 2008

When you install the Windows OS in the environment with which several hard disk drives are connected, more than one hard disk drives are displayed as installation target. In this case, displayed sequence or number may not correspond with the sequence of the hard disk drive that connected with drive bay.

Distinguish the hard disk drive for installation by displayed disk capacity or the size of partitions. If you select wrong hard disk drive, the existing contents may be deleted unexpectedly. Pay enough attention when you select the hard disk drive for installation.

Refer to following Microsoft web-site for more details.
<http://support.microsoft.com/kb/937251/en-us>

3. Continue the clean installation again following the procedure described in this manual.
4. The drive letter of the re-installed system may differ from the one of the previous system. If you need to modify the drive letter, modify it according to the "Procedure for Modifying the Drive Letter".

Procedure for Modifying the Drive Letter

Be careful that the drive letter of the system or boot volume cannot be modified with the following procedure.

<Windows Server 2008 R2 / Windows Server 2008>

1. Click Start menu, right-click [Computer], and specify [Manage] to start [Server Manager].
2. Specify the [Storage] - [Disk Management] in the left side of the window.
3. Right-click the volume you want to modify the drive letter and specify the [Change Drive Letter and Paths...].
4. Click [Change...].
5. Choose the [Assign the following drive letter] and specify the drive letter you want to assign.
6. Click [OK].
7. If the following message appears, click [Yes].

Some programs that rely on drive letters might not run correctly.
Do you want to continue?

8. Close the [Server Manager].

<Windows Server 2003>

1. Click Start menu, right-click [My Computer], and specify [Manage] to start [Computer Management].
2. Specify the [Disk Management] in the left side of the window.
3. Right-click the volume you want to modify the drive letter and specify the [Change Drive Letter and Paths...].
4. Click [Change...].
5. Choose the [Assign the following drive letter] and specify the drive letter you want to assign.
6. Click [OK].
7. If the following message appears, click [Yes].

Changing the drive letter of a volume might cause programs to no longer run.
Are you sure you want to change this drive letter?

8. Close the [Computer Management].

INSTALLING MAINTENANCE UTILITIES

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

UPDATING THE SYSTEM

IMPORTANT: If you install Windows Server 2003 CD-ROM which contains Service Pack 2 to your system, you do not have to apply Service Pack 2 again.

"Updating the System" is executed by Express Setup automatically.

Execute "Updating the System" in following cases.

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

See "Updating the System" section in Appendix D for details of update process.

MAKING BACKUP COPIES OF SYSTEM INFORMATION

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

Save the information after completing the system setup.

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

You can save the information by the following process.

- 1.** Connect Flash FDD or USB FDD to the USB connector.
- 2.** Insert the NEC EXPRESSBUILDER DVD into the optical disk drive and reboot the system.
- 3.** Select [Tool menu (Normal mode)].
- 4.** Select [English].
- 5.** Select [Maintenance Utility].
- 6.** Select [System Information Management].
- 7.** Select [Save].

Installing with the OEM-Disk for Mass Storage Device

This section explains how to setup with the OEM-Disk. You usually do not have to do as follows. If your system has any Mass storage devices, you have to set as follows depending on your system. The detailed information is provided by the manual of the Mass storage device.

Installation of Mass Storage Device not to be Supported by Express Setup

If you would like to install or re-install the OS when the system has new mass storage device not to be supported by NEC EXPRESSBUILDER, you have to set as follows.

1. Read the manual supplied with the mass storage device before setting the server.
2. If the mass storage device is RAID Controller, configure the RAID System before running the NEC EXPRESSBUILDER.
3. Boot the system from NEC EXPRESSBUILDER DVD.
4. Select [Load the optional driver into the EXPRESSBUILDER] from the Top menu, click [Next].

Setting the driver disk for the mass storage controller. Press the "Perform" button.

NOTE: By choosing this option, you can load the driver provided by CD-ROM or floppy disk to proceed with the Express Setup.

5. Perform Express Setup with the following settings.
 - (a) When "Enter RAID settings" appears, check "Skip the logical drive creation".
 - (b) Confirm [Apply OEM-Disk for mass storage device] is displayed in [Selected applications] box at "Select applications" steps.

Chapter 6

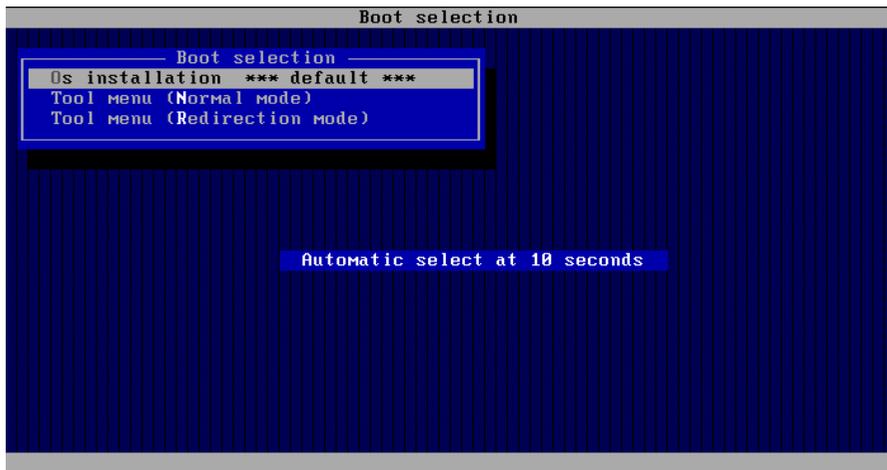
Installing and Using Utilities

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

NEC EXPRESSBUILDER

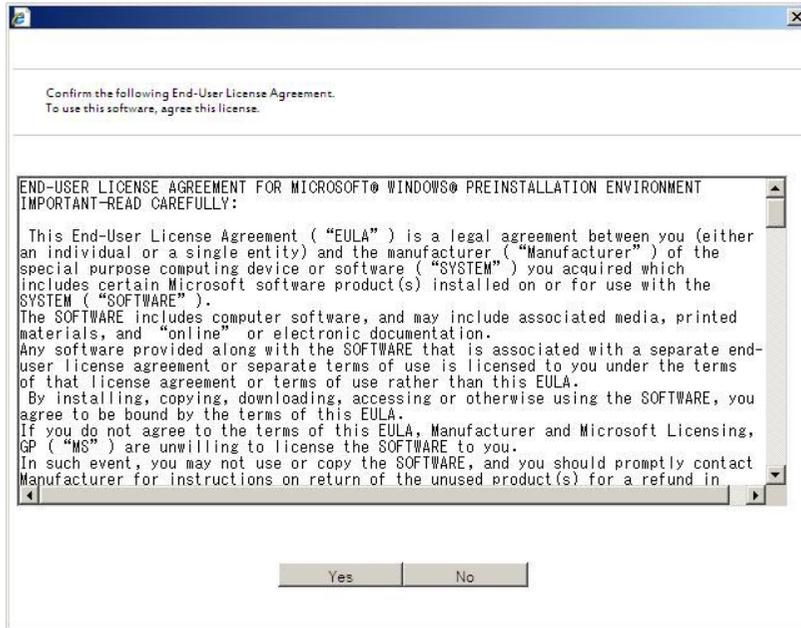
The NEC EXPRESSBUILDER helps you install the Operating system/the Management software or use the maintenance utilities.

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

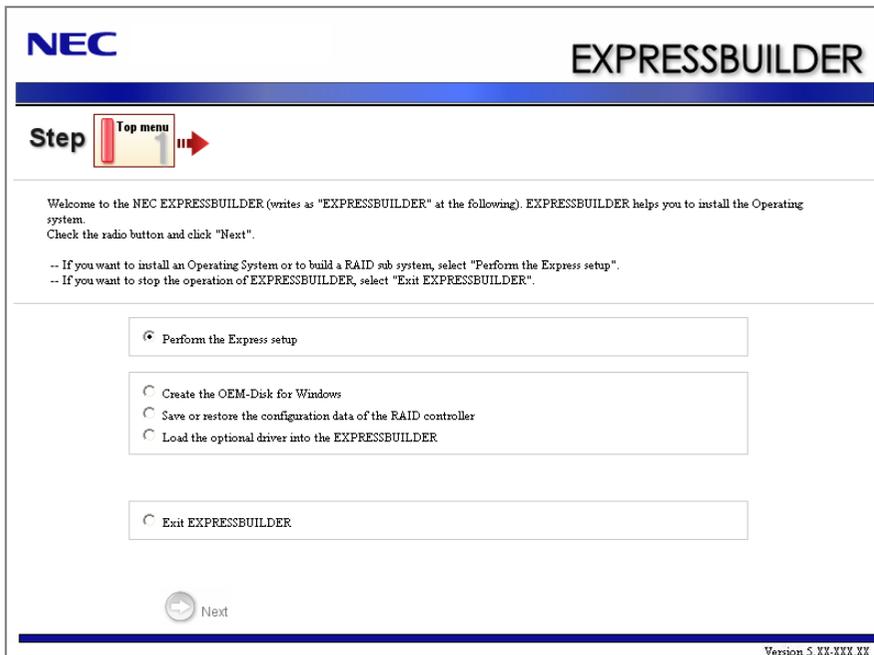


- OS installation

If you select this item, the Software License Agreement screen of Windows PE appears.



If you click [Yes], the Top menu appears.



IMPORTANT: This tool is Configuration Tool that built on Windows PE 3.0 technology.
Pay attention to the automatic reboot that occurs after 72 hours from start.

You can use the Express Setup (see Chapter 5) or the following functions from this menu.

- Create the OEM-Disk

You can create the Windows OEM-Disk to use at the Windows manual setup.

- Load the driver

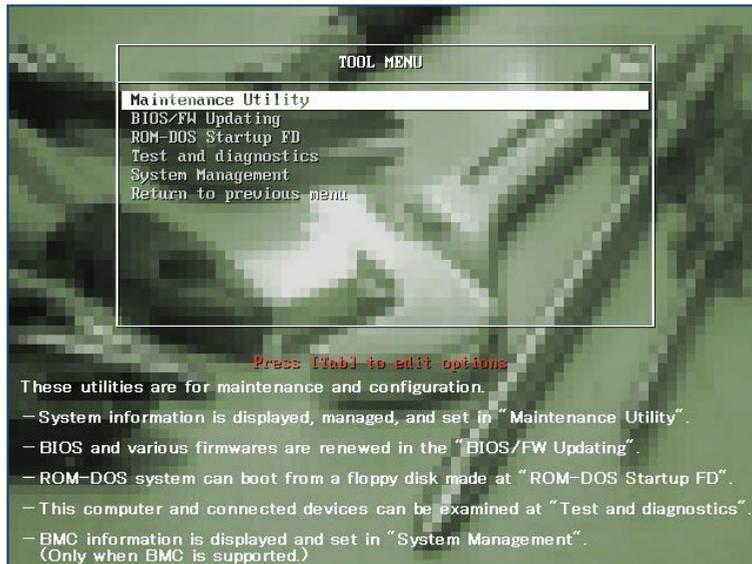
This function is not usually used. If you add the new device to the server, this function may be used. (See Chapter 5.)

- Save/load the RAID configuration data

You can save the RAID configuration data stored in RAID Controller, or restore it.

- Tool menu (Normal mode)

If you select this item, the Tool menu appears.

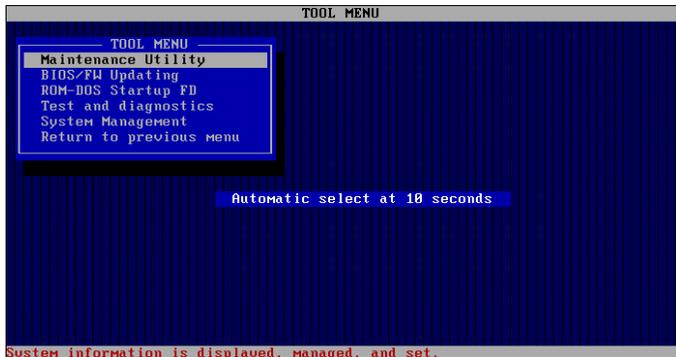


You can use the below functions for maintenance.

- Maintenance Utility
The Maintenance Utility is usually used by the service representative. (See Chapter 6.)
- BIOS/FW Updating
You can update the system BIOS by using the Flash FDD or USB FDD.
- ROM-DOS Startup FD
The ROM-DOS Startup FD is used for starting the ROM-DOS system.
- Test and diagnostics
This function allows you to diagnose this computer. (See Chapter 7.)
- System Management
You can configure the parameters of BMC (Baseboard Management Controller).
This function is not supported in this server.

■ Tool menu (Redirection mode)

If you want to operate this computer via the BIOS redirection (the console-less function), select this item.

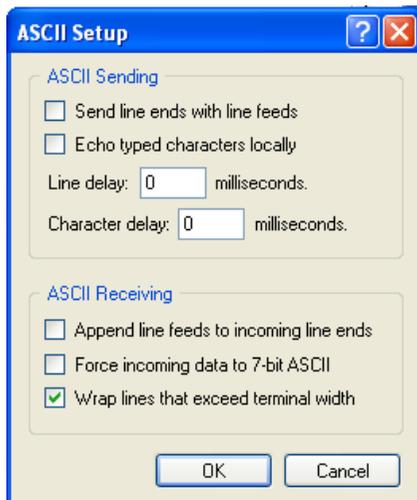


The menu's functions are the same as the "Tool menu (Normal mode)".

IMPORTANT: To use the Windows HyperTerminal Emulation program on serial console, setup as shown below is required.

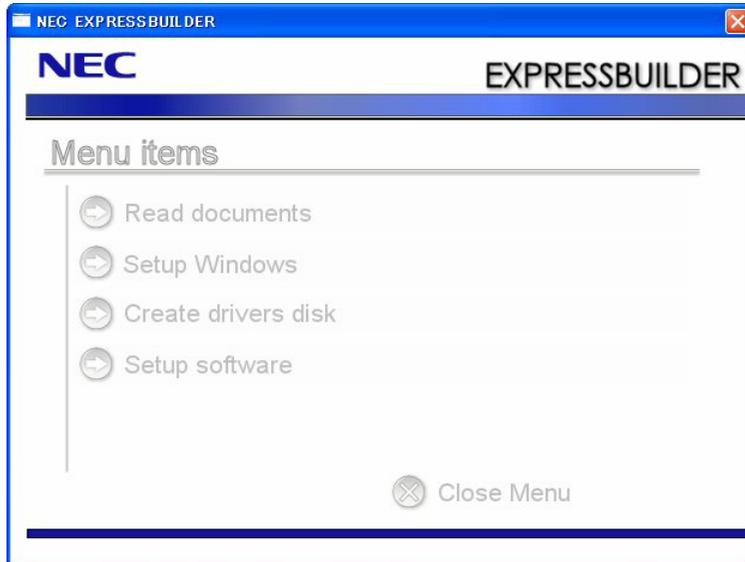
<Example: On Windows XP>

1. From the menu bar of HyperTerminal, select [File] - [Properties].
2. In the [Properties] dialog box, select [Settings] - [ASCII Setup]. Remove a checkmark from "Wrap lines that exceed terminal width" checkbox.



Autorun Menu

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



This menu is used to,

- Read the User's Guide or the other documents,
- Update the server system (Windows drivers), and
- Install the management software.

NOTES:

- This menu requires Microsoft Windows XP, Vista or Windows Server 2003 (or later).
 - Some documents are provided in PDF format. Use the Adobe Reader to view or print these documents.
-

If the menu does not appear, select "My computer" by using the Explorer, and double-click the icon of the optical disk drive that contains the NEC EXPRESSBUILDER DVD.

Some menu items are grayed-out when the logon user does not have the authority of the administrator or the menu item is not available for your system.

To use the menu,

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

PARAMETER FILE CREATOR

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

If you use the Parameter file created by the Express Setup and Parameter File Creator to operate the setup, you can setup from the installation of OS to several utilities automatically except for a few key input to confirm the specification. Also, you can install the system with the same specification as before when re-installing the system. We recommend you to create [Parameter file] to setup the servers from NEC EXPRESSBUILDER.

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

IMPORTANT:

- You can not create [Parameter file] for Windows Server 2003 x64 Editions.
 - The setup using a parameter file saved in the Flash FDD is not supported.
-

NOTE: You can install Windows Server 2008 R2/Windows Server 2008/Windows Server 2003 without [Parameter file]. Also, you can modify/newly create [Parameter file] during the setup with NEC EXPRESSBUILDER.

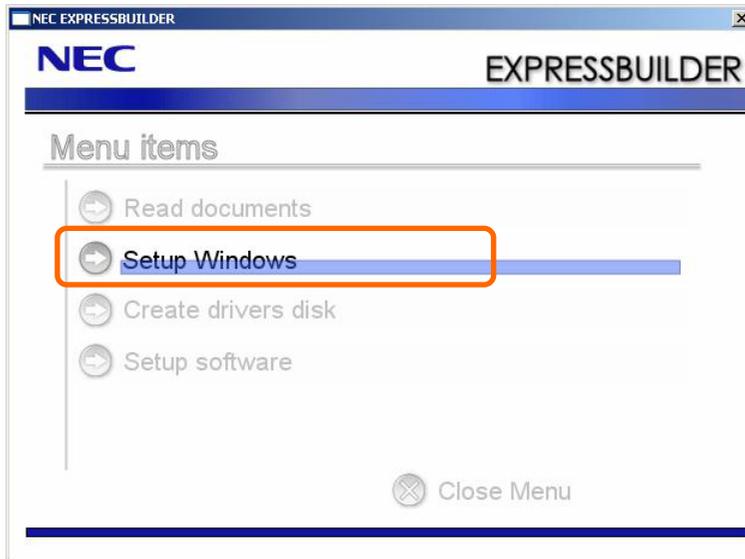
Parameter File

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

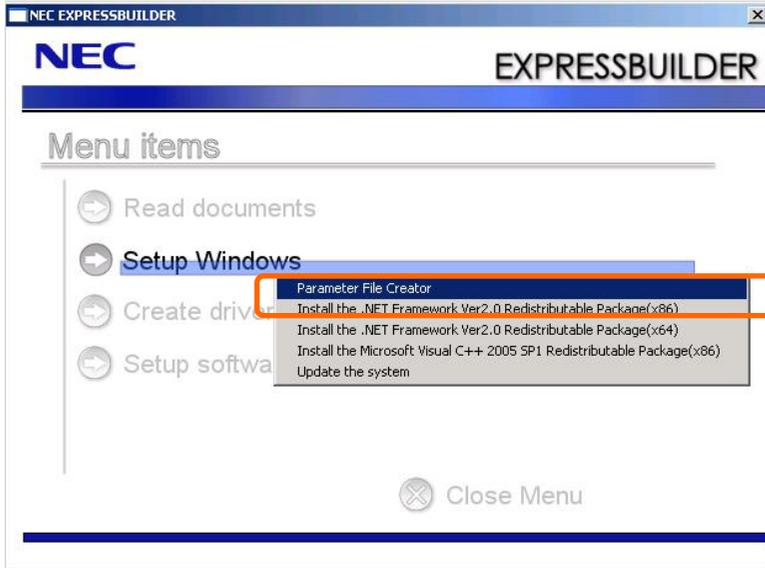
Follow the procedure below.

IMPORTANT: Do not remove NEC EXPRESSBUILDER DVD from drive during a parameter file creation.

1. Start the OS.
2. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive.
The menu will appear.
3. Right-click on the screen or left-click [Setup Windows]. The menu will appear.



4. Click [Parameter File Creator].

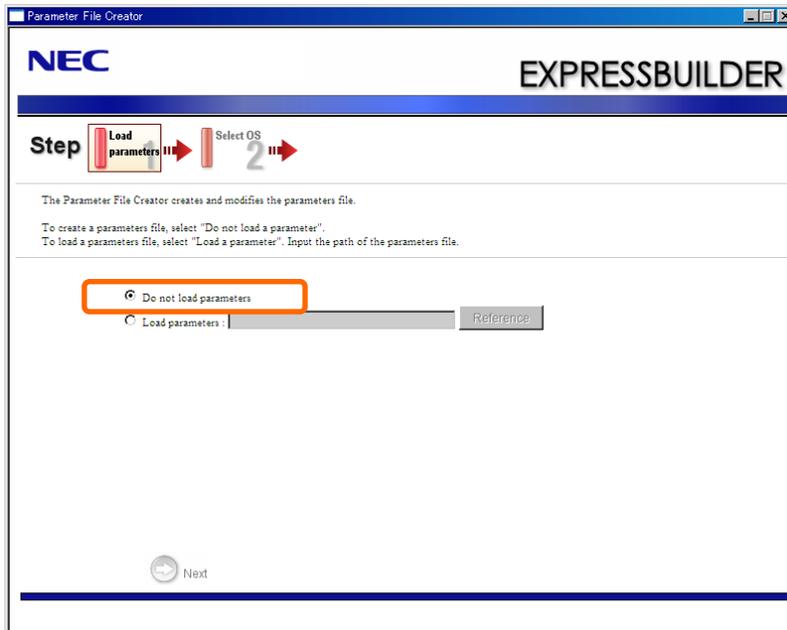


Parameter File Creator will appear.



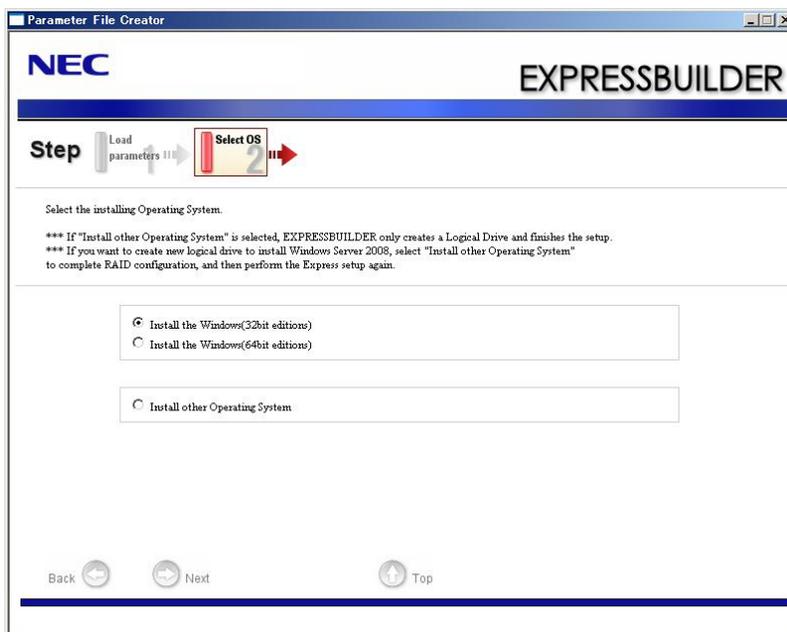
5. [Load Parameters] step is displayed.

Select [Do not load parameters] from the menu, click [Next].



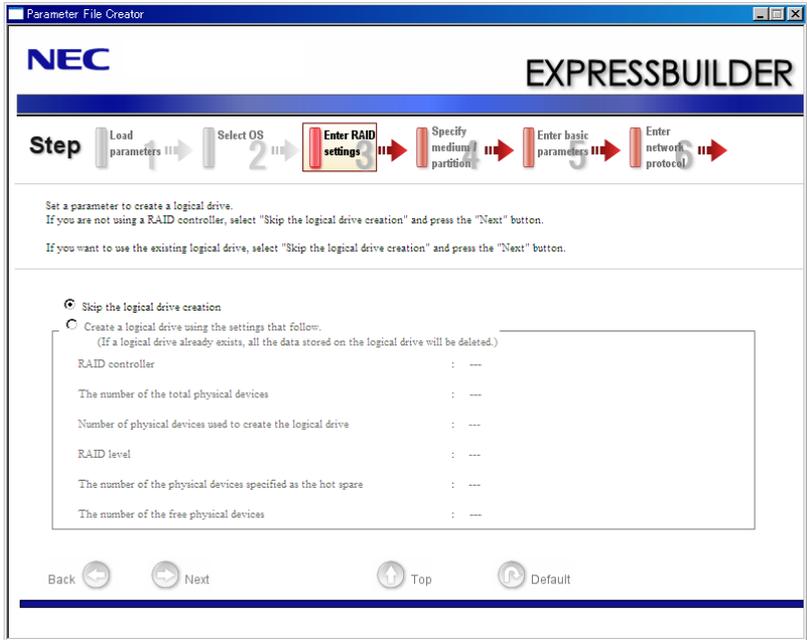
6. Select the installing Operating System.

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



7. Enter the setting of a logical drive.

[Enter RAID setting] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].



IMPORTANT: At "The number of the total physical devices", Parameter File Creator displays upper limit that the RAID Controller can support.

The total of "The number of physical devices used to create the logical drive" and "The number of the physical devices specified as the hot spare" must not exceed "The number of the total physical devices" which connected to the target system.

NOTE: You can use only the physical devices that have same model number to configure logical drive.

8. Specify the installing medium and the Windows system partition.

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

[Windows Server 2008 R2]

Parameter File Creator

NEC EXPRESSBUILDER

Step 1 Load parameters 2 Select OS 3 Enter RAID settings 4 Specify medium / partition 5 Enter basic parameters 6 Enter network protocol

Specify the installing medium and the Windows system partition.
*** Refer to the User's guide about the Service Pack installation.
If "Use existing partitions" is selected, EXPRESSBUILDER installs the Operating System to the 1st partition.

Medium selection

Windows family/edition : Windows Server 2008 R2 Standard(Full Installation)

Language : English

Install the Service Pack

Keyboard layout : Default

Time zone : (GMT-08:00) Pacific Time (US & Canada)

Windows system drive settings

Use existing partitions (only the 1st partition is formatted and its data is erased)

Create a new partition (all of the data in the disk is erased)

Use disk space as large as possible

Specify the size of the system partition : 33000 (MB)
(13,480MB - 2,097,144MB) *1GB=1,024MB

Back Next Top Default

[Windows Server 2008]

Parameter File Creator

NEC EXPRESSBUILDER

Step 1 Load parameters 2 Select OS 3 Enter RAID settings 4 Specify medium / partition 5 Enter basic parameters 6 Enter network protocol

Specify the installing medium and the Windows system partition.
*** Refer to the User's guide about the Service Pack installation.
If "Use existing partitions" is selected, EXPRESSBUILDER installs the Operating System to the 1st partition.

Medium selection

Windows family/edition : Windows Server 2008 Standard(Full Installation)

Language : English

Install the Service Pack

Keyboard layout : Default

Time zone : (GMT-08:00) Pacific Time (US & Canada)

Windows system drive settings

Use existing partitions (only the 1st partition is formatted and its data is erased)

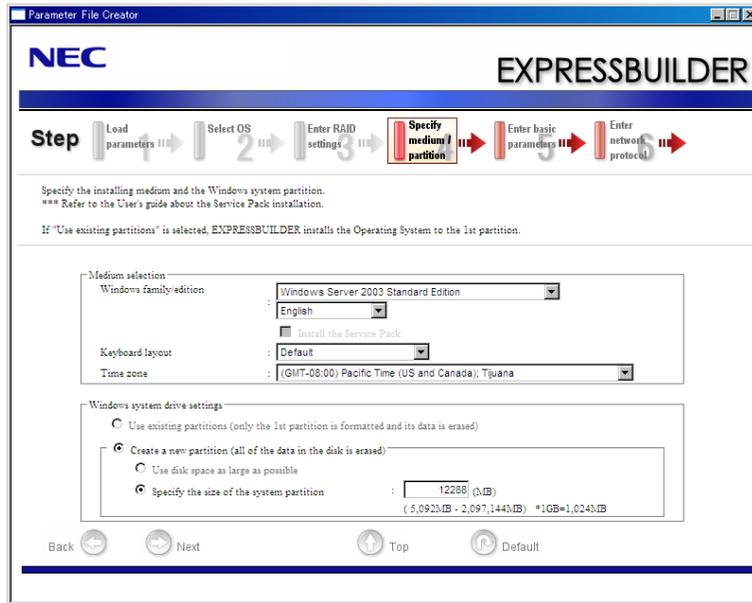
Create a new partition (all of the data in the disk is erased)

Use disk space as large as possible

Specify the size of the system partition : 40960 (GB)
(8,180GB - 2,097,144GB) *1GB=1,024GB

Back Next Top Default

[Windows Server 2003]



IMPORTANT:

- If you install Windows Server 2003 R2 and Service Pack, apply Windows Server 2003 R2 DISC 2 after Express Setup completion, and then install Service Pack by "Updating the system".
- About partition size
 - Specify the partition size larger than required minimum size for OS installation.
 - Do not specify larger partition size than the capacity of connected hard disk drive.
 - You can not specify a logical drive larger than 2,097,144MB at RAID system.
- If you select "Create a new partition" at "Windows system drive settings", the contents of the hard disk will be all deleted.
- If "Use existing partitions" is selected when you operate Windows Server 2008 R2, NEC EXPRESSBUILDER installs the Operating System to the Windows partition (The Boot partition (if it exists) and the Windows partition are deleted).
The data in the other partition is kept if the system has two or more partitions. (See the figure below.)

Boot Partition Deleted	Windows Partition Deleted	User Data Partition Retained
------------------------------	---------------------------------	------------------------------------

- If "Use existing partitions" is selected when you operate Windows Server 2008 or Windows Server 2003, NEC EXPRESSBUILDER installs the Operating System to the 1st partition (1st partition is deleted). The data in the other partition is kept if the system has two or more partitions. (See the figure below.)

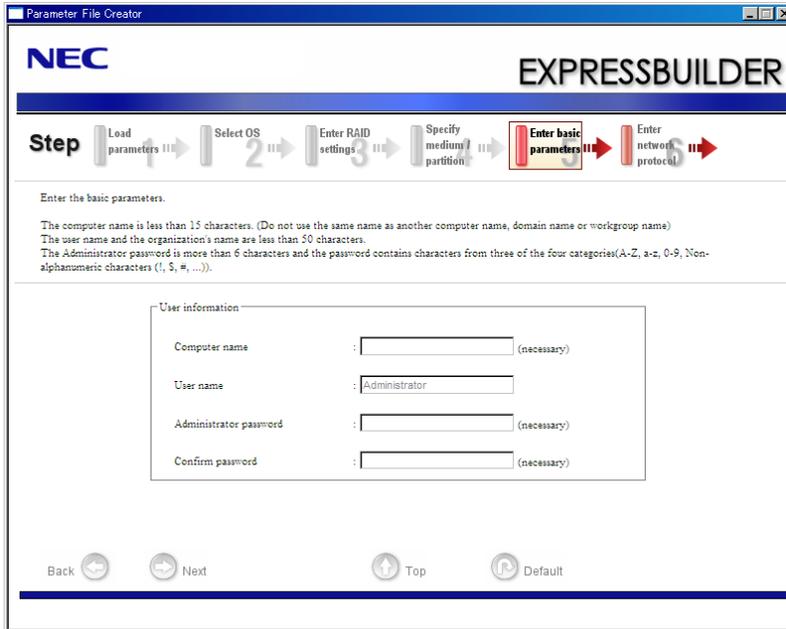
First Partition Deleted	Second Partition Retained	Third Partition Retained
-------------------------------	---------------------------------	--------------------------------

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

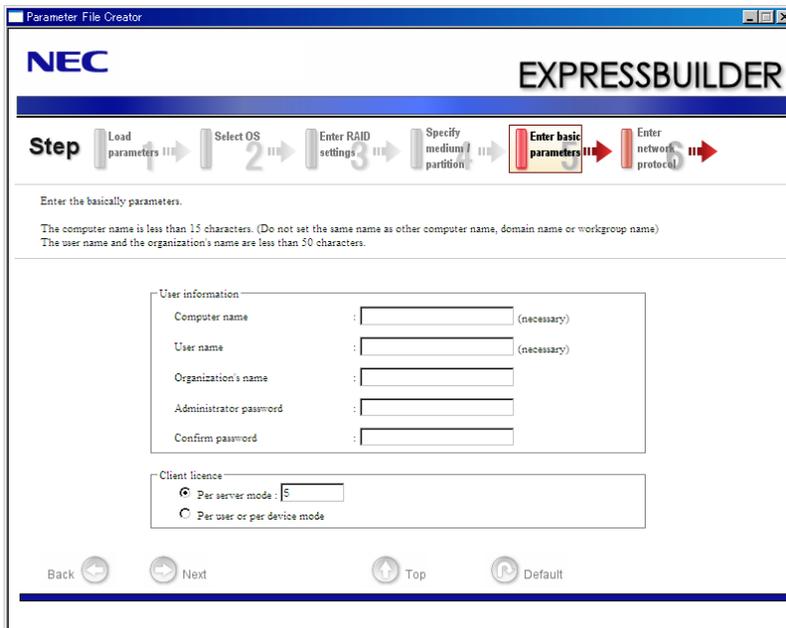
9. Enter the user information and client license mode.

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

[Windows Server 2008 R2/Windows Server 2008]



[Windows Server 2003]

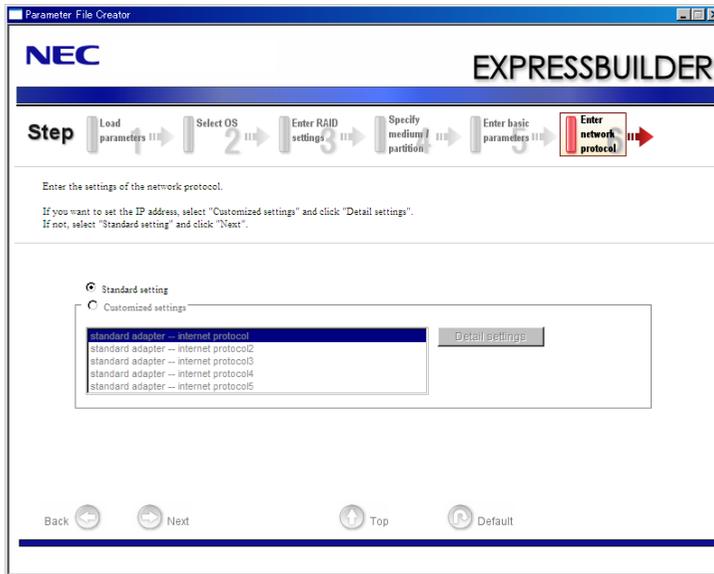


IMPORTANT: Computer name and User name are required parameters.

NOTE: Even if you do not input value into "Administrator password", "Confirm password", "●●●●●" is displayed.

10. Enter the setting of the network protocol.

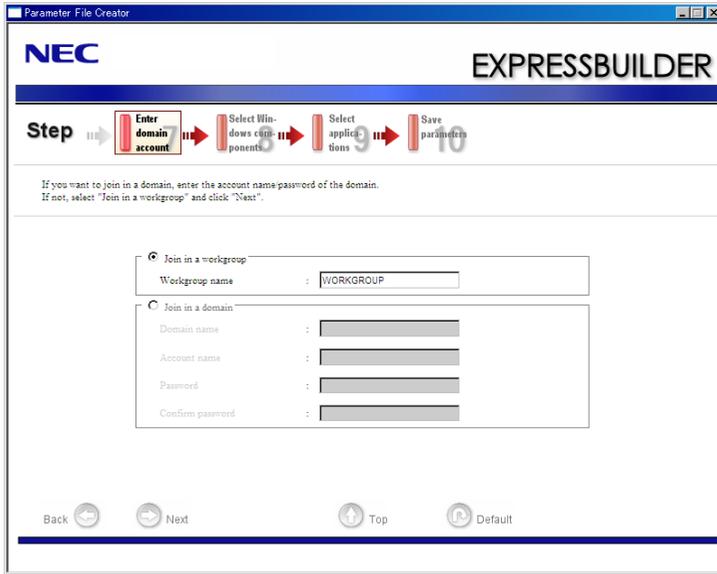
[Enter network protocol] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].



NOTE: The order of entry in custom setting may differ from the numbering of LAN port.

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

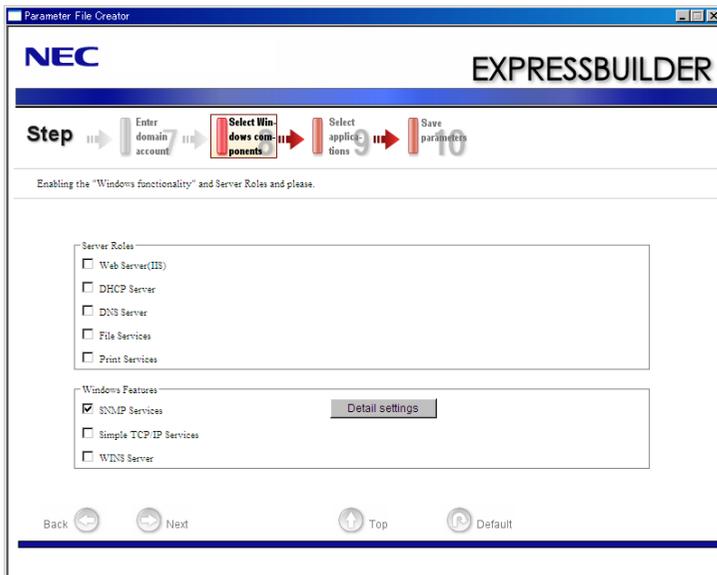
[Enter domain account] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].



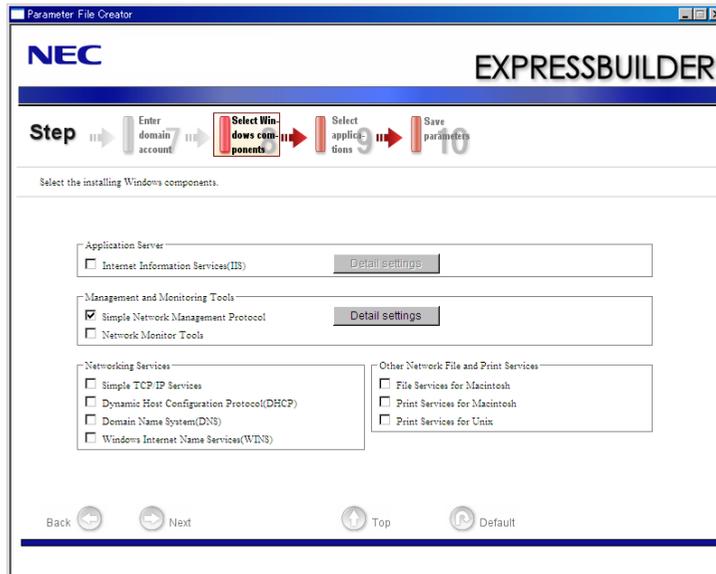
12. Select the installing components.

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

[Windows Server 2008 R2/Windows Server 2008]



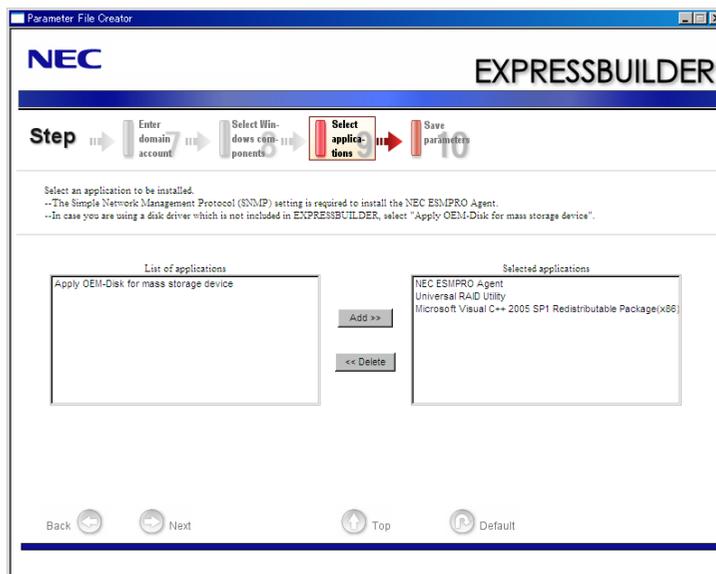
[Windows Server 2003]



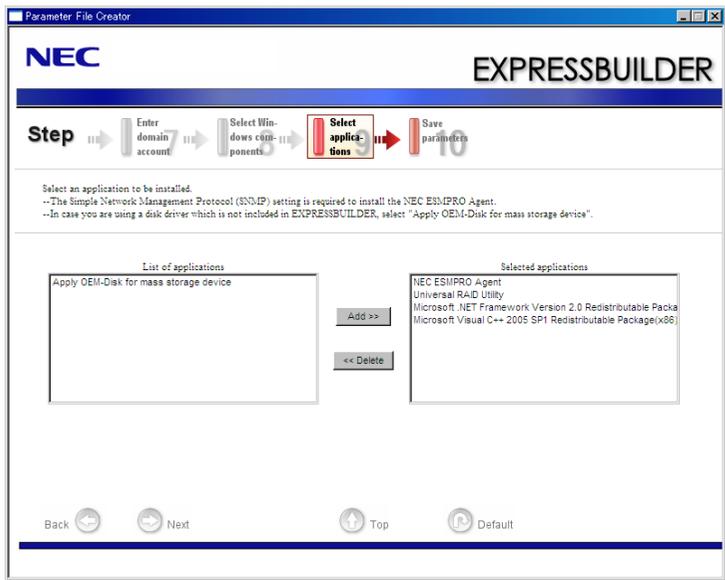
13. Select the installing applications.

[Select applications] steps are displayed. Confirm the parameters, modify if necessary, and then click [Next].

[Windows Server 2008 R2/Windows Server 2008]

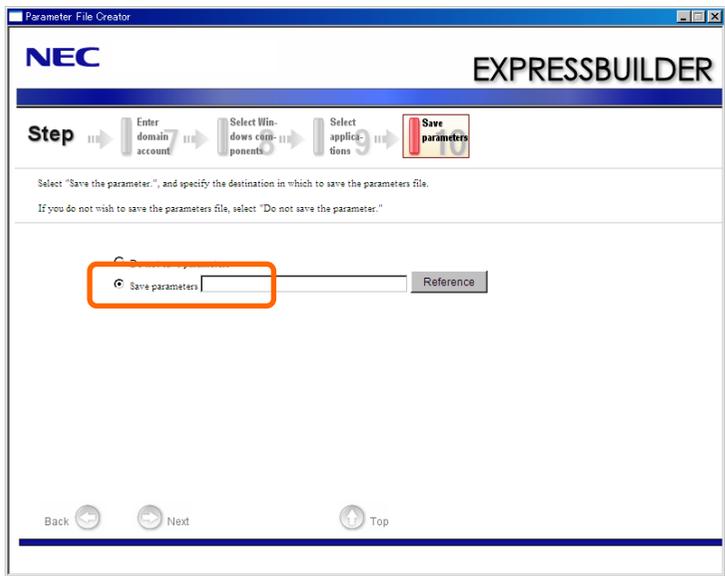


[Windows Server 2003]



14. Save the parameters.

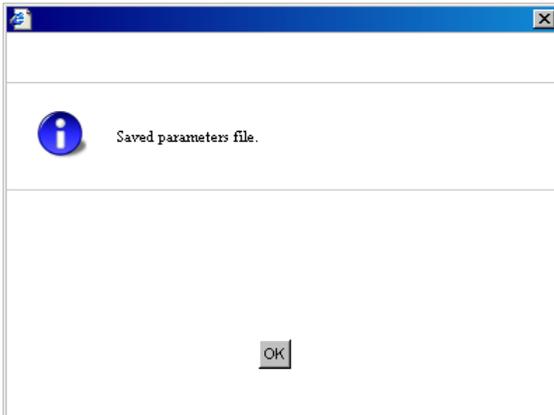
[Save parameters] steps are displayed.



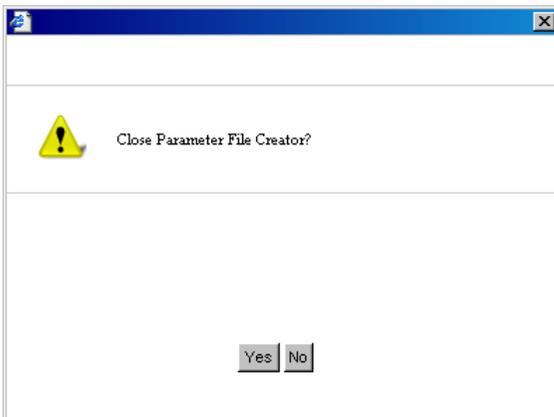
If you want to save the parameters, set the free formatted floppy disk.

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

If not, select [Do not save parameters].

15. Saved to a floppy disk.

Now [the floppy disk containing the parameters file] has been created.



Click [Yes] to exit Parameter File Creator.

NOTES:

- If you modify existing information file (parameter file), click "Load Parameters" at [Load Parameters] screen. Refer to help to modify information file.
 - If you cancel operation on the way, click  at the upper-right corner of the screen.
-

NEC ESMPRO

The NEC ESMPRO lets a system administrator manage remote servers across a network. NEC ESMPRO monitors server hardware and software configurations, failures, and performance. With log data collected by NEC ESMPRO, a system administrator can track long-term and short-term performance, monitor server usage, and check server failure rates.

The administrator can use the information collected to create more efficient data routing procedures and optimize server usage.

Functions and Features

The NEC ESMPRO offers many functions and features for managing remote servers across a network. These features help the system administrator perform daily system operation, system extension, and transfer tasks. Some features of NEC ESMPRO Manager include:

- Hardware and software server configuration
 - Hardware resources mounted in servers, such as the CPU, memory, disks, RAID System, and LAN boards.
 - Software resources, such as operating system information and drivers running on each server.
- Server failures
 - On-screen real-time displays provide the system administrator with the failure type, location, cause, and suggested corrective action.
 - Failure data includes hardware failure information such as system board temperature, memory failure, crashes, and software failure information.
- Performance
 - NEC ESMPRO monitors server performance and displays server usage on the screen and displays information, such as the rate of CPU load, memory usage, disk usage, and LAN traffic. Usage threshold values can help the system administrator monitor and prevent server overloads.

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

NEC ESMPRO Agent Extension

The NEC ESMPRO Agent Extension is software for the remote management of this server.

See the online documents for details on the functions and installation of the NEC ESMPRO Agent Extension.

NEC ExpressUpdate Agent

The NEC ExpressUpdate Agent enables you to control the version of the firmware and software that are installed on the server.

Using the NEC ESMPRO Manager, you can download update packages automatically and install them simply without terminating the system.

Refer to "Installation Manual" in the NEC EXPRESSBUILDER for more information about an installation and functions of the NEC ExpressUpdate Agent.

IMPORTANT: To get the information of the update package which does not support NEC ExpressUpdate, please refer to the web site below.

<http://www.nec.com/global/prod/express/index.html>

Universal RAID Utility

Universal RAID Utility is an application to manage or monitor the following RAID Controllers.

- N8103-129 RAID Controller (256 MB, RAID0/1)
- N8103-130 RAID Controller (256 MB, RAID0/1/5/6)
- N8103-134 RAID Controller (512 MB, RAID0/1/5/6)
- N8103-135 RAID Controller (512 MB, RAID0/1/5/6)
- Onboard RAID Controller (LSI Embedded MegaRAID™)

Before attempting to operate Universal RAID Utility, read the "Universal RAID Utility Ver 2.3 User's Guide" contained in NEC EXPRESSBUILDER DVD. The manual explains the installation procedure and notes on operating Universal RAID Utility.

Setup with Express Setup

You can install Universal RAID Utility with Express Setup contained in NEC EXPRESSBUILDER DVD. When you start the Express Setup, a dialog to specify an application appears. Select [Universal RAID Utility] on the dialog.

Manual Setup

You can start the setup program of Universal RAID Utility from [Autorun Menu].

Click [Setup Software] → [Universal RAID Utility] in [Autorun Menu].

You need to install the following software.

- Microsoft .NET Framework 2.0 or later
- The Runtime component of the Microsoft Visual C++ 2005 SP1

You can install these software from [Autorun Menu] too.

Click [Setup Windows] → [Install the .NET Framework Ver 2.0 Redistributable Package (x86)] (If CPU architecture is x64, [Install the .NET Framework Ver2.0 Redistributable Package (x64)]) in [Autorun Menu] for the setup of Microsoft.NET Framework 2.0.

Click [Setup Windows] → [Install the Microsoft Visual C++ 2005 SP1 Redistributable Package(x86)] (Use the x86 package whatever the CPU architecture may be.) for the setup of the Runtime component of the Microsoft Visual C++ 2005 SP1.

- Microsoft .NET Framework

To use the RAID Viewer and Log Viewer, Microsoft .NET Framework Version 2.0 or higher is required.

Windows Server 2008 and Windows Server 2008 R2, Windows Vista, Windows 7 include .NET Framework Version 2.0 or higher. Therefore, you do not need to install .NET Framework in case of using them.

- Runtime component of Microsoft Visual C++ 2005 SP1 library

To use the RAID Viewer, the runtime component of the Microsoft Visual C++ 2005 SP1 library is required.

Windows Server 2008 and Windows Server 2008 R2, Windows Vista SP1 or later, Windows 7 include the runtime component of the Microsoft Visual C++ 2005 SP1 library. Therefore, you do not need to install the runtime component of the Microsoft Visual C++ 2005 SP1 library in case of using them as operating system.

Management of RAID System using NEC ESMPRO Manager

Using NEC ESMPRO Manager (Ver. 5.2 or later) allows you to view, monitor, and operate the RAID System managed by the Universal RAID Utility. This feature is available on Windows system only.

See the instruction of NEC ESMPRO Manager about system requirements and how to use.

Creating Logical Drive of RAID 6

Please use WebBIOS when you create the Logical Drive of RAID 6 by using three Physical Devices. Universal RAID Utility cannot create the Logical Drive of RAID 6 by using three Physical Devices.

NEC PRODUCT INFO COLLECTION UTILITY

The NEC Product Info Collection Utility is used to collect various system configuration and log information for maintenance or troubleshooting purpose of the server.

This utility can be installed from NEC EXPRESSBUILDER DVD.

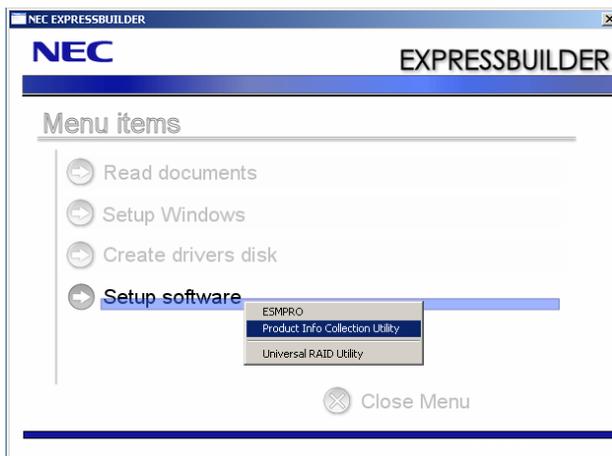
NOTE: Supported Operating Systems of this utility is as follows.

- Windows Server 2003
 - Windows Server 2003 x64 Editions
 - Windows Server 2008
-

Installation

You can install this utility according to the following procedure.

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



IMPORTANT:

- Please log-in the system in account with the administrator authority.
 - 2.5GB or more free space is required for the installation drive.
-

Using Utility

Execute `\stdclct\collect.exe` in the installation folder of this utility.

The log folder is made in the above-mentioned folder, and various information on this device is stored in the data compressed file (zip form).

Uninstallation

Except for Server Core

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

For Server Core

Enter the following command from the command prompt.

```
Wmic product where name="Product Info Collection Utility" call uninstall
```

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Chapter 7

Maintenance

This chapter describes the daily maintenance of the server and precautions when relocating or storing the server.

MAKING BACKUP COPIES

NEC recommends you make backup copies of your valuable data stored in hard disk drives of the server on a regular basis. For backup storage devices suitable for the server and backup tools, consult with your service representative.

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

Also make a backup copy of the RAID System configuration data if your system is in the RAID System configuration. When your hard disk drives have been auto-rebuilt due to a failure, it is recommended to make a backup copy of the configuration data. To make a backup copy of the configuration data, use the configuration utility that is resident in the FLASH memory on the optional RAID Controller. 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 1-4 to 1-12 for details.

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

CAUTION



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

- Avoid installation in extreme temperature conditions.
- Make sure to complete board installation.

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 LED 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.

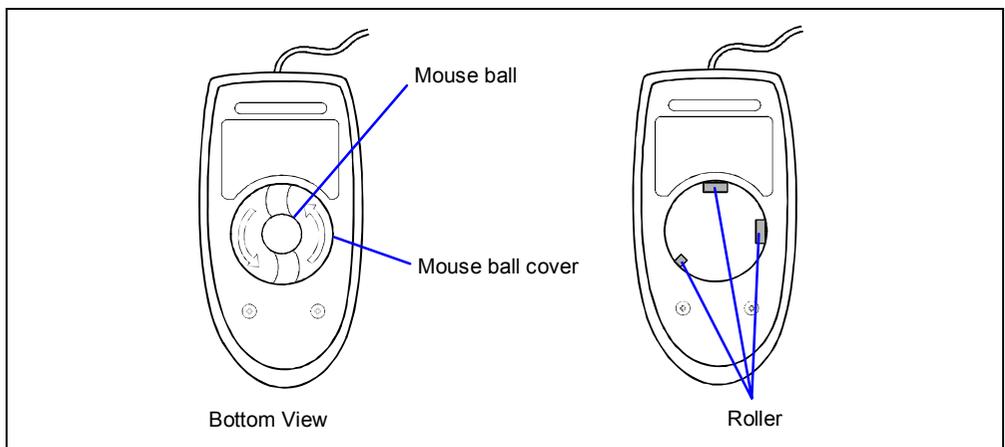
1. Turn off the server and unplug all power cables.
2. Remove the logic cover and drive cover. (See Chapter 9.)
3. Use a small brush to loosen any dust and debris on the mother board.
4. Use computer grade canned air to blow dust off components on the mother board.
5. Use a small vacuum cleaner with plastic tip to vacuum out dust and debris from the interior of the server.
6. Reinstall the covers. (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 LED 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 LED 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.



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 Disc

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

Follow the procedure below to clean the tray and disc regularly:

1. Make sure that the server is powered (the POWER/SLEEP LED is lit).
2. Press the tray Open/Close button on the front of the optical disk drive. The tray opens.
3. Hold the disc lightly and take it out from the tray.

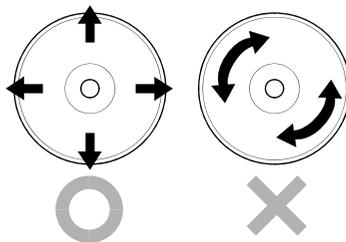
NOTE: Do not touch the signal side of the disc with your hand.

4. Wipe the tray with a dry soft cloth.

IMPORTANT: Do not wipe the lens of the optical disk drive. Doing so may damage the lens and may cause a malfunction of the drive.

5. Push on the tray front to close the tray.
6. Wipe the signal side of the disc with a dry soft cloth.

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



SYSTEM DIAGNOSTICS

The System Diagnostics runs several tests on the server.

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

Test Items

The following items are tested in system diagnostics.

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

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

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

Startup and Exit of System Diagnostics

There are two ways to diagnose the server: to use the local console (keyboard) of the server itself, and to use the management PC via serial port (remote console).

IMPORTANT: Two methods of LAN and the serial port are mentioned in "Maintenance Tools" of Chapter 8 "Troubleshooting" in the way of communicating in remote console.

Use the serial port to execute System Diagnostics with remote console. The LAN connection is not for System Diagnostics.

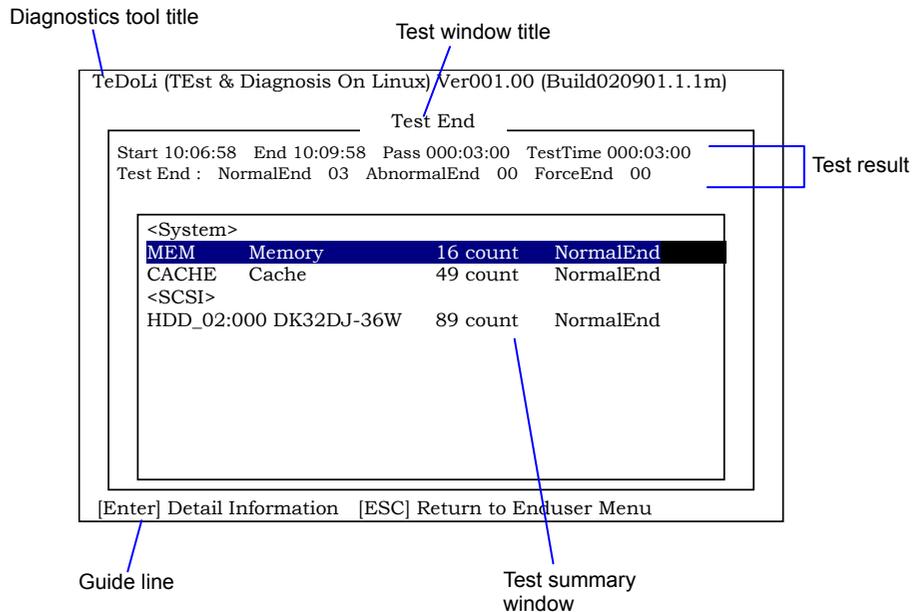
Procedures to start the diagnostics program are as follows:

1. Shutdown the OS, and power off the server. Then, unplug the power cord.
2. Disconnect all the LAN cables from the server.
3. Plug the power cord and power on the server.
4. Use the NEC EXPRESSBUILDER DVD to start the system.
5. Select [Tool menu (Normal mode)] when local console of the server is used for, or select [Tool menu (Redirection mode)] when remote console is used for.

NOTE: If the system displays the [Language selection] menu, select [English].

6. Select [Test and diagnostics].

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

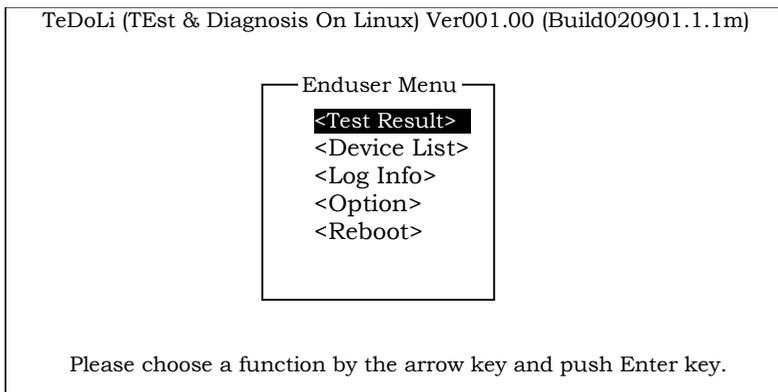


- Diagnosics tool title
Shows the name and version of the diagnostic tool.
- Test window title
Shows the progress of the diagnostics. "Test End" is displayed when the diagnostics completes.
- Test result
Shows the start, end, and elapsed time and completion status of the diagnostics.
- Guide line
Shows the details of the keys to operate window.
- Test summary window
Shows the results of each test that executed the diagnostics. Move the cursor and press the **Enter** key on the cursor line to display the details of the test.

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

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

7. Follow the guide line shown at the bottom of the screen, and press the **Esc** key.
The [Enduser Menu] below is displayed.



- <Test Result> Shows the diagnostics completion screen of the above diagnostics.
- <Device List> Shows a list of connected devices.
- <Log Info> Shows the log information of the diagnostics. Log information can be saved.
To save it, connect a FAT formatted removable media, and select <Save(F)>.
- <Option> Optional features can be used from this menu.
- <Reboot> Reboots the system.

8. Select <Reboot> in the [Enduser Menu] above.
The server restarts and the system is started from the NEC EXPRESSBUILDER.
9. Exit the NEC EXPRESSBUILDER, and remove the DVD from the optical disk drive.
10. Power off the server and unplug the power cord from the receptacle.
11. Reconnect all the LAN cables that have been disconnected in Step 2 to the server.
12. Plug in the power cord.

This completes the system diagnostics.

RELOCATING/STORING THE SERVER

Follow the procedure below to relocate or store the server:

⚠ CAUTION	
	<p>Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details.</p> <ul style="list-style-type: none">■ 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 your service representative.
 - Make sure to make a backup copy of your valuable data in the hard disk drive, if any.
 - Make sure not to apply a shock to hard disk drives to relocated the server if the contains any.
-

1. Take a media out of the server, if any.
2. Power off the server (the POWER/SLEEP LED 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.

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Chapter 8

Troubleshooting

If your server does not operate as expected, read this chapter before assuming a failure.

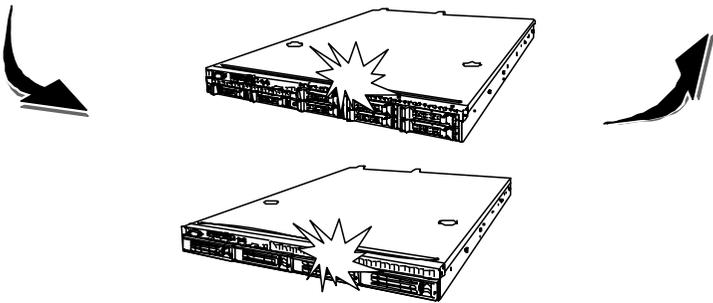
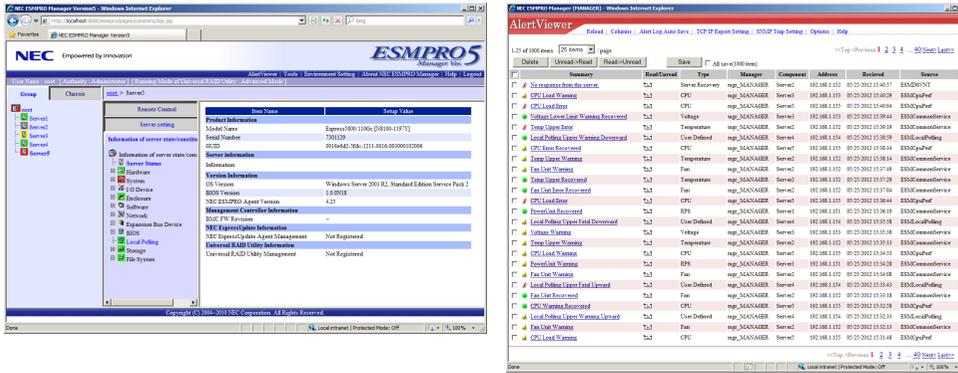
NOTE: For provision against an unexpected failure, it is recommended to install NEC ESMPRO to your computer.

SYSTEM VIEWERS

Monitor the occurrence of fault by NEC ESMPRO during the system operation.

Check that the status color of monitoring server is normal, and no warning/abnormal alert is reported.

[Example]



LED

The server has eight LEDs on the front panel, and three LEDs on the rear. The following describes LEDs on the server and their indications.

POWER LED

The POWER LED on the front panel is on (green) while the server power switch is on.

If the OS supports the power-saving mode, running the command blinks the POWER LED in green and place the server in the power-saving mode.

STATUS LED

The STATUS LED on the front panel stays lit in green when the server is in successful operation. When the STATUS LED is unlit, blinking in green or lit/blinking in amber, it indicates that the server has failed.

The following table lists indications of the STATUS LED, descriptions, and actions to take.

IMPORTANT:

- If NEC ESMPRO is installed, you can confirm the cause of a failure by referring to the error log.
 - To cycle power to the server, shut down the server from the OS and reboot it, if available. If the shutdown from the OS is not available, reset or execute the forced shut down or disconnect and connect the power cord to reboot the server.
-

STATUS LED indication	Description	Action
On (green)	The server is operating normally.	–
Blinking (green)	The server is operating with the memory in degraded state.	Identify the device in degraded state by using the BIOS setup utility "SETUP," and replace it as soon as possible.
	The server is operating with the CPU error being detected.	Check the failed CPU status by using the BIOS setup utility "SETUP," and replace it as soon as possible.
Off	The server is off-powered.	Power on the server.
	POST is in progress.	Wait for a while. The STATUS LED turns green when POST is completed.
	A CPU error occurred.	Cycle power to the server. If POST displays an error message, take a note on the message and contact your service representative.
	A CPU thermal error was detected.	
	A watchdog timer has timed out.	
	An uncorrectable memory error was detected.	
	A PCI system error occurred.	
	A PCI parity error occurred.	
	A PCI bus error occurred.	
Memory dumping is requested.	Wait until memory dumping completes.	
On (amber)	A thermal error was detected.	Check internal fans for dust or debris. Also make sure that the fans are firmly connected. If this error indication persists, contact your service representative.
	A voltage error was detected.	Contact your service representative.
Blinking (amber)	A fan alarm was detected.	Make sure that the fan units are firmly connected. If this error indication persists, contact your service representative.
	A thermal warning was detected.	Check internal fans for dust or debris. Also make sure that the fan units are firmly connected. If this error indication persists, contact your service representative.
	A voltage warning was detected	Contact your service representative.
	An error was detected on either of the hard disk drives.	Replace the hard disk drive.

DISK ACCESS LED

The DISK ACCESS LED on the front panel goes on while the internal hard disk drive or optical disk drive is accessed.

UID LED (Unit Identification)

Pressing the UID switch turns the UID LED located on the front and rear of the server on and off. Pressing the UID switch again turns off the UID LED. The UID LED blinks upon reception of command from software. If more than one server is installed in a single rack, the LED identifies the server you are going to maintain. Especially, this LED helps you identify the target server when working from the rear of the rack.

LINK/ACT LED

The LINK/ACT LED indicates the state of each factory-installed network port. If the power is supplied to the server and the hub and they are correctly connected with each other, the LED is lit green (LINK state). If information is transmitted through a network port, the LED blinks green (ACT state).

If the LED is not lit in the LINK state, check the network cable and the cable connection. If the LED is not lit still after the checking, the network (LAN) controller may be defected. Contact your service representative.

NOTE: LINK LED of LAN ports (connected with LAN cable)

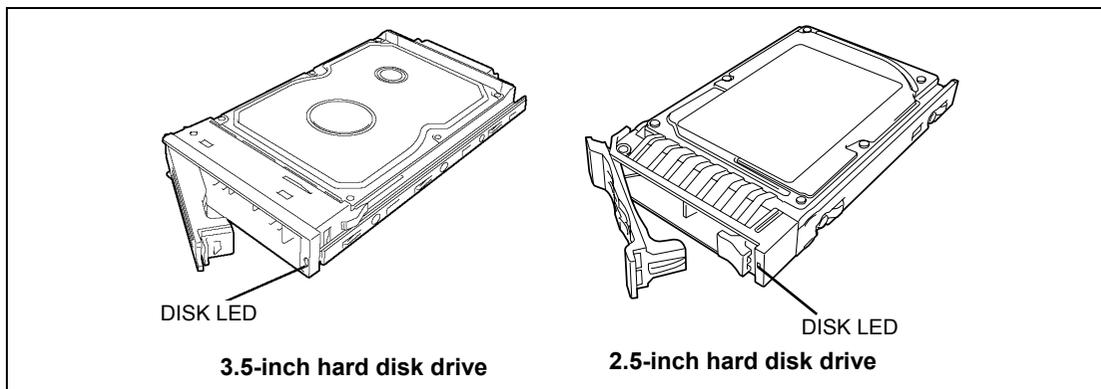
If WOL is disabled, the LINK LED goes off by the power-saving feature when the OS is shutdown. If WOL is enabled, the LINK LED goes on in the state of DC OFF.

SPEED LED

The SPEED LED on the rear panel indicates whether each of the factory-installed network ports is operated through the 1000BASE-T, 100BASE-TX or 10BASE-T network interface. If the LED is lit amber, the network port is operated through 1000BASE-T. If the LED is lit green, the network port is operated through 100BASE-TX. If the LED is off, the network port is operated through 10BASE-T.

Hard Disk Drive LED

The hard disk drive bay can contain three hard disk drives. Each hot-plug hard disk drive has a DISK LED on its front panel.



The DISK LED indicates the drive status as follows.

- **Blinking green**
Indicates that the hard disk drive is accessed.
- **Lighting amber**
Indicates that the installed hard disk drive is defected.

NOTE: While hard disk drives are in the RAID configuration (RAID1, 5, or 6), a single failed hard disk drive does not affect the operation of the server. However, it is recommended to replace the failed hard disk drive and auto-rebuild (reconfigure) the hard disk drives as soon as possible. (You can hot-swap such a failed hard disk drive.)

- **Alternate blinking amber or green**
Indicates that the hard disk drive is being rebuilt (this status is not a failure). If the defected hard disk drive is replaced with a new one in the RAID configuration, the data is automatically rebuilt (auto rebuild function).
The LED goes off when the rebuild is terminated normally. The LED goes on amber if the rebuild fails.

IMPORTANT: Powering off the server aborts rebuilding. In such a case, restart the server, hot-swap the failed hard disk drive, and restart rebuilding. Observe the following notes to use the auto-rebuild feature.

- Do not power off the server. (If the server is powered off before rebuilding hard disk drives, the auto-rebuild feature will not start.)
 - When you removed a hard disk drive, wait at least 90 seconds before installing the hard disk drive back again.
 - Do not replace another hard disk drive while rebuilding is in progress.
-

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 SCSI Configuration Utility appears on the screen following the server reboot.

IMPORTANT: Take a note on the on-screen message before contacting your service representative. 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 service representative. Alarm messages are useful information for maintenance.

Error code	Error message	Recommended Action
0200	Failure Fixed Disk.	Contact your service representative.
0210	Stuck Key.	Disconnect the keyboard and connect it again.
0211	Keyboard error	Disconnect the keyboard, connect it again, then restart the system. If the error cannot be corrected, contact your service representative.
0213	Keyboard locked - Unlock key switch.	Release the lock of the key switch. If the error cannot be corrected in spite of the release of the lock, contact your service representative.
0220	Monitor type does not match CMOS - Run SETUP.	Start the SETUP. If the error cannot be corrected in spite of the start of SETUP, contact your service representative.
0230	System RAM Failed at offset.	Contact your service representative.
0231	Shadow Ram Failed at offset.	
0232	Extended RAM Failed at address line.	
0250	System battery is dead - Replace and run SETUP.	Contact your service representative to replace the battery. (After restarting the computer, start the SETUP to provide the setting again.)
0251	System CMOS checksum bad - Default configuration used.	The default values have just been set. Start the SETUP to provide the setting again. If the error cannot be corrected, contact your service representative.
0252	Password checksum bad - Passwords cleared.	The password has just been cleared. Start the SETUP to provide the setting again.
0260	System timer error.	Start the SETUP to set the date and time again. If the same error occurs successively in spite of the resetting, contact your service representative.
0270	Real time clock error.	
0271	Check date and time setting.	
0280	Previous boot incomplete - Default configuration used.	Start the SETUP to provide the setting again.
0281	Memory size found by POST differed from EISA CMOS.	Initialize EISA CMOS.
02D0	System cache error - Cache disabled.	The cache cannot be used. Contact your service representative.

Error code	Error message	Recommended Action
02D1	System Memory exceeds the CPU's caching limit.	Contact your service representative.
02F4	EISA CMOS not writeable.	
02F5	DMA Test Failed.	
02F6	Software NMI Failed.	
02F7	Fail-safe Timer NMI Failed.	
0611	IDE configuration changed	Check IDE configuration.
0612	IDE configuration error - device disabled	Check COM A configuration.
0613	Com A configuration changed	
0614	Com A config. error - device disabled	
0615	Com B configuration changed	Check COM B configuration.
0616	Com B config. error - device disabled	Remove the USB device. If the error cannot be corrected, contact your service representative.
0700	USB Over Current on HC-	
0701	USB Over Current on HC/Port	
0B22	Processors are installed out of order.	Contact your service representative to replace the CPU.
0B28	Unsupported CPU detect on CPU socket 1.	Make sure that the server supports the CPU. If you are not sure, contact your service representative to request the maintenance.
0B29	Unsupported CPU detect on CPU socket 2.	
0B42	Resource Conflict	Contact your service representative.
0B43	Warning: IRQ not configured	
0B45	System configuration Data Write Error	
0B60	CPU1_DIMM1 has been disabled	
0B61	CPU1_DIMM2 has been disabled	
0B62	CPU1_DIMM3 has been disabled	
0B63	CPU1_DIMM4 has been disabled	
0B66	CPU2_DIMM1 has been disabled	
0B67	CPU2_DIMM2 has been disabled	
0B68	CPU2_DIMM3 has been disabled	
0B69	CPU2_DIMM4 has been disabled	
0B6F	DIMM with error is enabled.	
0B70	The error occurred during temperature sensor reading.	
0B71	System Temperature out of the range.	
0B74	The error occurred during voltage sensor reading.	Contact your service representative.
0B75	System voltage out of the range.	
0B80	BMC Memory Test Failed.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B81	BMC Firmware Code Area CRC check failed.	
0B82	BMC Core Hardware failure.	
0B83	BMC IBF or OBF check failed.	
0B8A	BMC SEL area full.	Start the SETUP and select [Server] - [Event Log configuration] - [Clear All Error Logs] and press Enter to clear event logs.

Error code	Error message	Recommended Action
0B8B	BMC progress check timeout.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B8C	BMC command access failed.	
0B8D	Could not redirect the console - BMC Busy -	
0B8E	Could not redirect the console - BMC Error -	
0B8F	Could not redirect the console - BMC Parameter Error -	
0B90	BMC Platform Information Area corrupted.	
0B91	BMC update firmware corrupted.	This is not a fatal error. Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B92	Internal Use Area of BMC FRU corrupted.	
0B93	BMC SDR Repository empty.	Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B94	IPMB signal lines do not respond.	This is not a fatal error. Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B95	BMC FRU device failure.	This is not a fatal error. Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B96	BMC SDR Repository failure.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B97	BMC SEL device failure.	
0B98	BMC RAM test error.	
0B99	BMC Fatal hardware error.	
0B9A	BMC not responding.	Update the RMC firmware. If the error cannot be corrected, contact your service representative.
0B9B	Private I2C bus not responding.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B9C	BMC internal exception.	
0B9D	BMC A/D timeout error.	
0B9E	SDR repository corrupt.	
0B9F	SEL corrupt.	
0BB0	SMBIOS – SROM data read error.	
0BB1	SMBIOS – SROM data checksum bad.	Contact your service representative.
0BD1	1st SMBus device Error detected.	
0BD4	2nd SMBus device Error detected.	
0BD7	3rd SMBus device Error detected.	
0BDA	4th SMBus device Error detected.	
0BDD	5th SMBus device Error detected.	
0BE0	6th SMBus device Error detected.	

Error code	Error message	Recommended Action
8068	Unsupported Processor Speed detected on CPU Slot 1.	Contact your service representative.
8069	Unsupported Processor Speed detected on CPU Slot 2.	
8150	NVRAM Cleared by Jumper	Start SETUP and provide setting again.
8151	Password Cleared by Jumper	Start SETUP and set password again.
8160	Mismatch Processor Type/Speed detected on Processor 1.	Contact your service representative.
8161	Mismatch Processor Type/Speed detected on Processor 2.	
None	Expansion ROM not initialized – PCI Mass Storage Controller in slot xx	Disable initialization of the optional device expansion ROM by using the BIOS SETUP utility (see Chapter 4).
	H/W Configuration of BMC is corrupted. !! Update BMC F/W Configuration by configuration tool !! !! Refer to BMC configuration manual !!	Use the NEC EXPRESSBUILDER to configure the remote management card (see Chapter 6).
	Memory Scramble mode disabled	Contact your service representative.

Messages displayed by RAID Controller during POST

On-screen message	Action
<p>Memory/battery problems were detected. The adapter has recovered, but cached data was lost. Press any key to continue, or 'C' to load the configuration utility.</p>	<p>Contact your service representative.</p>
<p>Firmware version inconsistency was detected. The adapter has recovered, but cached data was lost. Press any key to continue, or 'C' to load the configuration utility.</p>	<p>Contact your service representative.</p>
<p>Foreign configuration(s) found on adapter Press any key to continue, or 'C' to load the configuration utility.</p>	<p>Press C to run the utility to import or clear configuration.</p>
<p>Previous configuration cleared or missing Importing configuration created on MM/DD hh:mm Press any key to continue, or 'C' to load the configuration utility.</p>	<p>Contact your service representative.</p>
<p>An enclosure was found that contains both SAS and SATA drives, but this controller does not allow mixed drive types in a single enclosure. Please correct the problem then restart your system. Press any key to continue, or 'C' to load the configuration utility.</p>	<p>RAID Controller may be faulty. Contact your service representative to replace the RAID controller.</p>
<p>SAS drives were detected, but this controller does not support SAS drives. Please remove the SAS drives then restart your system. Press any key to continue, or 'C' to load the configuration utility.</p>	<p>RAID Controller may be faulty. Contact your service representative to replace the RAID controller.</p>
<p>SATA drives were detected, but this controller does not support SATA drives. Please remove the SATA drives then restart your system. Press any key to continue, or 'C' to load the configuration utility.</p>	<p>RAID Controller may be faulty. Contact your service representative to replace the RAID controller.</p>
<p>Invalid SAS topology detected. Please check your cable configurations, repair the problem, and restart your system.</p>	<p>Check if cable is connected properly. If the same error persists, contact your service representative.</p>
<p>The battery hardware is missing or malfunctioning, or the battery is unplugged. If you continue to boot the system, the battery-backed cache will not function. Please contact technical support for assistance. Press 'D' to disable this warning (if your controller does not have a battery).</p>	<p><When battery is not used> Press D to hide this message.</p> <p><When battery is used> Check if battery is connected properly. If the same error persists, contact your service representative.</p>

On-screen message	Action
<p>Your VD's that are configured for write-back are temporarily running in write-through mode.</p> <p>This is caused by the battery being charged, missing, or bad.</p> <p>Please allow battery to charge for 24 hours before evaluating battery for replacement.</p> <p>The following VD's are affected :AFX</p> <p>Press any key to continue.</p>	<p><When battery is not used> Ignore this message.</p> <p><When battery is used> Run WebBIOS or Universal RAID Utility to check if battery is detected.</p> <ul style="list-style-type: none"> • Battery is not detected: <ul style="list-style-type: none"> – Check if battery is connected properly. – Battery may be insufficiently charged. Halt the system for 24 hours or longer and charge battery. • Battery is detected: <ul style="list-style-type: none"> – Halt the system for 9 hours or longer and charge battery. <p>If the same error persists, contact your service representative.</p>
<p>Invalid SAS Address present in MFC data. Please program valid SAS Address, and restart your system.</p>	<p>Contact your service representative.</p>
<p>Some configured disks have been removed from your system, or are no longer accessible. Please check your cables and also ensure all disks are present.</p> <p>Press any key to continue, or 'C' to load the configuration utility.</p>	<p>Check if cable and hard disk drives are connected properly. If the same error persists, contact your service representative.</p>
<p>The following VD's have missing disks: xx</p> <p>If you proceed (or load the configuration utility), these VD's will be marked OFFLINE and will be inaccessible.</p> <p>Please check your cables and ensure all disks are present.</p> <p>Press any key to continue, or 'C' to load the configuration utility.</p>	
<p>The following VD's are missing: xx</p> <p>If you proceed (or load the configuration utility), these VD's will be removed from your configuration. If you wish to use them at a later time, they will have to be imported. If you believe these VD's should be present, please power off your system and check your cables to ensure all disks are present.</p> <p>Press any key to continue, or 'C' to load the configuration utility.</p>	
<p>All of the disks from your previous configuration are gone. If this is an unexpected message, then please power off your system and check your cables to ensure all disks are present.</p> <p>Press any key to continue, or 'C' to load the configuration utility.</p>	

On-screen message	Action
<p>The cache contains dirty data, but some VD's are missing or will go offline, so the cached data can not be written to disk. If this is an unexpected error, then please power off your system and check your cables to ensure all disks are present. If you continue, the data in cache will be permanently discarded.</p> <p>Press 'X' to acknowledge and permanently destroy the cached data.</p>	<p>Check if cable, hard disk drives, and upgrade kit are connected properly. If the same error persists, contact your service representative.</p> <p>NOTE: If you press X, the data in cache memory will be lost.</p>
<p>Invalid memory configuration detected. Please contact your system support. System has halted.</p>	<p>Contact your service representative to replace the RAID controller.</p>
<p>RAID Adapter FW Failed Validation!!! Adapter needs to be reflashed. Press any key to continue.</p>	<p>Contact your service representative to replace the RAID controller.</p>
<p>Cache data was lost due to an unexpected power-off or reboot during a write operation, but the adapter has recovered. This could be due to memory problems, bad battery, or you may not have a battery installed.</p> <p>Press any key to continue or 'C' to load the configuration utility.</p>	<p><When battery is not used> Run WebBIOS or Universal RAID Utility to check the setting for cache mode. If forced write-back is specified, change it to constant write back or write through mode.</p> <p><When battery is used> Check if battery is connected properly.</p> <p>If the same error persists, contact your service representative to replace the RAID controller and battery.</p>
<p>Entering the configuration utility in this state will result in drive configuration changes. Press 'Y' to continue loading the configuration utility or please power off your system and check your cables to ensure all disks are present and reboot.</p>	<p>Contact your service representative to replace the RAID controller.</p>
<p>Multibit ECC errors were detected on the controller. DIMM on the controller needs replacement. If you continue, data corruption can occur. Press 'X' to continue or else power off the system and replace the DIMM module and reboot. If you have replaced the DIMM please press 'X' to continue.</p>	<p>Contact your service representative to replace the RAID controller.</p>
<p>Multiple Single-bit ECC errors were detected during the previous boot of the controller. DIMM on the controller needs replacement. If you continue, data corruption can occur. Press 'X' to continue or else power off the system and replace the DIMM module and reboot. If you have replaced the DIMM please press 'X' to continue.</p>	<p>Contact your service representative to replace the RAID controller.</p>

On-screen message	Action
<p>Single-bit overflow ECC errors were detected during the previous boot of the controller. DIMM on the controller needs replacement.</p> <p>If you continue, data corruption can occur. Press 'X' to continue or else power off the system and replace the DIMM module and reboot. If you have replaced the DIMM please press 'X' to continue.</p>	<p>Contact your service representative to replace the RAID controller.</p>

Beep Codes

If an error occurs during the POST, the server beeps, indicating the type of error.

Each number indicates the number of short beeps, and a hyphen indicates a pause. For example, the beep interval 1-3-1-1 indicates 1 beep, pause, 3 beeps, pause, 1 beep, pause, and 1 beep notifying that the DRAM refresh test error occurred.

Beep code	Description	Recommended action
3-3 (repetitive)	ROM checksum error	Contact your service representative to replace the mother board.
1-2-2-3		
1-3-1-1	DRAM refresh test error	Check if the DIMMs are properly connected. If the error persists, contact your service representative to replace DIMM or mother board.
1-3-1-3	Keyboard controller error	Disconnect the keyboard and connect it again. If the error persists, contact your service representative to replace the mother board.
1-3-3-1	Capacity check error There might be no memory installed or an unsupported CPU might have been installed.	Check if the DIMMs are properly connected. If the error persists, contact your service representative to replace the DIMM, CPU, or mother board.
1-3-4-1	DRAM address error	
1-3-4-3	DRAM test Low Byte error	
1-4-1-1	DRAM test High Byte error	
1-5-1-1	CPU startup error	Contact your service representative to replace the mother board.
1-5-2-1	No CPU installed	Contact your service representative to replace the CPU or mother board.
2-1-2-3	BIOS ROM copyright test error	Contact your service representative to replace the mother board.
2-2-3-1	Unexpected interrupt test error	
1-2	Option ROM initialization error	Check if BIOS SETUP is correctly configured. If an expansion of Option ROM for additionally installed PCI board is not displayed, check if the PCI board is properly installed. If the error persists, contact your service representative to replace the mother board or PCI board.

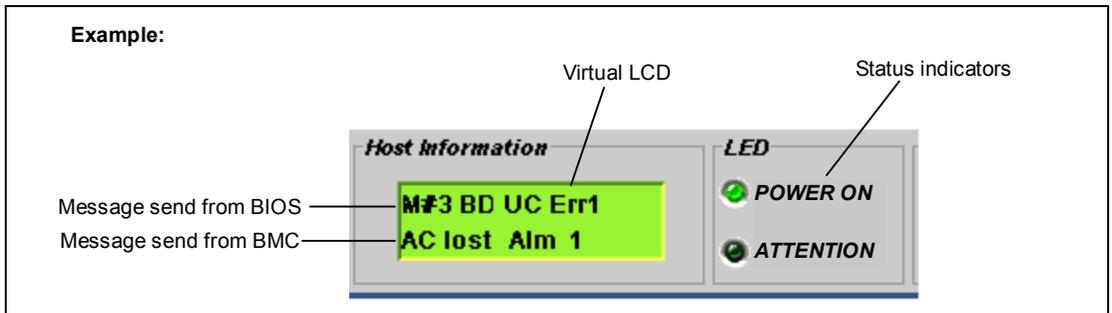
NOTE: Beep code 1-5-4-2 informs you that AC power supply is interrupted due to power failure or momentary voltage drop and the system is restarted. This is not an error.

Error Messages on Virtual LCD

NEC EXPRESSSCOPE Engine 2 (Remote Management Controller) on your server board allows you to monitor the server status on the WEB browser-based screen of the client PC via network.

The virtual LCD (16 digits x 2 lines) in the "Host Information" area displays the POST codes and status message.

When POST detects an error, the POST error code is displayed on the virtual LCD upon completion of POST. See the table for POST error codes for details.



Messages displayed on upper line (BIOS message)

On-screen message	Description	Action
XX BIOS Rev XXXX	POST in progress. XX: POST code, YYYY: BIOS version	Wait until POST completes.
Prepare To Boot	POST completes normally.	
Mem Reconfigured	POST completes with memory degraded.	Contact your service representative.
Mem Err Disable	A correctable memory error frequently occurred.	
CPU Reconfigured	POST completes with processor degraded.	
Memory C-Err XX	A correctable error frequently occurs in DIMM #XX.	
Memory U-Err XX	An uncorrectable error has occurred in DIMM #XX.	
PCI Bus SERR XX	A SERR has occurred in the PCI bus XX.	
PCI Bus PERR XX	A PERR has occurred in the PCI bus XX.	
Chipset Err XXXX	A chipset error occurred.	

Messages displayed on lower line (BMC message)

On-screen message	Description	Action
Proc VccpAlm XX	Voltage alarm occurred XX=09: high voltage (fatal) XX=07: high voltage (warning) XX=02: low voltage (warning) XX=00: low voltage (fatal)	Contact your service representative.
BB +1.2v Alm XX		
BB +1.5v Alm XX		
BB +1.8v Alm XX		
BB +3.3v Alm XX		
BB +3.3vs Alm XX		
BB +5.0v Alm XX		
BB +5vs Alm XX		
BB +12v Alm XX		
VBAT Alm XX		
BB Temp2 Alm XX	Mother board thermal error occurred. XX=09: high voltage (fatal) XX=07: high voltage (warning) XX=02: low voltage (warning) XX=00: low voltage (fatal)	Fan may be faulty or clogged with dust. Contact your service representative.
Proc Temp Alm XX		
Proc Therm % XX	Processor thermal error occurred. XX=09: high voltage (fatal) XX=07: high voltage (warning) XX=02: low voltage (warning) XX=00: low voltage (fatal)	
DUMP Request !	Dump switch is pressed.	Wait for completion of memory dump collection.
OS shutdown Alm	OS stop error occurred.	Take note of on-screen message, wait for completion of memory dump collection, then contact your service representative.
Power On Cnt Alm	Power supply failure occurred.	Contact your service representative.
Proc Missing	Processor is not found.	
Proc T-Trip	Thermal Trip occurred on processor. The system is forcibly turned off.	
Processor IERR	IERR occurred on processor.	
SMI timeout	SMI timeout occurred.	
WDT timeout	Watchdog timer timeout error occurred.	
SF X Alarm	A fan alarm occurred. X: 3 to 12	
HDD Fault	A hard disk drive error occurred.	<ol style="list-style-type: none"> 1. Check if the hard disk drives are properly installed. 2. Replace the failed hard disk drive and perform rebuilding. 3. If the same error occurs, contact your service representative.

SOLVING PROBLEMS

When the server fails to operate as expected, see the following to find out your problem and follow the instruction given before asking for repair.

If the server still fails to operate successfully after solving your problem, take a note on the on-screen message and contact your service representative.

Problems with the Server

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. When using the DC power model, check that the EcoPowerGateway power supply connected to the server 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] - [AC-LINK]>
- ❑ Did you press the POWER switch?
 - Press the POWER switch on the front of the server to turn on the power (the POWER LED lights). When using the DC power model, turn on the DC switch on the rear of the server.

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] - [Enabled]>

POST fails to complete:

- ❑ Is the DIMM board installed?
 - Check if DIMMs are properly installed.
- ❑ 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 again. Do not perform any keyboard or mouse operation until the BIOS start-up message appears when you restart the server.
- ❑ Does the server have contains appropriate memory boards or PCI devices?
 - Operation of the server with unauthorized devices is not guaranteed.

Fail to access to internal or external devices (or such devices fail to operate):

- ❑ Are cables properly connected?
 - Make sure that the interface cables and power cord are properly connected. Also make sure that the cables are connected in the correct order.
- ❑ Is the power-on order correct?
 - When the server has any external devices connected, power on the external devices first, then the server.
- ❑ Did you install drivers for connected optional devices?
 - Some optional devices require specific device drivers. Refer to the manual that comes with the device to install its driver.
- ❑ Is BIOS configuration correct?
 - When the server has PCI devices connected, make sure to set the PCI device interrupt and others with the BIOS SETUP utility of the server. (Most PCI devices generally do not require any change to the configuration, but some boards do require specific settings. Refer to the manual that comes with the board for details to make correct settings.

<Menus to check: [Advanced] - [PCI Configuration] - [PCI Slot xx ROM]
x: PCI slot number>
 - Some devices connected to the serial, parallel, or USB port may require I/O port address or operation mode settings. Refer to the manual that comes with the board for details to make correct settings.

<Menu to check: [Advanced] - [Peripheral Configuration]>

The keyboard or mouse fails to operate:

- ❑ Is the cable properly connected?
 - You must use the provided keyboard/mouse branch cable (Y cable) for this server. Make sure that the provided 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.
- ❑ Is BIOS configuration correct?
 - The keyboard and mouse may be disabled with the BIOS SETUP utility of the server. Check the settings with the BIOS SETUP utility.
<Menus to check: [Advanced] - [Numlock]>
- ❑ Are the server drivers installed?
 - Refer to the manual that comes with your OS to check that the keyboard and mouse drivers are installed. (These drivers are installed along with the OS.) Some OS's allow you to change the keyboard and mouse settings. Refer to manual that comes with your OS to check that the keyboard and mouse settings are correct.

Fail to access to the disc:

- ❑ Is the disc properly set in the optical disk drive tray?
 - The tray is provided with a holder to secure the disc. Make sure that the disc is placed properly in the holder.
- ❑ Is the disc applicable to the server?
 - For the disc which does not conform to the DVD/CD standard, the playback of such a disc with the optical disk drive is not guaranteed.
 - The disc for Macintosh is not available for use.

Inserted the correct disc 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 disc dirty or injured?
 - Take the disc out of the optical disk drive, confirm that it is not dirty or injured, reset and click [OK].

Fail to access the hard disk drive:

(Refer to the documentation supplied with the RAID Controller.)

- ❑ Is the hard disk drive applicable to the server?
 - Operation of any device that is not authorized by NEC is not guaranteed.
- ❑ Is the hard disk drive properly installed?
 - Make sure to lock the hard disk drive with the lever on its handle. The hard disk drive is not connected to the internal connector when it is not completely installed (see Chapter 9).

DISK ACCESS LED lights green:

- ❑ Is the RAID controller installed?
 - Patrol Read is running. If N8103-129/130/134/135 is installed, Patrol Read runs regularly.
During Patrol Read, the Access LED on hard disk drive lights as follows.
 - Blinks green if SAS hard disk drives are installed.
 - Lights green if SATA hard disk drives are installed.
- ❑ Other than above:
 - The LED lights green while accessing the hard disk drive. Lighting orange of this LED does not mean hard disk drive failure.

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.
- ❑ Are SCSI devices properly configured?
 - When the server has external SCSI devices connected, hard disk drive settings, including SCSI ID and terminator, are required. Refer to the manual that comes with the SCSI device for details.
- ❑ Are the SCSI controllers (including optional controllers) properly configured?
 - Use the SCSI BIOS setup utility for proper configuration of SCSI devices connected to the SCSI connector on the mother board. When the server has an optional SCSI controller installed and SCSI devices connected to it, use the SCSI BIOS setup utility that comes with the optional SCSI controller for proper configuration. See the manual that comes with the optional SCSI controller for details.

Fail to start the OS:

- ❑ Is the NEC EXPRESSBUILDER DVD in the optical disk drive?
 - Take out the NEC EXPRESSBUILDER DVD and restart the server.
- ❑ Is the OS broken?
 - Use recovery process to recover the system.

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 with 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 LAN] - [LAN Controller]>
- ❑ 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.

The POWER LED goes on when the power cord is connected:

- When the server receives an AC power after the power cord is connected, the POWER LED goes on. This is a normal operation of the server, not a fault. The LED will go off when DC power is turned on, and then off.

In case using Intel Network adapter teaming:

Event Type: Warning
Event Source: iANSMiniport
Event Category: None
Event ID: 11
Description: Adapter link down: Intel ----

Event Type: Warning
Event Source: iANSMiniport
Event Category: None
Event ID: 13
Description: Intel ---- has been deactivated from the team.

Event Type: Warning
Event Source: iANSMiniport
Event Category: None
Event ID: 16
Description: [Team Name]: The last adapter has lost link.
Team network connection has been lost.

Event Type: Warning
Event Source: iANSMiniport
Event Category: None
Event ID: 22
Description: Primary Adapter does not sense any Probes:
Intel ---- Possible reason: partitioned Team.

→ Above mentioned event log will appear when the system starts.
There is no problem in LAN driver operation.

LAN driver is installed:

Event Type: Warning
Event Source: e1qexpress
Event Category: None
Event ID: 27
Description: Intel(R) 82574L Gigabit Network Connection.
Network link has been disconnected.

→ Even if LAN cable is connected, above mentioned event log will appear when the system starts.
There is no problem in LAN driver operation.

Problems with Windows

The following warnings are logged when you start Windows Server 2008 R2 or Windows Server 2008:

Event ID: 27
 Source: e1qexpress
 Level: Warning
 Description: Intel(R) 82574L Gigabit Network Connection.
 Network link has been disconnected.

→ If the above event is logged when you start the system, this event does not affect system operation. Ignore this message.

Event ID: 63
 Source: Microsoft-Windows-WMI
 Level: Warning
 Description: A provider, Ncs2, has been registered in the Windows Management Instrumentation namespace Root\IntelNCS2 to use the LocalSystem account.
 This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.

→ This event does not affect system operation. Ignore this message.

The following system event is logged when Windows Server 2008 R2 is installed:

Event ID: 134
 Source: Microsoft-Windows-Time-Service
 Level: Warning
 Description: NtpClient was unable to set a manual peer to use as a time source because of DNS resolution error on ".
 NtpClient will try again in 3473457 minutes and double the reattempt interval thereafter.
 The error was: No such host is known. (0x80072AF9)

→ This event does not affect system operation. Ignore this message.

The following application event is logged when Windows Server 2008 R2 is installed:

Event ID: 1534
Source: Microsoft-Windows-User Profiles Service
Level: Warning
Description: Profile notification of event Create for component {56EA1054-1959-467f-BE3B-A2A787C4B6EA} failed, error code is The revision level is unknown.

→ This event does not affect system operation. Ignore this message.

The following system events are logged when I use the system:

Event ID: 1
Source: iScsiPrt
Level: Error
Description: Initiator failed to connect to the target. Target IP address and TCP Port number are given in dump data.

→ Go to the Microsoft website:
<http://support.microsoft.com/default.aspx/kb/976072/en-us>

The following warnings are logged to application event log when you import a transportable shadow-copy to another server that has a read-only volume while operating Windows Server 2008 R2:

Event ID: 8193
Source: VSS
Level: Error
Description: Volume Shadow Copy Service error: Unexpected error calling routine IOCTL_DISK_GET_DRIVE_LAYOUT_EX(\\?\mpio#disk&ven_nec&prod_istorage_2000&rev_2800#1&7f6ac24&0&303030303030303933313030303735373030323934#{ GUID }) - BuildLunInfoForDrive. hr = 0x80070013, This media is write-protected.

Event ID: 12289
Source: VSS
Level: Error
Description: Volume Shadow Copy Service error: Unexpected error DeviceIoControl(\\?\storage#volume#{ GUID }#000000000010000#{ GUID } -0000000000002B8,0x00560000,0000000000000000,0,00000000002BE0C0,4096,[0]). hr = 0x80070013, This media is write-protected.

→ Go to the Microsoft website:
<http://support.microsoft.com/kb/2003016/en-us>

The following warnings are logged to application event log when I import a transportable shadow-copy to another server that has a floppy disk drive while operating Windows Server 2008 R2:

Event ID: 12289
 Source: VSS
 Level: Error
 Description: Volume shadow copy service error: unexpected error
 DeviceIoControl (\? # 6 \usbstor#sfloppy &ven_tec&prod_fd-05pub
 &rev_3000 & 158e20d0 & 0 # { GUID }-00000000000002B8,
 0x00560000, 0000000000000000, 0,000000000327C70,4096, [0]).
 HR = 0x80070032, this request is not supported.

→ Go to the Microsoft website:
<http://support.microsoft.com/kb/2003968/en-us>

The following system events are logged when Windows Server 2008 is installed:

Event ID: 5
 Source: storflt
 Level: Warning
 Description: the Virtual Storage Filter Driver is disabled through the registry.
 It is inactive for all disk drivers.

Event ID: 134
 Source: Microsoft-Windows-Time-Service
 Level: Warning
 Description: NtpClient was unable to set a manual peer to use as a time source because
 of DNS resolution error on 'time.windows.com,0x9'. NtpClient will try
 again in 15 minutes and double the reattempt interval thereafter.
 The error was: No such host is known. (0x80072AF9)

Event ID: 263
 Source: PlugPlayManager
 Level: Warning
 Description: The service 'ShellHWDetection' may not have unregistered for device
 event notifications before it was stopped.

Event ID: 7000
 Source: Service Control Manager
 Level: Error
 Description: The Parallel port driver service failed to start due to the following error:
 The service cannot be started, either because it is disabled or because it has
 no enabled devices associated with it.

Event ID: 15016
 Source: Microsoft-Windows-Http

Level: Error
Description: Unable to initialize the security package Kerberos for server side authentication. The data field contains the error number.

→ These events do not affect system operation. Ignore these messages.

The following application events are logged when Windows Server 2008 is installed:

Event ID: 63
Source: Microsoft-Windows-WMI
Level: Warning
Description: A provider, Ncs2, has been registered in the Windows Management Instrumentation namespace Root\cimv2 to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.

A provider, IntelEthernetDiag, has been registered in the Windows Management Instrumentation namespace Root\CIMv2 to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.

A provider, WmiPerfClass, has been registered in the Windows Management Instrumentation namespace root\cimv2 to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.

Event ID: 6000
Source: Microsoft-Windows-Winlogon
Level: Warning
Description: The winlogon notification subscriber <GPClient> was unavailable to handle a notification event.

Event ID: 6001
Source: Microsoft-Windows-Winlogon
Level: Warning
Description: The winlogon notification subscriber <GPClient> failed a notification event.

→ These events do not affect system operation. Ignore these messages.

The following system event is logged when Windows Server 2008 is installed:

Event ID: 10
Source: VDS Dynamic Provider
Description: The provider failed while storing notifications from the driver. The Virtual Disk Service should be restarted. hr=80042505

→ Go to the Microsoft website:
<http://support.microsoft.com/kb/948275/en-us/>

The following application events are logged when Windows Server 2008 is installed:

Event ID: 1021
 Source: Microsoft-Windows-Security-Licensing-SLC
 Level: Warning
 Description: SLUINotify service has failed to start. hr=0x80070424

Event ID: 1534
 Source: Microsoft-Windows-User Profiles Service
 Level: Warning
 Description: Profile notification of event Create for component {56EA1054-1959-467f-BE3B-A2A787C4B6EA} failed, error code is -2147023591.

→ These events do not affect system operation. Ignore these messages.

In the case of Windows Server 2008, LAN driver is installed:

Event Type: Warning
 Event Source: elqexpress
 Event Category: None
 Event ID: 27
 Description: Intel(R) 82574L Gigabit Network Connection.
 Network link has been disconnected.

→ Above mentioned event log will appear when the system starts.
 There is no problem in LAN driver operation.

There are some cases that an event log is registered as follows when you install Windows Server 2003 x64 Editions:

Source: DCOM
 Category: Error
 Event ID: 10016
 Description: The application-specific permission settings do not grant Local Activation permission for the COM server application with CLSID {555F3418-D99E-4E51-800A-6E89CFD8B1D7} to the user {NT AUTHORITY\LOCAL SERVICE} SID {S-1-5-19}. This security permission can be modified using the component Services administrative tool.

→ It is not a problem in operating the system.

There are some cases that an event log is registered as follows when you install Windows Server 2003 x64 Editions:

Event Source: Service Control Manager
Event Type: Error
Event ID: 7011
Description: Timeout (30000 milliseconds) waiting for a transaction response from the IMAP4Svc service.

→ When this event is not registered by rebooting the system, it is not a problem in operating the system.

Installed Service Pack before application of Windows Server 2003 R2 DISC 2 during Windows Server 2003 R2 installation:

→ Apply Windows Server 2003 R2 DISC 2, and then install Service Pack again by "Updating the System".

Fail to access to USB devices on Windows Server 2003 x64 Edition or Windows Server 2003:

- ❑ Did you apply [Hotfix for Windows x64 "KB921411"] or [Hotfix for Windows Server 2003 (KB921411)] prior to the "Updating the System" process?

Specify whether "!" is displayed or not on the USB root hub.

<verification process>

Click Start menu, right-click [My Computer], and click [Manage] to start Device Manager.

And then, select [Device Manager] from the left side window.

→ If "!" is displayed on the USB root hub, apply the Hotfix according to the "Recovery process".

For "Recovery process", see Chapter F or Chapter G for details.

Fail to restart the system with the message means "pci.sys missing or corrupt" after you executed "Updating the System" process to Windows Server 2003 x64 Edition or Windows Server 2003:

- ❑ During the application of the ChipSet driver by "Updating the System" process, the driver for the USB device may be deleted.

Follow the process detailed below.

- (1) Start the Recovery console.
- (2) Copy "<Systemdrive>\system32\dllcache\pci.sys" to under "<Systemdrive>\system32\drivers".
- (3) Exit the Recovery console, and restart the system.
- (4) Refer to "Recovery process" and follow to the process detailed to apply [Hotfix for Windows x64 "KB921411"] or [Hotfix for Windows Server 2003 (KB921411)] and "Updating the System".

For "Recovery process", see Chapter F or Chapter G for details.

There are some cases that an event log is registered as follows when you operate Windows Server 2003 R2:

Source: IPMIDRV

Type: Error

Event ID: 1001

Description: The IPMI device driver attempted to determine if the system supported an IPMI BMC device. The driver attempted to detect the presence of the IPMI BMC by searching the SMBIOS for Type 38 record. But either no record was found or the record was not compatible with the version of the device driver.

If a SMBIOS Type 38 record was detected, the Dump Data field of the event contains a binary representation of the record.

→ If you use "Hardware Management" which is provided by Windows Server 2003 R2, above-shown event log will be registered.

For more details, refer to "Enabling Microsoft Windows Server 2003 R2 Hardware Management" on the following site.

[NEC Express5800 Web Site]

http://www.nec.co.jp/express/download/W2K3_R2

In the case of Windows Server 2003, LAN driver is installed:

Event Type: Information

Event Source: e1qexpress

Event Category: None

Event ID: 32

Description: Intel(R) 82574L Gigabit Network Connection.
Network link has been established at 1Gbps full duplex.

Event Type: Warning

Event Source: e1qexpress

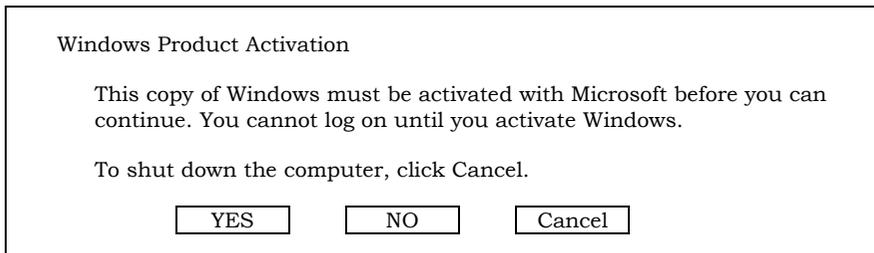
Event Category: None

Event ID: 27

Description: Intel(R) 82574L Gigabit Network Connection.
Network link has been disconnected.

→ Above mentioned event log will appear when the system starts.
There is no problem in LAN driver operation.

The system displays the message below and fails to log on:



→ In Windows Server 2003, the above message will be displayed if you use the operating system without executing the license authentication. Select "Yes", and execute the procedure for license authentication.

Cannot install the operating system correctly:

- Did you confirm the notes on installing the operating system?

→ See Chapter 5.

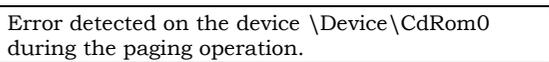
Fail to start the OS with the /3GB switch

→ System often fails to start the OS with the /3GB switch.

In this case, please adjust the capacity of the user mode area using the /userva switch in reference to the following URL.

<http://support.microsoft.com/kb/316739/en>

During installation, the following warning is registered in the System Log of the Event Viewer:



→ There is no problem on this issue.

Fail to start the OS:

- Is a floppy disk in the floppy disk drive?
 - Take out the floppy disk and restart the server.
- Is the NEC EXPRESSBUILDER DVD in the optical disk drive?
 - Take out the NEC EXPRESSBUILDER DVD and restart the server.
- Is the OS broken?
 - Use recovery process to recover the system.

The OS presents unstable operation:

- ❑ Did you update the system?
 - Installing a network drive after installation of the OS may cause unstable operation. Use the NEC EXPRESSBUILDER DVD to update the system. (See Chapter 6.)

The system does not restart automatically when a stop error occurs, though the system is adjusted to automatically restarting:

- When the system does not restart automatically, restart it manually.

The system restarts automatically when a stop error occurs, though the system is NOT adjusted to automatically restarting:

- There is no problem about this issue.
 - Check the System Event Log to confirm that STOP error occurred.

Cannot turn the power OFF at the blue screen:

- If you want to turn off the power at the blue screen, execute forced shutdown (forced shutdown: continue to press POWER/SLEEP switch for 4 seconds). The power will not be turned off if you press the switch for less than 3 seconds.

The PXE boot (network boot) fails or the server is not found on the network:

- ❑ Is the cable connected properly?
 - Connect the proper cable to the network port on the rear of the Express server. In addition, make sure that the used cable conforms to the network interface standard.
- ❑ Is BIOS configuration correct?
 - The internal LAN controller may be disabled with the BIOS SETUP utility of the server. Check the setting with the BIOS setup utility.
- ❑ Have the protocol and service already configured?
 - Install the distinctive network driver for the server. Make sure that the protocol, such as TCP/IP, and services are properly specified.
- ❑ Is the transfer speed correct?
 - Open the network property dialog box in control panel to specify the link speed and duplex value the same as the value specified for HUB.

The Telnet Service is not installed:

→ Adjust the computer name to 14 characters or less, and then install the Telnet Service according to <How to install the Telnet Service>.

<How to install the Telnet Service>

1. Click [Run] on Start menu.
2. Type "tntsvr /service" in the [Open] box, and click [OK].
3. Click Start menu, point to [Control Panel] and click [Computer Management] and then click the [Services] to specify whether the Telnet Service is registered.
 - * When the installation of Telnet Service is finished, there is no problem if the computer name is set to 15 characters or more.

Power ON/OFF (Wake On LAN) feature does not work:

→ Immediately after the AC power is turned on, the Remote Power ON/OFF feature (Wake ON LAN) is disabled. Start Windows Server 2003 once, provide settings as shown below, then shutdown the system. After restart, the Remote Power On/Off feature is available unless the AC power is turned off.

Select [Start] → [Administrative Tools] → [Computer Management].
Select Device Manager, double-click [Intel(R) PRO/1000EB Network Connection with I/O Acceleration #n] under Network Adapter, and specify as follows in [Detail] tab.

PME: [ON]
Wake On: [Magic Packet]

The system time lags:

→ If you do not use the server that adjust time such as NTP (Network Time Protocol) Server, the system time may differ from actual time.
In this case, use NTP server or disable "Windows Time Service".

Problems with RAID System and RAID Controller

Check the following if the server configuring a RAID System does not operate properly or a utility does not operate correctly. If a relevant item is found, follow the processing method.

Fail to install the OS:

- ❑ Is the RAID Controller configured?
 - Provide proper configuration for the RAID Controller by using the LSI Software RAID Configuration Utility or WebBIOS.

Fail to start the OS:

- ❑ Is the BIOS of the RAID Controller changed?
 - Set the BIOS correctly by using the LSI Software RAID Configuration Utility or WebBIOS.
- ❑ Does POST recognize the RAID Controller?
 - After making sure that the RAID Controller is connected correctly, then power on the server.

If the RAID Controller is not recognized correctly despite correct connection, the RAID Controller may be failed. Contact your service representative.

Rebuild fails:

- ❑ Is the capacity of the hard disk drive to be rebuilt sufficient?
 - The hard disk drive to be rebuilt should have the same capacity of the failed hard disk drive.
- ❑ Is RAID0 configured?
 - RAID0 has no data redundancy, therefore, Rebuild is disabled in the RAID0 configuration. Replace the failed hard disk drive, create the configuration data again and initialize the hard disk drives. Then recover the data by using backup data.

Auto rebuild fails:

- ❑ Was a sufficient time taken for hot swap of hard disk drives?
 - To allow the auto rebuild to operate correctly, it should take 90 seconds or longer for the interval between the removal of the failed hard disk drive and the installation of a new hard disk drive.
- ❑ Is configuration correct?
 - Check the setting of auto rebuild by using the LSI Software RAID Configuration Utility. <Menus to check: Top menu - [Objects] - [Adapter] - [Auto Rebuild]>

A hard disk drive fails:

- Contact your service representative.

Physical device is not correctly displayed on Universal RAID Utility:

→ If you use LSI Embedded MegaRAID™, a part of information on a physical device is not correctly displayed on Universal RAID Utility.

It is no problem.

The Onboard RAID Controller (LSI Embedded MegaRAID™) does not support RAID10, when using the hard disk drives with 2TB or larger size:

→ You cannot define the 2 virtual disks (VD) at the RAID10. When using the hard disk drive with 2TB or larger size, the size of the virtual disks (VD) will be one beyond about 4TB. But restriction of OS can use the virtual disks (VD) of which partition size is up to 2TB. Therefore, LSI Embedded MegaRAID™ does not support RAID10, when using the hard disk drives with 2TB or larger size. When using the hard disk drives with 2TB or larger size, trying to create RAID10 of LSI Embedded MegaRAID™ by the NEC EXPRESSBUILDER will fail with Error Code: 209.



Problems with N8190-127/131/153/154 Fibre Channel Controller

When N8190-127/131/153/154 is used, the names of the Fibre Channel controllers may appear with different names on Device Manager:

→ It is not a problem in operating the system. To display correct controller name, run following command in the driver software NEC EXPRESSBUILDER DVD and restart the system.

[Windows Server 2008 R2/Windows Server 2008 64-bit (x64) Edition]

<Drive Letter>:\018\win\winnt\ws2008x64\elxstor\friendlyname.exe

[Windows Server 2008 32-bit (x86) Edition]

<Drive Letter>:\018\win\winnt\ws2008\elxstor\friendlyname.exe

Problems with NEC EXPRESSBUILDER

When the server is not booted from the NEC EXPRESSBUILDER DVD, check the following:

- ❑ Did you set the NEC EXPRESSBUILDER during POST and restart the server?
 - If you do not set the NEC EXPRESSBUILDER during POST and restart the server, an error message will appear or the OS will boot.
- ❑ Is BIOS configuration correct?
 - The boot device order may be specified with the BIOS SETUP utility of the server. Use the BIOS SETUP utility to change the boot device order to boot the system from the optical disk drive first.
 - <Menu to check: [Boot]>
- ❑ Is the connected Flash FDD or inserted floppy disk formatted?
 - Make sure that the Windows recognizes that the connected Flash FDD or inserted floppy disk is formatted. If not, format it.
- ❑ If [Os installation ***default***] is selected at Boot selection screen, following message is displayed.
 - After this message appears, check the error and take the appropriate corrective action according to the message listed in the table below.

Message	Cause
This EXPRESSBUILDER version was not designed for this computer. Insert the correct version and click [OK]. (When you click [OK], the computer reboots.)	This NEC EXPRESSBUILDER version is not designed for this server. Execute the NEC EXPRESSBUILDER on the compliant server.
EXPRESSBUILDER could not get the hardware parameters written in this motherboard. This version is not designed for this computer or the motherboard may be broken. (When you click [OK], the computer reboots.)	This message is shown when NEC EXPRESSBUILDER could not find system-specific information because of mother board exchange and so on.
The hardware parameters written in this motherboard are incorrect. This version is not designed for this computer or the motherboard may be broken.	

- ❑ If the creation of the OEM-Disk for Windows failed, the following message will be displayed.
Confirm the message, and then try the solution described in the "Cause".

Message	Cause
The format went wrong. It is write-protected or the floppy disk may be damaged. Please check a floppy disk and perform creation of OEM-Disk again.	The Flash FDD or the floppy disk is write-protected. Cancel write-protected state. If you have already cancelled write-protected state, connect the USB floppy disk drive again.
Failed in the deletion of the file. Please confirm whether the media is not write-protected state or not.	

Problems with Autorun Menu

Cannot read documents:

- ❑ Do you have Adobe Reader installed correctly in your system?
 - Some documents are supplied with PDF format. To read the document of PDF format, Adobe Reader is required in your system.
- ❑ Is the operating system Windows XP SP2 (or later)?
 - With Windows XP SP2 (or later), the following information may appear in browser.

"To help protect your security, Internet Explorer has restricted this file from showing active content that could access your computer.

Click here for options..."

 1. Click the Information Bar.
The shortcut menu appears.
 2. Click [Allow blocked content].
The security alert dialog box appears.
 3. Click [Yes] on dialog box.

The menu fails to appear:

- ❑ Is your system Windows XP or later, or Windows Server 2003 or later?
 - The Autorun menu is supported by Windows XP/Windows Server 2003 or later.
 - If your system runs on Windows 2000, you need to setup IE6.0 before using the menu.
 - The menu is not available for Windows Server 2008 server core environment.
- ❑ Is Shift pressed?
 - Setting the DVD/CD with Shift pressed down cancels the Autorun feature.
- ❑ Is the system in the proper state?
 - The menu may not appear depending on the system registry setting or the timing to set the DVD/CD. In such a case, eject the disk from the disk drive once and insert it again.

Some menu items are grayed-out:

- ❑ Is your system environment correct?
 - The menu items are grayed-out when the logon user does not have the authority of the Administrator or the system does not meet the requirements to install the application. Login with the user having the proper authority on the proper system, and try again.

COLLECTING 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.

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 details))".

IMPORTANT:

- Consult with your service representative before dumping the memory. Dumping the memory while the server is in the successful operation may affect the system operation.
 - Restarting the system due to an error may display a message indicating insufficient virtual memory. Ignore this message and proceed. Restarting the system may result in dumping improper data.
-

Preparing for Memory Dumping

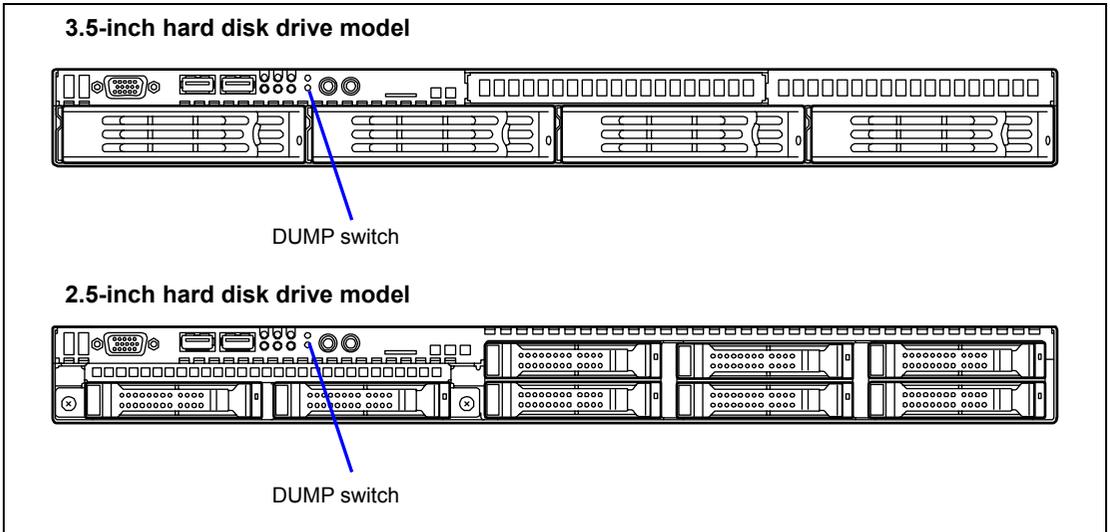
Memory dumping with the DUMP switch may disable the server to restart. In such a case, it is required to force the server to shut down. This forced shutdown, however, is not available if "Enable" is selected for "Power Switch Inhibit" on the Security menu of the BIOS setup utility, SETUP, because this 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.



Pressing the DUMP switch saves the dump file in the specified directory. (Memory dumping may not be available when the CPU stalls.)

IMPORTANT: Do not use a toothpick or plastic stick that is easy to break.

RECOVERY FOR Windows SYSTEM

If any file necessary for running the OS is damaged, use the following procedures to recover the system.

IMPORTANT:

- After recovering the system, see "Updating the System" in Appendix E, F, or G and be sure to update the system. Also, you need to update all the drivers after the system update. For more information, see "Installing and Setting Device Drivers" in Appendix E, F, or G.
 - If the hard disk drive can not be recognized, you can not recover the system.
-

For Windows Server 2008 R2, Windows Server 2008

If the system fails to start for some reason, rebuild the system using the recovery console. Note that this method is recommended for only users and administrators who have a thorough knowledge of the recovery console.

For more information, refer to Online Help.

For Windows Server 2003 x64 Editions

If the system fails to start for some reason, rebuild the system using the recovery console. Note that this method is recommended for only users and administrators who have a thorough knowledge of the recovery console.

For more information, refer to Online Help.

For Windows Server 2003

If the system fails to start for some reason, rebuild the system using the recovery console. Note that this method is recommended for only users and administrators who have a thorough knowledge of the recovery console.

For more information, refer to Online Help.

Maintenance Tools

The Maintenance Tools is a tool of this product prevention to maintain, and to analyze the trouble.

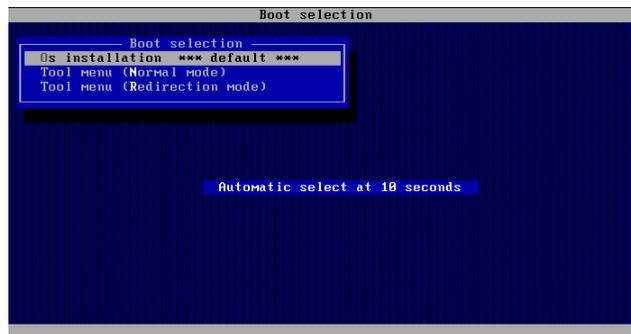
IMPORTANT: This guide contains procedures to use a floppy disk, however, your server is not equipped with factory-installed floppy disk drive and optical disk drive. Use the optional Flash FDD or USB FDD.

Starting Maintenance Tools

The Maintenance Tools is started according to the following procedure.

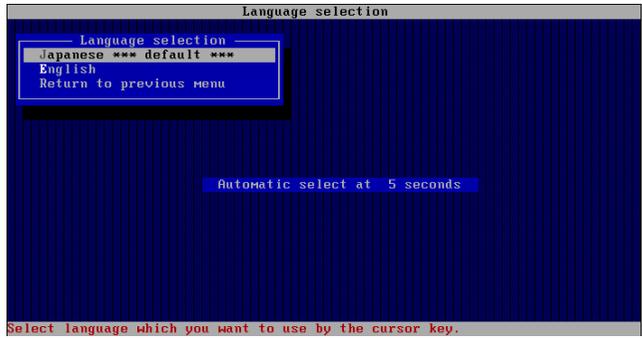
1. Turn on peripheral devices and the server in this order.
2. Insert the NEC EXPRESSBUILDER DVD supplied with your server into the optical disk drive of your server.
3. Press **Ctrl, Alt, and Delete** to reboot the server from the NEC EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)

System boots up displaying Boot selection menu.



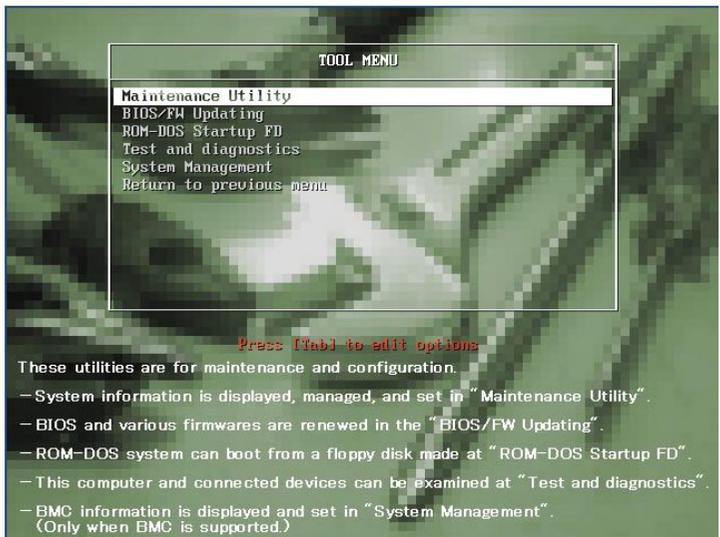
IMPORTANT: An initial selection of the menu is "Os installation". "Os installation" starts by the automatic after the Boot selection menu is displayed.

4. When a local console is used, "Tool menu (Normal mode)" is selected. Moreover, "Tool menu (Redirection mode)" is selected when using it with remote console.

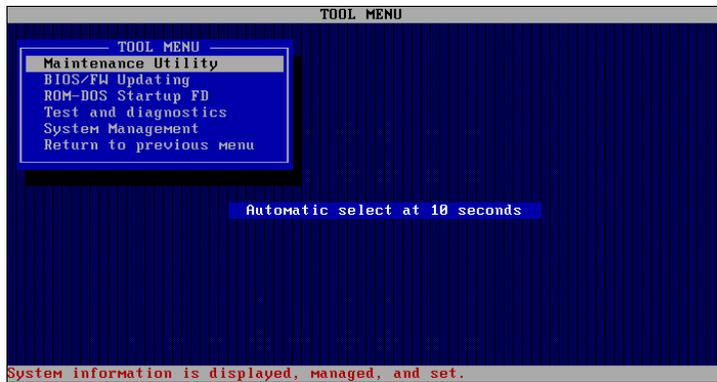


IMPORTANT: An initial selection of the menu is "Japanese".
"Japanese" starts by the automatic operation when the operation is not done for five seconds after the Language Selection menu is displayed.

5. "English" is selected.
The tool menu is displayed.



When you use a local console



When you use a remote console

6. Each tool is selected, and it starts.

Function of Maintenance Tools

The following functions can be executed in the Maintenance Tools.

- Maintenance Utility

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

IMPORTANT:

- The Off-line Maintenance Utility is intended for use of your service representative. The NEC EXPRESSBUILDER DVD you have created contain a file that describes operation of the utility, but do not attempt to use the utility by yourself. Contact your service representative and follow instructions.
 - See the on-line help for details of the Off-line Maintenance Utility. For further information, ask your service representative.
-

The Off-line Maintenance Utility provides the following features.

- IPMI Information Viewer

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

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

- BIOS Setup Viewer

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

- System Information Viewer

Provides the functions to view information on the processor and the BIOS and export it to a text file.

- System Information Management

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

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

Only the authorized personnel is allowed to restore the backup data.

- System Management

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

- BIOS/FW Updating

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

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

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

- ROM-DOS startup FD

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

- Test and diagnostics

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

After the Test and diagnostics is executed, a system check program assigned to each model starts. See Chapter 7 for details.

- System Management

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

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

Maintenance Tools with Remote Console

This subsection describes the procedures for using Maintenance Tools with remote console.

Maintenance Tools contains the remote console feature that allows the system administrator to set up the server from the management workstation (management PC) via the network or the server's COM B (serial) port.

IMPORTANT:

- Do not use this feature on any other computer than the server, or on any other server obtained without the NEC EXPRESSBUILDER. Doing so may cause a failure of the server.
 - Be sure to select [Tool menu (Redirection mode)] in [Boot selection] menu from the remote console.
-

Starting

The following two methods are available to start the server.

- Running Maintenance Tools from the management PC via LAN
- Running Maintenance Tools from the management PC via direct connection (COM B)

For the procedure for starting Maintenance Tools with Remote Console, refer to the online document of NEC ESMPRO Manager.

IMPORTANT:

- Do not change the boot device order in BOOT menu in BIOS SETUP. NEC EXPRESSBUILDER cannot be used if the optical disk drive is not the first device to launch the system.
 - Connect the LAN cable to the connector on management LAN port. Or, connect the LAN cable to LAN connector 1 if Shared BMC LAN feature is used.
 - Use the serial port B for direct connection.
 - To use this feature, you need to create a configuration file (3.5-inch floppy disk) that includes communication method between the server and the management PC, and various setup parameters. Use NEC ESMPRO BMC Configuration or NEC ESMPRO Agent Extension or run "System Management" menu from NEC EXPRESSBUILDER to create a configuration file. Save the configuration file into the root directory of the floppy disk as the following file name.
 - File name: CSL_LESS.cfg
 - If you exit the BIOS SETUP by unusual way (e.g., forced power-off or reset), the redirection process may fail. In such a case, setup again by using the configuration file.
 - On Windows Server 2008, you need to open Device Manager, disable the COM port, and reboot the system to use the direct connection through COM port.
-

NOTE: The following items of BIOS setup information will be set as shown below.

- LAN Controller: [Enabled]
 - Serial Port A: [Enabled]
 - Base I/O Address: [3F8]
 - Interrupt: [IRQ 4]
 - Serial Port B: [Enabled]
 - Base I/O Address: [2F8]
 - Interrupt: [IRQ 3]
 - BIOS Redirection Port: [Serial Port B]
 - Baud Rate: [19.2K]
 - Flow Control: [CTS/RTS]
 - Console Type: [PC ANSI]
-

RESETTING THE SERVER

If the server halts before starting the OS, press and hold **Ctrl** and **Alt** and press **Delete**. This restarts the server.

IMPORTANT: Resetting the server clears the DIMM memory and the data in process. To reset the server when it is not frozen, make sure that no processing is in progress.

FORCED SHUTDOWN

Use this function when an OS command does not shut down the server, the POWER 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 30 seconds after turning off the power (forced shutdown).

IMPORTANT: If the remote power-on function is used, cycle the power once to load the OS, and turn off the power again in the normal way.

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:

- Optional devices described in this chapter may be installed or removed by any user. However, NEC does not assume any liability for damage to optional devices or the server or malfunctions of the server resulted from installation by the user. NEC recommends you ask your service representative for installing or removing any optional devices.
 - Make sure to use only optional devices and cables authorized by NEC. Repair of the server due to malfunctions, failures, or damage resulted from installing such devices or cables will be charged.
 - For the Windows Server operating system user:
When you made any change to the hardware configuration, make sure to update the system (see Appendix E, F, or G for details.).
-

SAFETY NOTES

Observe the following notes to install or remove optional devices safely and properly.

⚠ WARNING	
	<p>Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-4 to 1-12 for details.</p> <ul style="list-style-type: none">■ Do not disassemble, repair, or alter the server.■ Do not remove the lithium battery.■ Disconnect the power plug before working with the server.

⚠ CAUTION	
	<p>Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details.</p> <ul style="list-style-type: none">■ Do not lift the server only by a single person.■ Make sure to complete board installation.■ Do not install the server on the rack leaving the cover removed.■ Do not install the server on the rack halfway.■ Do not pinch your fingers with mechanical component.■ Avoid installation in extreme temperature conditions.

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

Follow the procedure below to prepare for installing or removing components.

⚠ CAUTION	
	<p>Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-4 to 1-12 for details.</p> <ul style="list-style-type: none">■ Do not drop the server.■ Do not leave the server being pulled out from the rack.■ Do not install the server on the rack leaving the cover removed.■ Do not pinch your fingers with mechanical component.

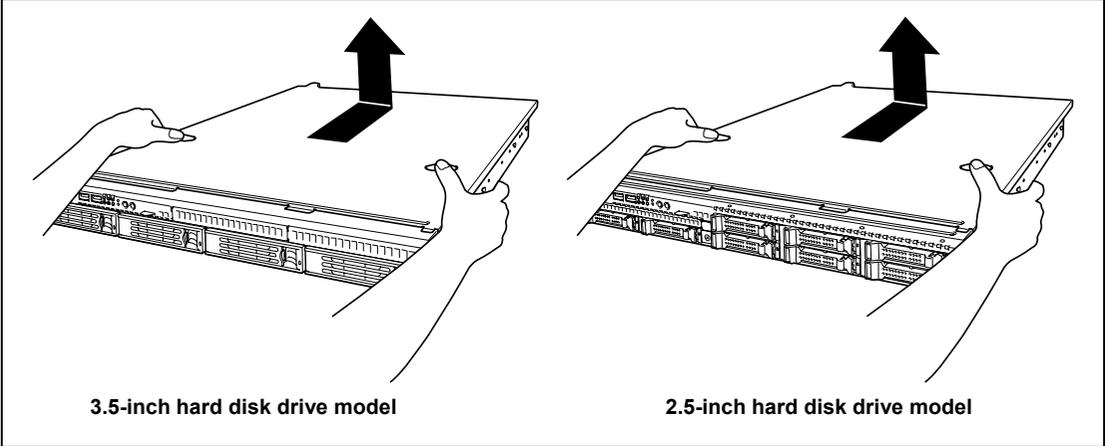
IMPORTANT: If you disconnect the power cord from the server, wait for about five seconds before proceeding to the next step. The components on mother board may be working for three to four seconds after the power cord is removed. Make sure that they surely stopped their operation.

1. Remove the server from the rack according to the procedure described in Chapter 3. Then, place the server on a flat and rigid desk.

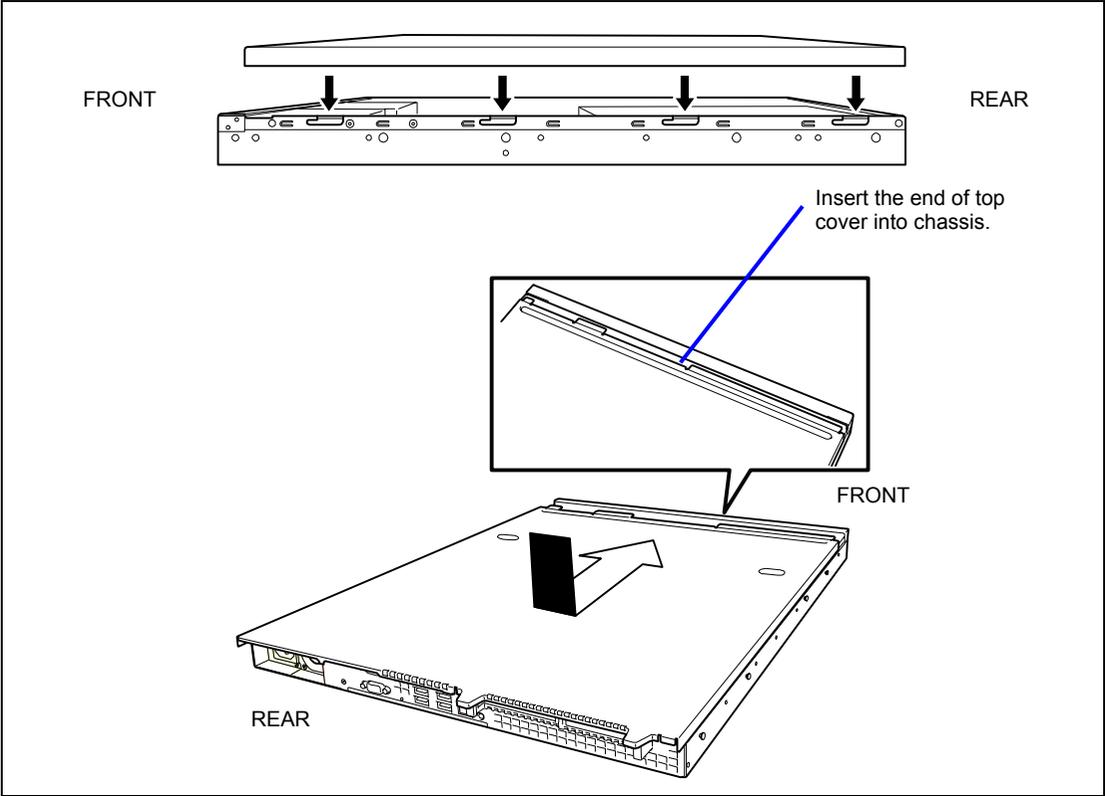
IMPORTANT: Do not leave the server being pulled out from the rack. Be sure to remove it from the rack.

2. Remove the top cover.

Put your finger in the hollow place and slide the cover toward the rear of the server, then lift the cover.



To install the top cover, make sure that the hooks on the top cover are inserted into the frame holes of the server certainly, and put the top cover on the server. Then move the top cover toward the front of the server.



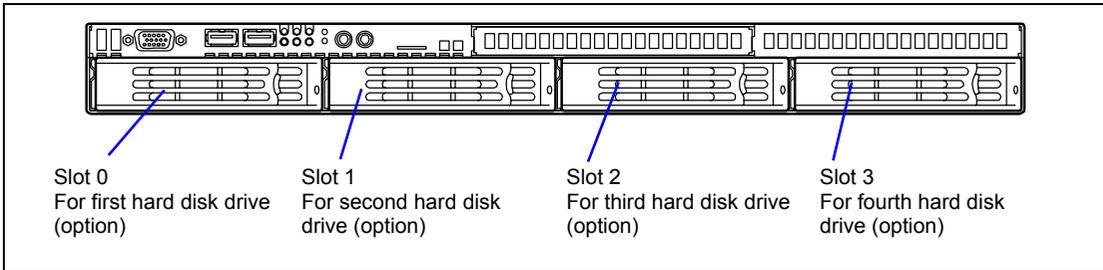
DEVICE INSTALLATION OR REMOVAL PROCEDURE

Install or remove a component from the server in the following procedure.

Hard Disk Drive

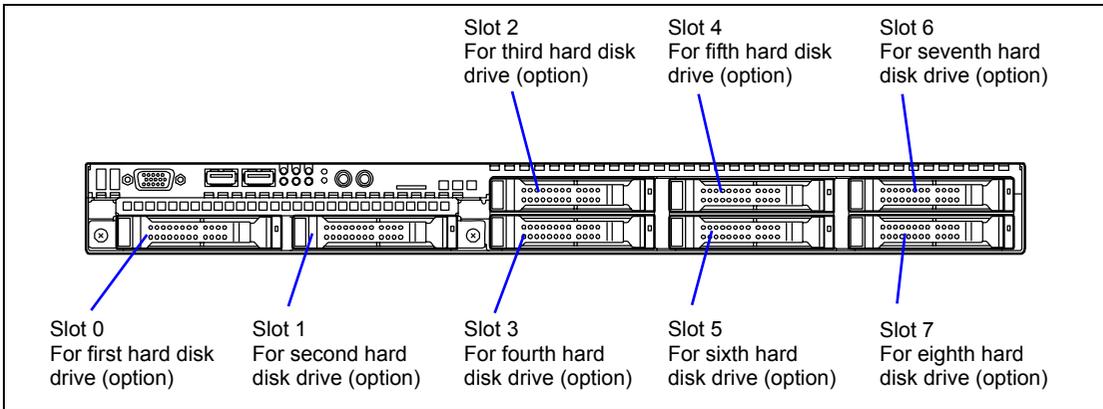
3.5-inch Hard Disk Drive Model

The server can contain up to four 3.5-inch hard disk drives.



2.5-inch Hard Disk Drive Model

The server can contain up to eight 2.5-inch hard disk drives.



IMPORTANT:

- Do not use any hard disk drives that are not authorized by NEC. Installing a third-party hard disk drive may cause a failure of the server as well as the hard disk drive.
- All hard disk drives must accept the same interface.

Installation

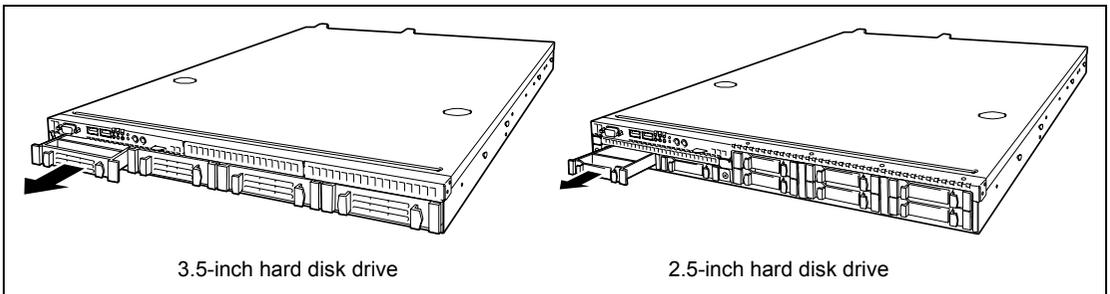
Follow the procedure as described below to install a hard disk drive.

1. Locate the slot in which you are going to install a hard disk drive.
 - 3.5-inch hard disk drive model
The server has four slots. Install hard disk drives starting from the leftmost slot.
 - 2.5-inch hard disk drive model
The server has eight slots. Install hard disk drives starting from the leftmost slot.

NOTE: With 2.5-inch hard disk drive model, the maximum number of operable hard disk drives depends on the controller being connected.
SATA controller on mother board: up to six hard disk drives
Optional disk array controller: up to eight hard disk drives

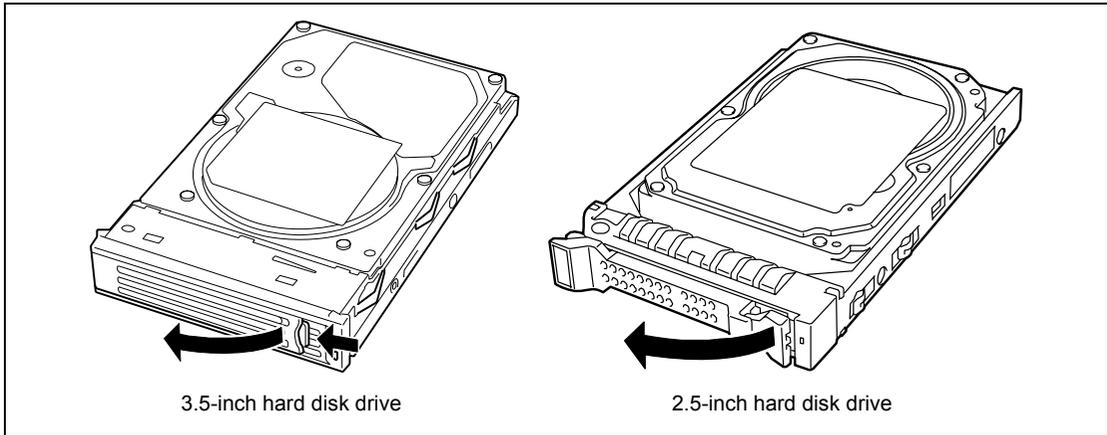
2. Remove the dummy tray.

Dummy trays are installed in all the hard disk drive bays.

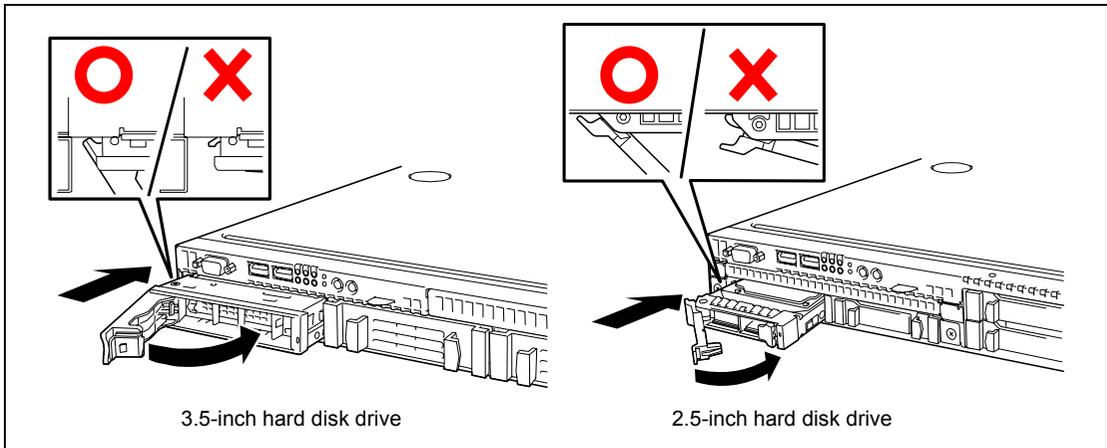


IMPORTANT: Keep the dummy trays for future use.

3. Unlock the hard disk drive carrier to let the handle open.



4. Firmly hold the drive carrier and the handle, and insert the drive carrier into the slot.



IMPORTANT:

- Push the hard disk drive carrier until the hook of the handle hits the frame.
 - Hold the hard disk drive carrier with both hands securely and carefully.
-

NOTE: The POWER switch is located close to the hard disk drive bay 0. Be careful not to press the POWER switch when installing or removing the hard disk drive. Otherwise, the system shutdown will occur.

5. Close the handle gently.

The handle is locked when a distinct "click" is heard.

IMPORTANT: Be careful not to get your finger caught between the handle and tray. Push the drive further to check if it is firmly secured.

NOTE: Make sure that the handle is hooked to the frame when having inserted the hard disk drive.

6. Power on the server. Run BIOS SETUP utility and set boot priority on the Boot menu. Installing a hard disk drive clears boot priority that has been stored in SETUP.

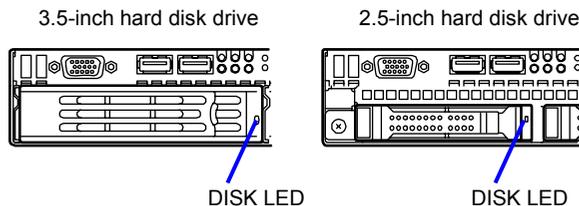
Removal

Follow the procedure as described below to remove hard disk drives.

IMPORTANT:

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

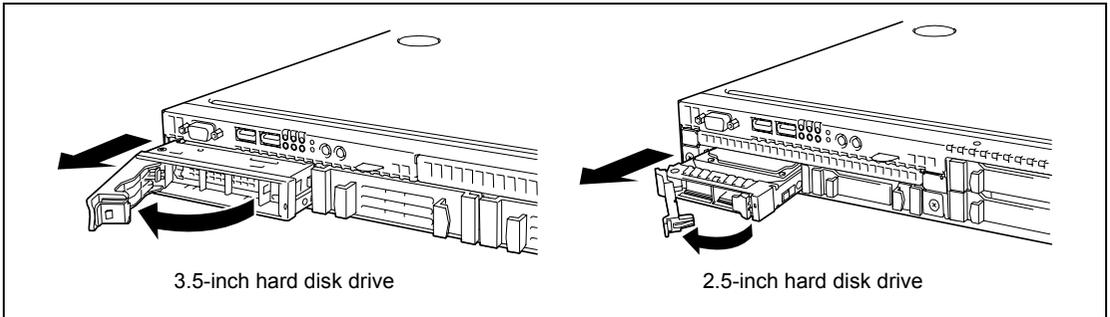
NOTE: If removing a failing hard disk drive, confirm the slot in which the DISK LED of the hard disk drive is amber before starting the removal.



-
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
 2. Push the lever to unlock, and open the handle.

NOTE: The POWER switch is located close to the hard disk drive bay 1. Be careful not to press the POWER switch when installing or removing the hard disk drive. Otherwise, the system shutdown will occur.

3. Firmly hold the handle and hard disk drive carrier, and pull out the hard disk drive.



4. If using the server with the hard disk drive removed, install the dummy tray in the empty slot.
5. Power on the server. Run BIOS SETUP utility and set boot priority on the Boot menu. Installing a hard disk drive clears boot priority that has been stored in SETUP.

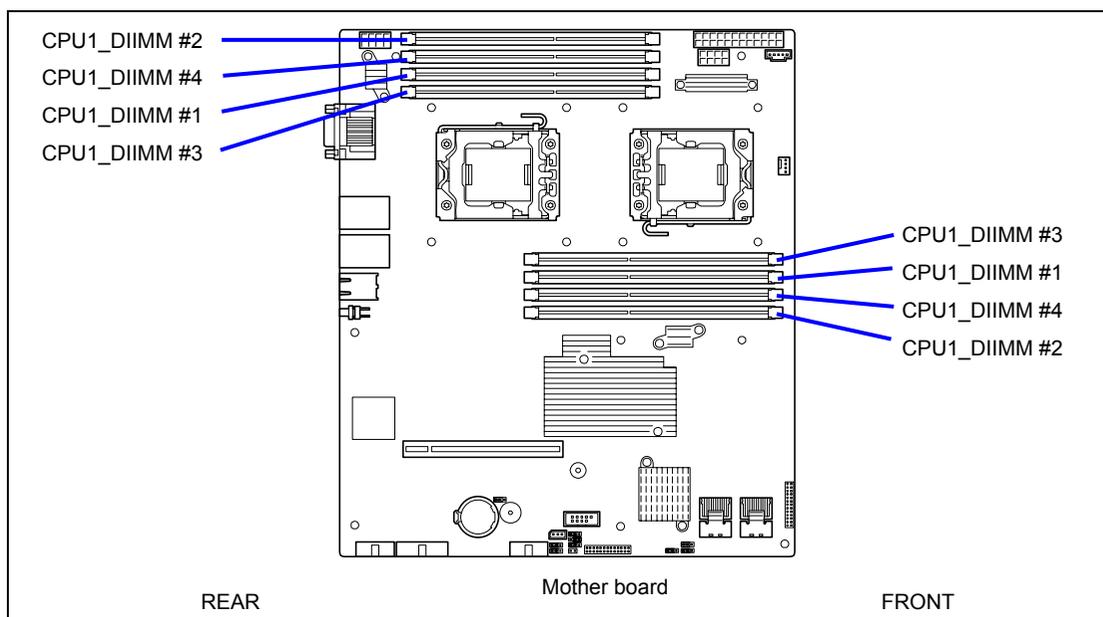
DIMM

Install the additional DIMM (Dual Inline Memory Module) to the DIMM sockets on the motherboard. The motherboard is provided with 8 DIMM board slots.

IMPORTANT:

- The DIMM is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the DIMM. Do not touch the DIMM terminals or on-board parts by a bare hand or place the DIMM directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.
- Make sure to use the DIMM authorized by NEC. Installing a third-party DIMM may cause a failure of the DIMM as well as the server. Repair of the server due to failures or damage resulted from installing such a board will be charged.
Purchase DIMMs of the following models:
 - N8102-412 Additional 1-GB memory board
 - N8102-413 Additional 2-GB memory board
 - N8102-414 Additional 4-GB memory board
 - N8102-411 Additional 8-GB memory board
- N8102-412/413/414 Additional memory board cannot be used together with N8102-411 Additional 8-GB memory board.

NOTE: Up to 64GB of memory (8GB DIMM × 8) can be installed.



Installation Order

Installation order depends on the number of CPUs installed.

- 1-CPU configuration:
Install DIMMs starting from the smallest slot number.
- 2-CPU configuration:
Alternately install DIMMs starting from the smallest slot number of each CPU.
- If DIMMs of different capacity are to be installed together, install DIMMs starting from the largest capacity, from the smallest slot number.

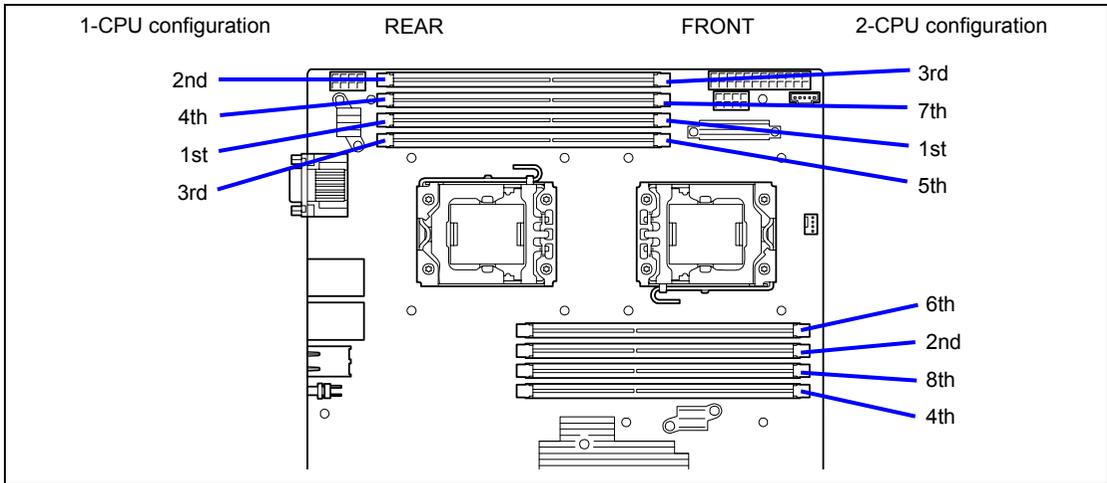
IMPORTANT: In 2-CPU configuration, the actual installation location differs from the indication on NEC ESMPRO as shown below.

- 1-CPU configuration:

	Installed slot	Indication on NEC ESMPRO
1st	CPU1_DIMM1 slot	Memory 1
2nd	CPU1_DIMM2 slot	Memory 2
3rd	CPU1_DIMM3 slot	Memory 3
4th	CPU1_DIMM4 slot	Memory 4

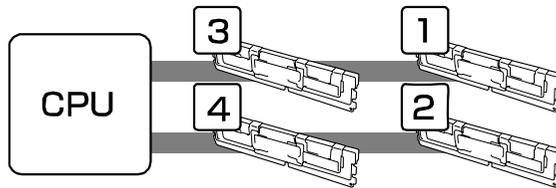
- 2-CPU configuration:

	Installed slot	Indication on NEC ESMPRO
1st	CPU1_DIMM1 slot	Memory 1
2nd	CPU2_DIMM1 slot	Memory 5
3rd	CPU1_DIMM2 slot	Memory 2
4th	CPU2_DIMM2 slot	Memory 6
5th	CPU1_DIMM3 slot	Memory 3
6th	CPU2_DIMM3 slot	Memory 7
7th	CPU1_DIMM4 slot	Memory 4
8th	CPU2_DIMM4 slot	Memory 8



IMPORTANT:

- If CPU2 is not installed, CPU2_DIMM1 through CPU2_DIMM4 are not available.
- If you are going to install N8102-340/341, install DIMMs starting from the smallest slot number.



Memory Clock

Memory clock speed depends on CPU model installed.

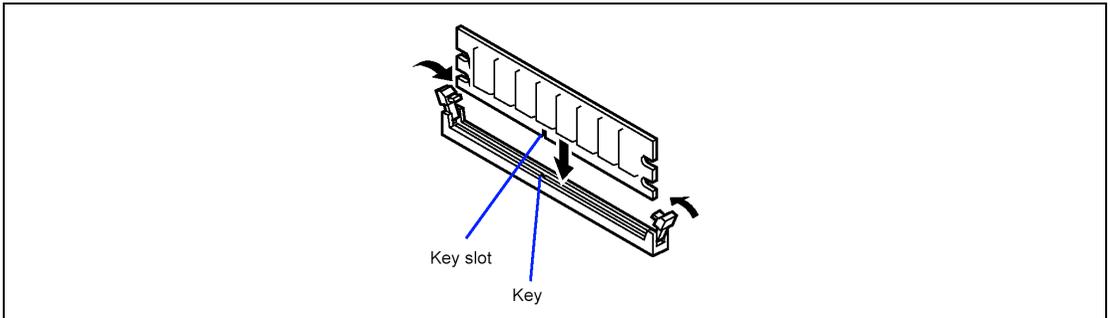
- Xeon L5630
Operates at 1066MHz.
- Xeon L5640
Operates at 1333MHz.

Installation

Install a DIMM in the following procedure.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Open the levers at both ends of the socket for the DIMM to be installed.

Push the DIMM to the socket straight.



NOTE: Make sure of the orientation of DIMM. The terminal side of the DIMM has key and key slot to prevent incorrect insertion.

If the DIMM is inserted into the DIMM socket, the lever is automatically closed.

3. Install the components you have removed in Step 1.
4. Power on the server. Make sure that no error message appears in the POST.
If POST displays an error message, take a note on the message and see the POST error messages listed in Chapter 8.
5. Run BIOS SETUP and select [Advanced] → [Memory Configuration] to verify that the installed DIMMs are detected by BIOS (shown on the screen). (See Chapter 4 for details.)
6. Select "Yes" for [Reset Configuration Data] on the [Advanced] menu.
This is required to update the hardware configuration information. See Chapter 4 for details.
7. Set the paging file size to the recommended value or a greater value.
See Appendix E, F, or G for details.

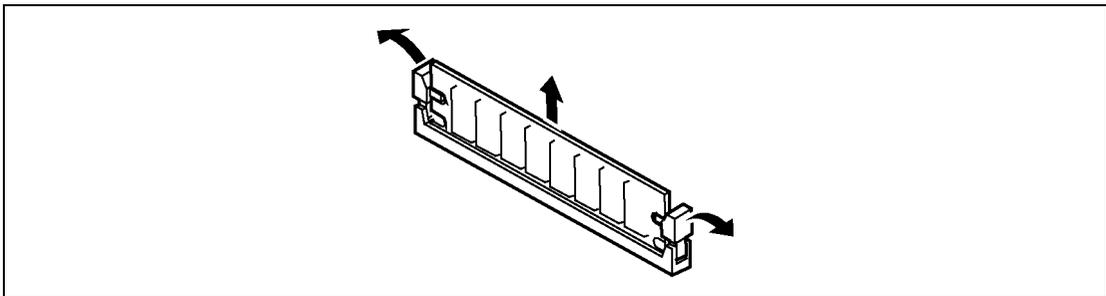
Removal

Remove the DIMM according to the following procedure.

NOTES:

- To remove the defected DIMM, check the error message appearing in POST or NEC ESM PRO to identify the DIMM socket in which the defected DIMM is installed.
 - The server needs at least one DIMM installed to operate.
-

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Open the levers at both ends of the socket for the DIMM to be removed.
The lock is released to allow the DIMM to be removed.



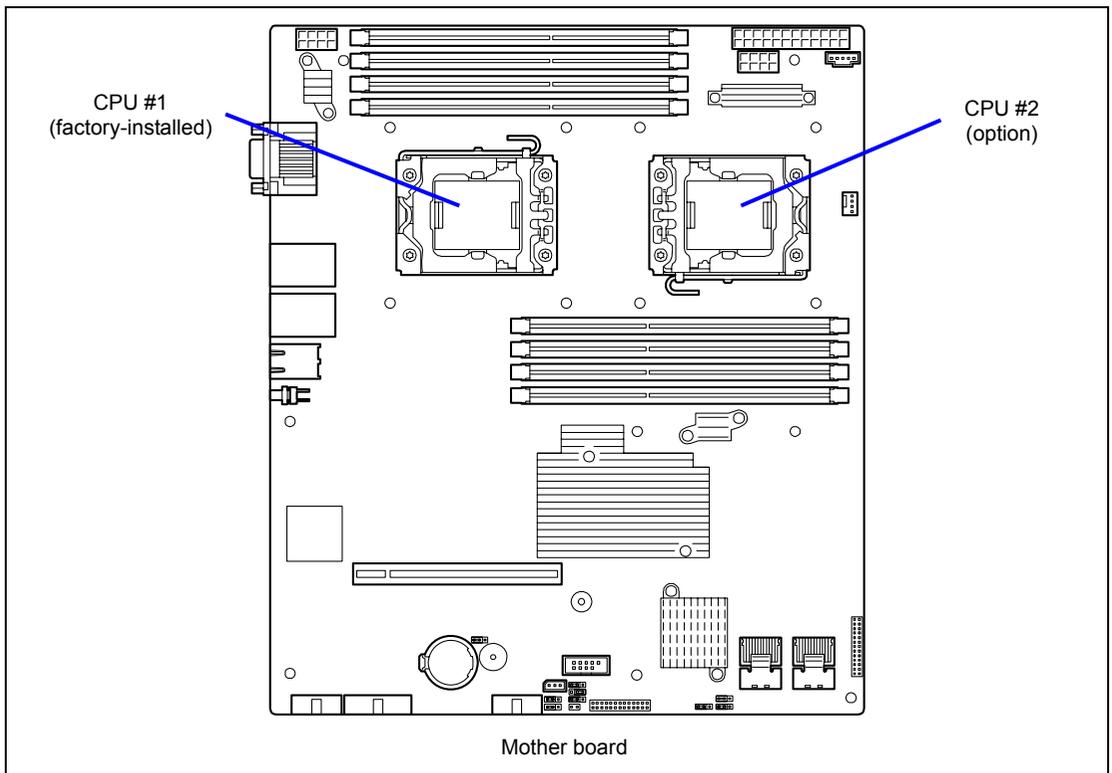
3. Install the components you have removed in Step 1.
4. Power on the server. Make sure that no error message appears in the POST.
If POST displays an error message, take a note on the message and see the POST error messages listed in Chapter 8.
5. Select "Yes" for [Reset Configuration Data] on the [Advanced] menu.
This is required to update the hardware configuration information. See Chapter 4 for details.
6. If you have replaced the failed DIMM with new one, run BIOS SETUP and select [Advanced] → [Memory Configuration] → [Memory Retest] → [Enabled], and reboot the server.
This is required to clear the error information of the removed DIMM. See Chapter 4 for details.
7. Set the paging file size to the recommended value or a greater value.
See Appendix E, F, or G for details.

Processor (CPU)

The server may have another CPU installed in addition to the factory-installed CPU (Intel® Xeon® Processor).

IMPORTANT:

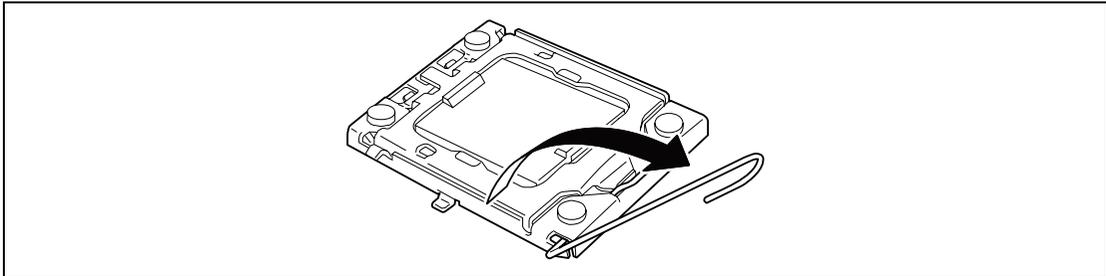
- The CPU is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the CPU. Do not touch the CPU pins by a bare hand or place the CPU directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.
 - Do not operate the system until confirming that the additionally installed CPU is in normal state.
 - Make sure to use the CPU authorized by NEC. Installing a third-party CPU may cause a failure of the CPU as well as the mother board. Repair of the server due to failures or damage resulted from installing such a board will be charged.
 - If you install an additional CPU, you need to change DIMM installation location. See "DIMM" for details.
-



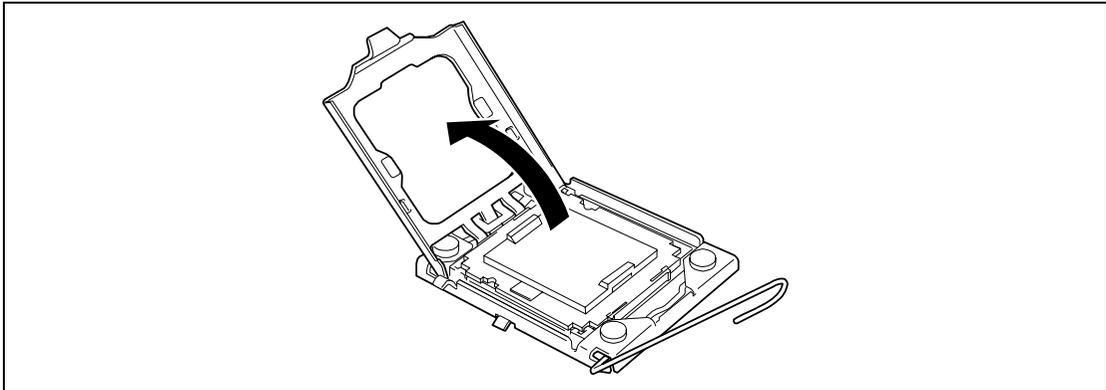
Installation

Install a CPU in the following procedure.

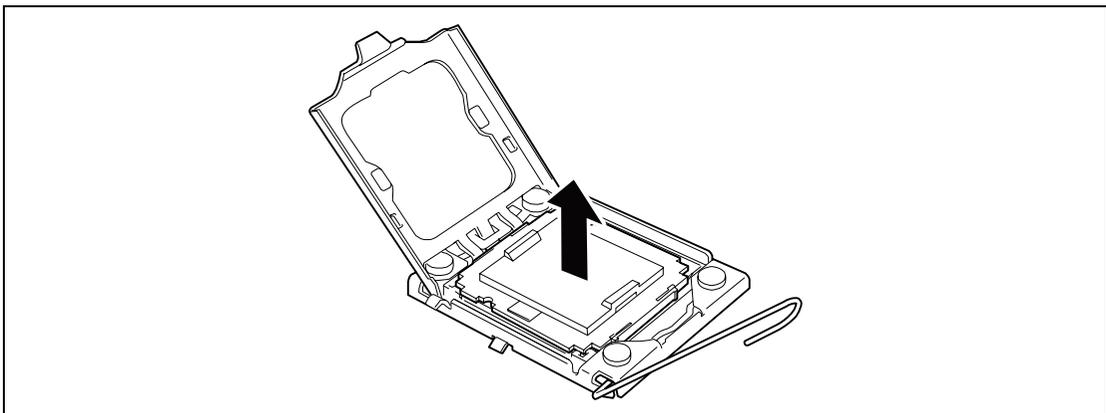
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Remove the duct cover.
3. Push the socket lever down to unlatch the socket from the hook, then slowly open the lever until it stops.



4. Lift the load plate.



5. Remove the protective cover from the socket.



IMPORTANT:

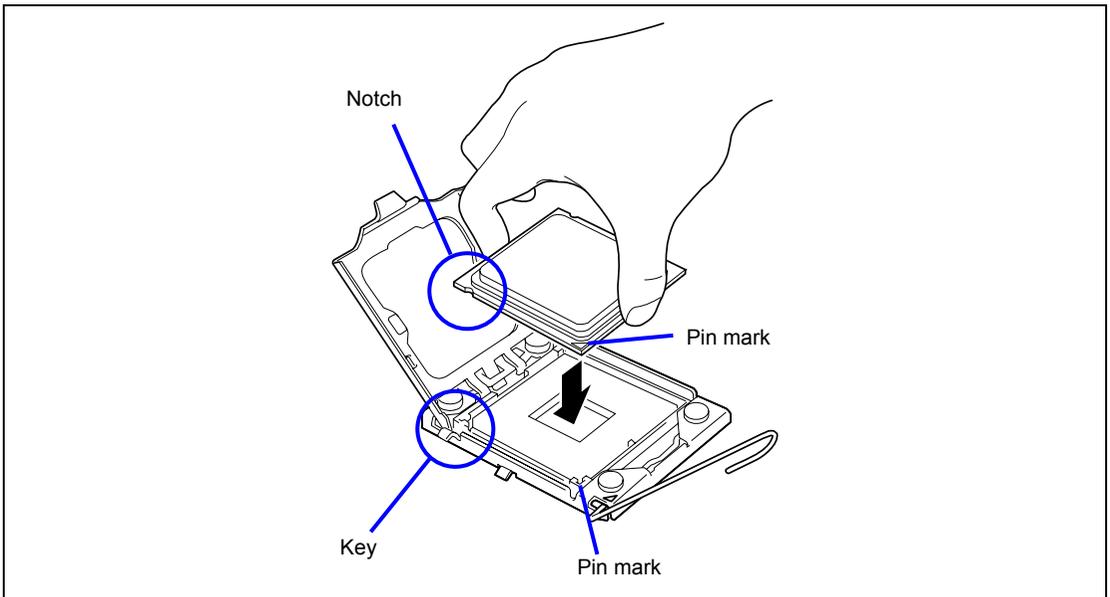
- Keep the protective cover for future use. Always mount the socket cover if the CPU is removed from the socket.
 - Do not touch the socket contacts.
-

6. Take out the new CPU and remove the protective cover.

IMPORTANT: Hold the CPU only at the edges. Be careful not to touch the bottom of the CPU (pin portion).

7. Place the CPU on the socket slowly and carefully.

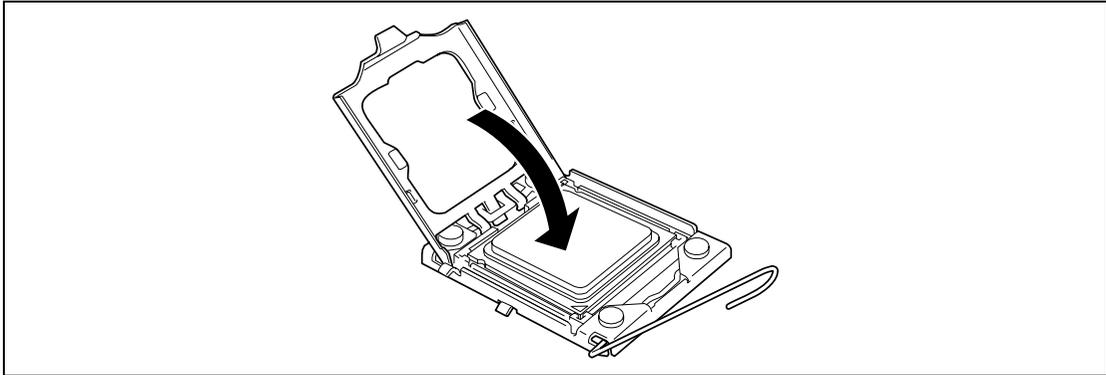
Hold the CPU with your thumb and index fingers oriented as shown in the figure below.



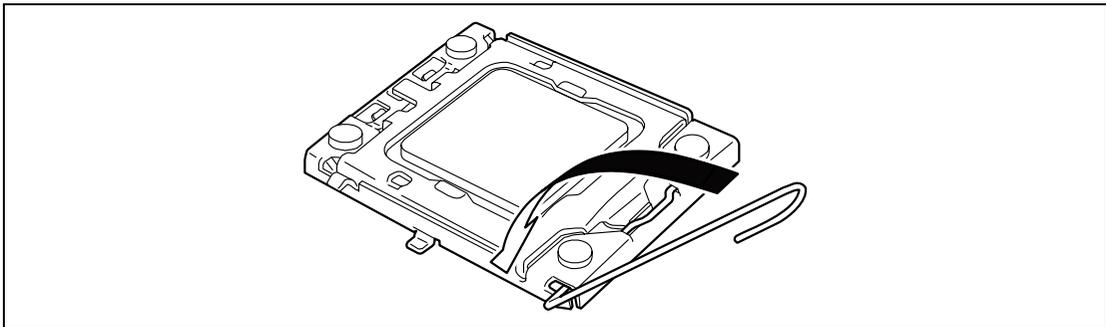
NOTES:

- Align notches with the key on the socket.
 - Bring the CPU straight down without tilting or sliding it in the socket.
-

8. Lightly press the CPU to the socket, then close the plate.

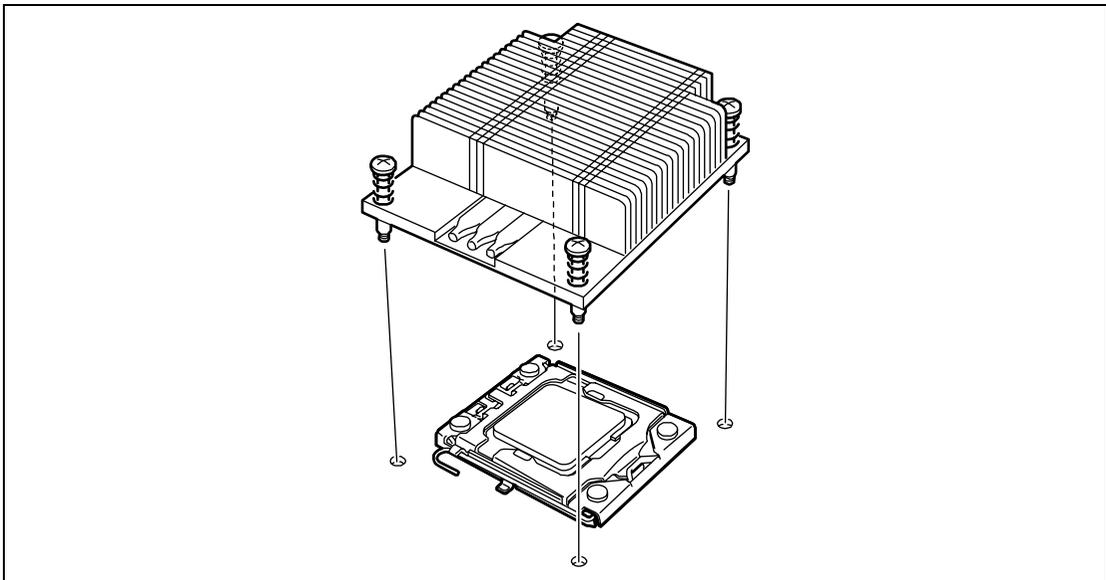


9. Bring down the lever to secure the CPU.

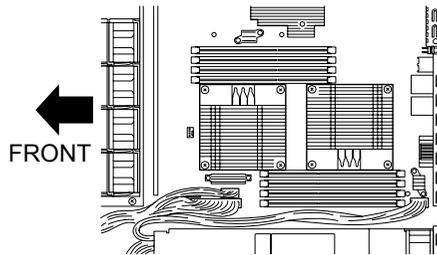


10. Remove the protective cover from the heat sink.

11. Put the heat sink on CPU.

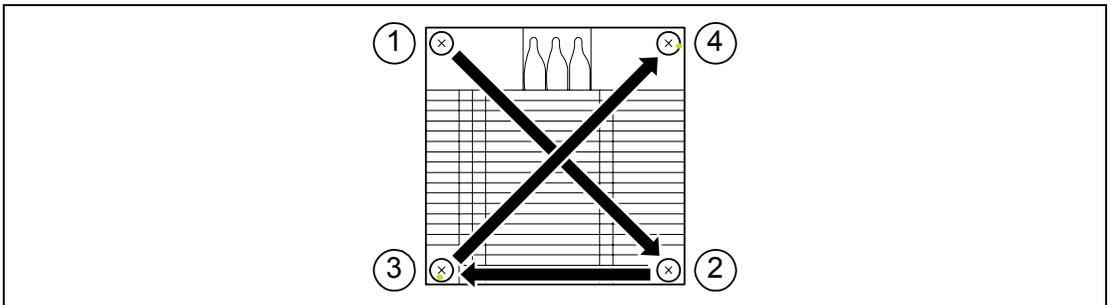


NOTE: The CPU must be installed in correct direction, as shown in the figure below.



12. Secure the heat sink with four screws.

Temporarily tighten the four screws on cater corner, then tighten them securely after making sure that the heat sink has been seated.



13. Make sure that the heat sink is level with the motherboard.

IMPORTANT:

- If the heat sink is not level, remove it, and then install it again. If the CPU is not positioned correctly, it causes the heat sink not to be level.
- Do not move the secured heat sink.
- If you install an additional CPU, you need to change DIMM installation location. See "DIMM" for details.

14. Install the duct cover, and secure it with a setscrew.

15. Set [Reset Configuration Data] on the [Advanced] menu to "Yes".

This is required to update the hardware configuration information. See Chapter 4 for details.

16. To add one or more CPUs to the server in 1-CPU configuration to operate the server with more than one CPU, do the following:

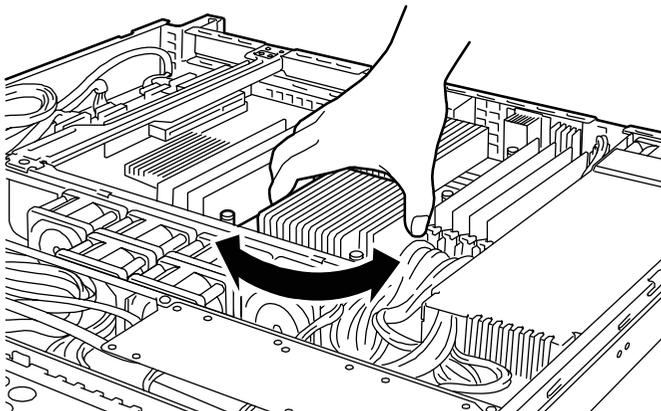
Change the driver of [Computer] in the [Device Manager] to [ACPI multi-processor PC] and then update the system (see Appendix E, F, or G).

Removal

To remove the CPU, prepare the removal referring to Steps 1 and 2 in the installation procedure and do the reverse procedure of steps 11 to 4. To remove the heat sink, remove the screw, then slide it a little on the level and remove it (see "IMPORTANT" below).

IMPORTANT:

- Do not remove any CPU unless it is failed.
- After the operation, heat may make the cool sheet 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. Run SETUP and select menus [Main] – [Processor Settings] to confirm that the ID, L2 Cache Size, and L3 Cache Size of the CPU are defined normally (see Chapter 4).
2. Set [Reset Configuration Data] on the [Advanced] menu to "Yes".

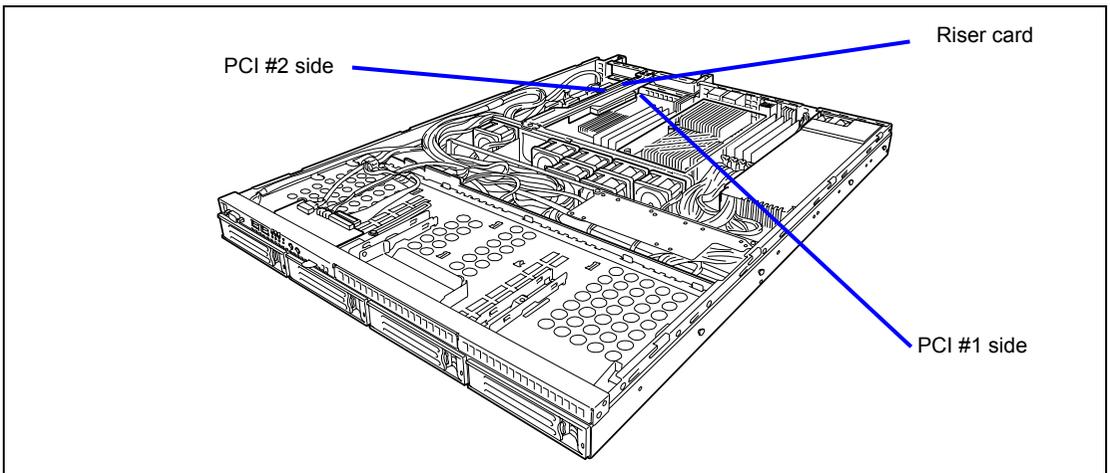
This is required to update the hardware configuration information. See Chapter 4 for details.

PCI Board

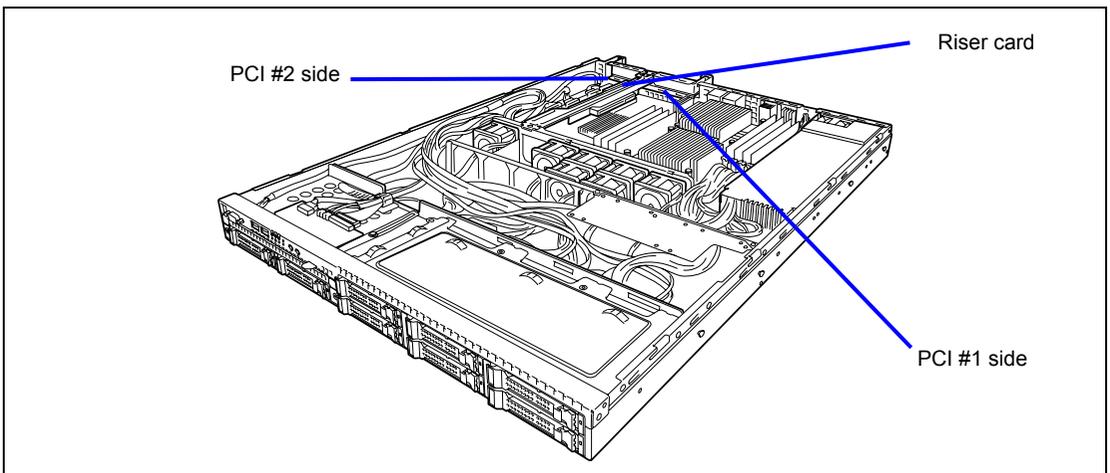
The server has a riser card assembly on the mother board. The riser card has two slots for PCI Express board.

IMPORTANT: Any PCI board or riser card is easily affected by static electricity. Handle a 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 or riser card. In addition, do not put them on a desk directly. See "Static Precautions" in this chapter for details of the static electricity.

3.5-inch hard disk drive model



2.5-inch hard disk drive model



N code	Riser card		Standard		Note
	Product name	PCI slot capacity	Slot (Bus A)	Slot (Bus B)	
			PCIe #1	PCIe #2	
		Slot size	x8 lane		
		PCI board type	x16 socket	x8 socket	
Available board size	200 mm max.				
N8103-107	SCSI controller (PCI EXPRESS (x1))		√	√	
N8103-104A	SAS controller (PCI EXPRESS (x8))		√	√	Cannot connect with internal hard disk drive.
N8103-129	RAID controller (256 MB, RAID0/1) (PCI EXPRESS 2.0 (x8))		–	√	For internal hard disk drive connection Additional battery [N8103-123] can be installed.
N8103-130	RAID controller (256 MB, RAID0/1/5/6) (PCI EXPRESS 2.0 (x8))		–	√	For internal hard disk drive connection Additional battery [N8103-123] can be installed.
N8103-134	RAID controller (512 MB, RAID0/1/5/6) (PCI EXPRESS 2.0 (x8))		–	√	For internal hard disk drive connection Additional battery [N8103-140] can be installed.
N8103-135	RAID controller (512 MB, RAID0/1/5/6) (PCI EXPRESS 2.0 (x8))		√	√	Cannot connect with internal hard disk drive. Additional battery [N8103-140] can be installed.
N8190-127	Fibre Channel controller (4Gbps/Optical) (PCI EXPRESS (x4))		√	√	Cannot be used together with N8190-153/154.
N8190-131	Fibre Channel controller (2ch) (4Gbps/Optical) (PCI EXPRESS (x4))		√	√	Cannot be used together with N8190-153/154.
N8190-153	Fibre Channel controller (8Gbps/Optical) (PCI EXPRESS 2.0 (x8))		√	√	Cannot be used together with N8190-127/131.
N8190-154	Fibre Channel controller (2ch) (8Gbps/Optical) (PCI EXPRESS 2.0 (x8))		√	√	Cannot be used together with N8190-127/131.
N8104-126	1000BASE-T adapter (PCI EXPRESS (x1))		√	√	Teaming with another N8104-126 (AFT/SFT/ALB) is allowed. Teaming with any other NIC (FEC/GEC) is not allowed. 10BASE-T is not supported.
N8104-122	1000BASE-T adapter (2ch) (PCI EXPRESS (x4))		√	√	Teaming with another N8104-122 (AFT/SFT/ALB) is allowed. Teaming with any other NIC (FEC/GEC) is not allowed. 10BASE-T is not supported.
N8104-125A	1000BASE-T adapter (4ch) (PCI EXPRESS (x8))		√	√	For adding a LAN 10BASE-T is not supported. A LAN cable with a hook cannot be used.
N8104-123A	10GBASE-SR adapter (PCI EXPRESS (x8))		√	√	1 max.
N8104-128	Standard port for connecting 10GBASE-SR (SFP+/2ch) (PCI EXPRESS (x8))		√	√	For adding a LAN An SFP module must also be installed.
N8117-01A	Additional RS232C connector kit		√	√	1 max.

√: Available, –: Unavailable

NOTE: Set "Disabled" for the Option ROM Scan of the PCI slot connected with non-bootable device by using BIOS SETUP utility. Disabling Option ROM Scan saves memory consumption and time for startup.

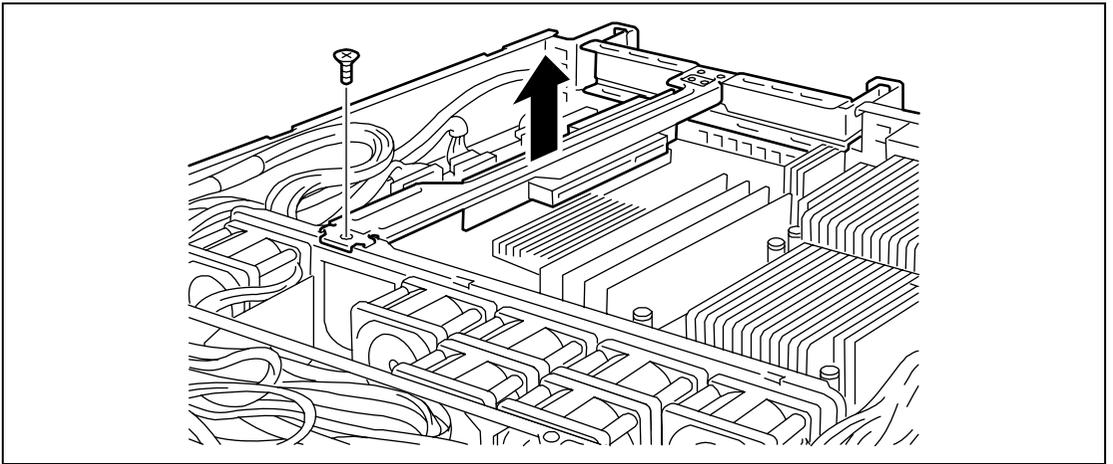
Installation

Install the board in PCI board slot in the following procedure.

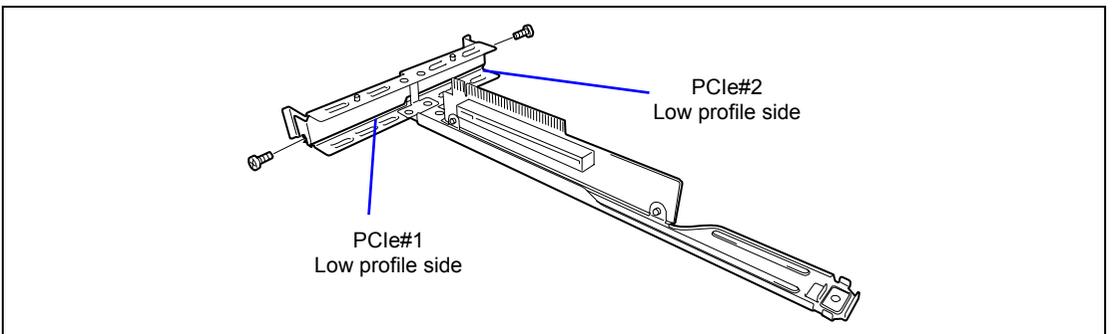
NOTE: When installing a PCI board, make sure that the board connector matches the connector of the PCI board slot.

IMPORTANT: The server can contain a short-type PCI board only, not the long-type one.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Remove a fixing screw from the riser card. Hold both ends of the riser card assembly and lift straight up and remove the riser card from the server.



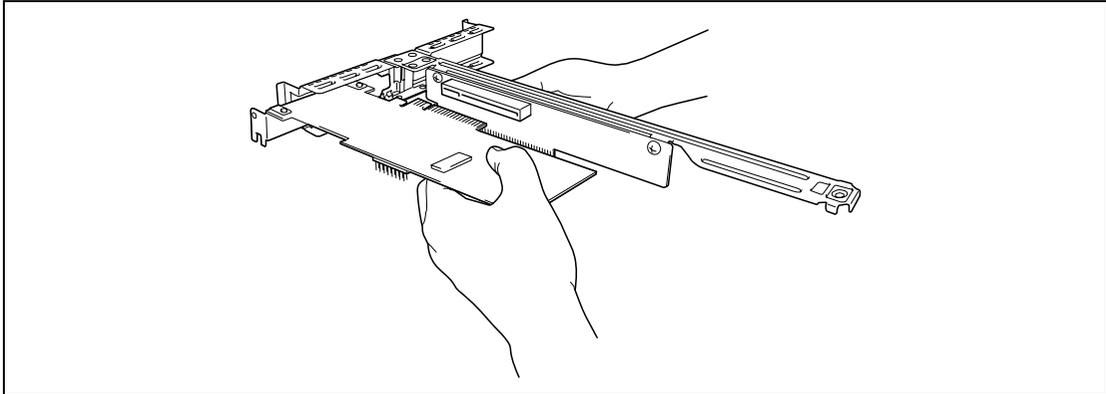
3. Remove the screw from the riser card, and remove the additional slot cover.



IMPORTANT: Keep the removed additional slot cover for future use.

4. Install the PCI board on the riser card.

Align the PCI board terminal section with the riser card slot, and firmly push the PCI board until it is fully seated.

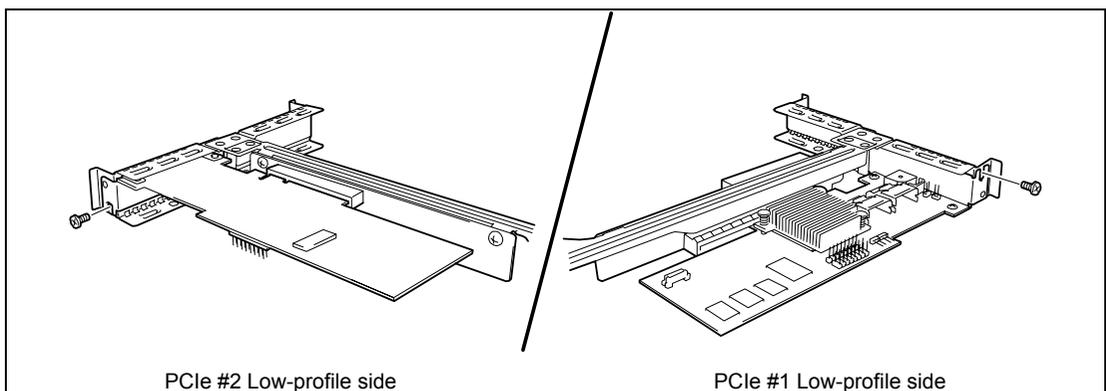


IMPORTANT:

- Do not touch the terminals of the riser card and PCI board and the leads of electronic components with your bare hand. Fingerprints and dust left on them cause the server to malfunction due to a connection failure or damage to the leads.
 - If the board cannot be installed well, remove the board once and then install it again. Note that adding an excess force to the board may cause it to be damaged.
-

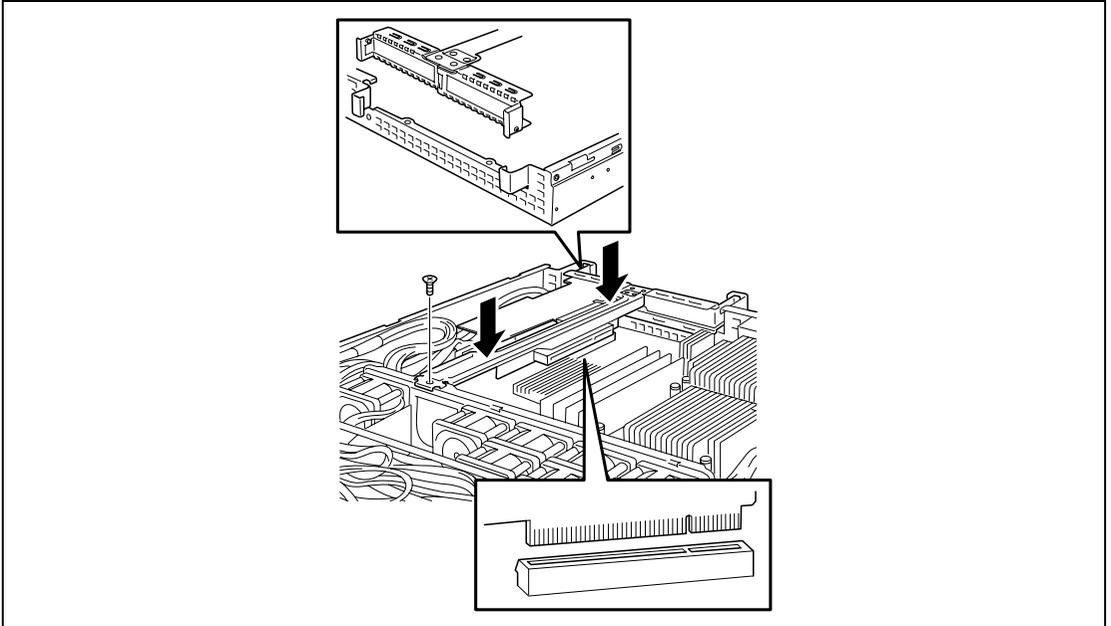
NOTE: Confirm that the end of the PCI board bracket is inserted in the frame slot of the riser card.

5. Secure the PCI board with the screw you removed in Step 3.



6. Insert the riser card assembly into the slot on the mother board.
Secure the riser card with a screw removed in Step 2.

Align the riser card terminal section with the slot on the mother board, and firmly push the riser card until it is fully seated.



NOTE: There are catches on the riser card frame that are used to secure the riser card to the chassis. When inserting the riser card, confirm that the catches are correctly fit into the holes of the chassis. After the insertion, push the riser card with your fingers until you cannot see any part of the riser card terminal section. The riser card is now fully seated in the slot.

7. Install the components you have removed in earlier steps.
8. Power on the server. Make sure that no error message appears in the POST.
If an error message appears, write down the message and contact your service representative for the maintenance.
9. Run BIOS SETUP Utility to set the [Reset Configuration Data] in the [Advanced] menu to "Yes".

This is required to update the hardware configuration information. See Chapter 4 for details.

Some PCI boards use an on-board expanded ROM. See the manual provided with the PCI board to determine whether expanded ROM needs to be loaded.

Removal

Remove a PCI board in reverse order of the installation steps.

Remove a PCI board by holding it securely. Ask any other person to hold the server not to move during removal of the board.

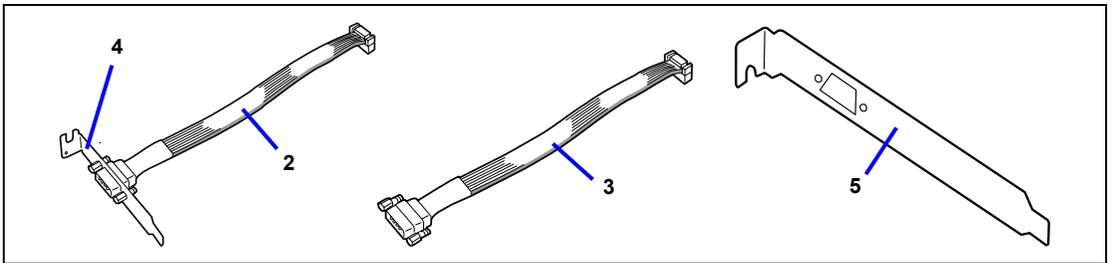
If you do not install the board after removal, be sure to install the additional slot cover of the riser card on the slot from which you remove the board. Secure the additional slot cover with screw.

IMPORTANT: Run BIOS SETUP utility, select "Yes" for [Reset Configuration Data] in the [Advanced] menu to update the hardware configuration data.

Installing N8117-01A

The shipping carton contains the following components.

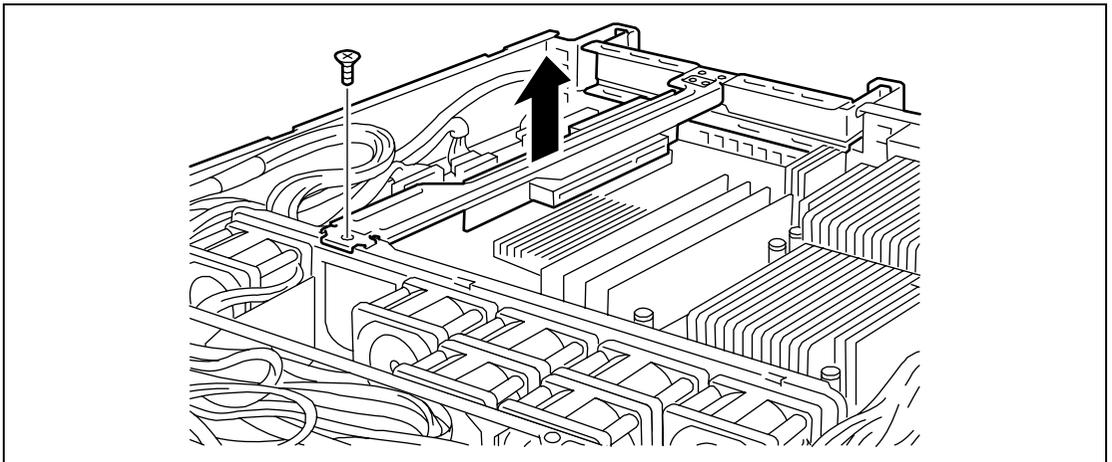
Item No.	Name	Specification No.	Q'ty	Remarks
1	RS-232C Connector Kit Handling Guide	856-125671-002	1	
2	RS-232C cable (A)	804-063264-020	1	
3	RS-232C cable (B)	804-062746-820	1	
4	PCI bracket (1)	243-112122-001	1	Attached to the cable
5	PCI bracket (2)	243-112122-002	For Full Height PCI board	



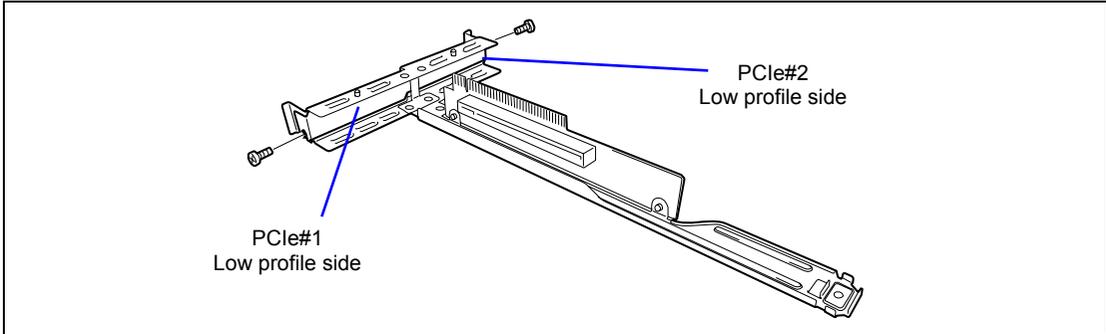
Use Item No. 3 (RS-232C cable (B)) and No. 4 (PCI bracket (1)).

Install N8117-01A in the following procedure.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Remove a fixing screw from the riser card. Hold both ends of the riser card assembly and lift straight up and remove the riser card from the server.

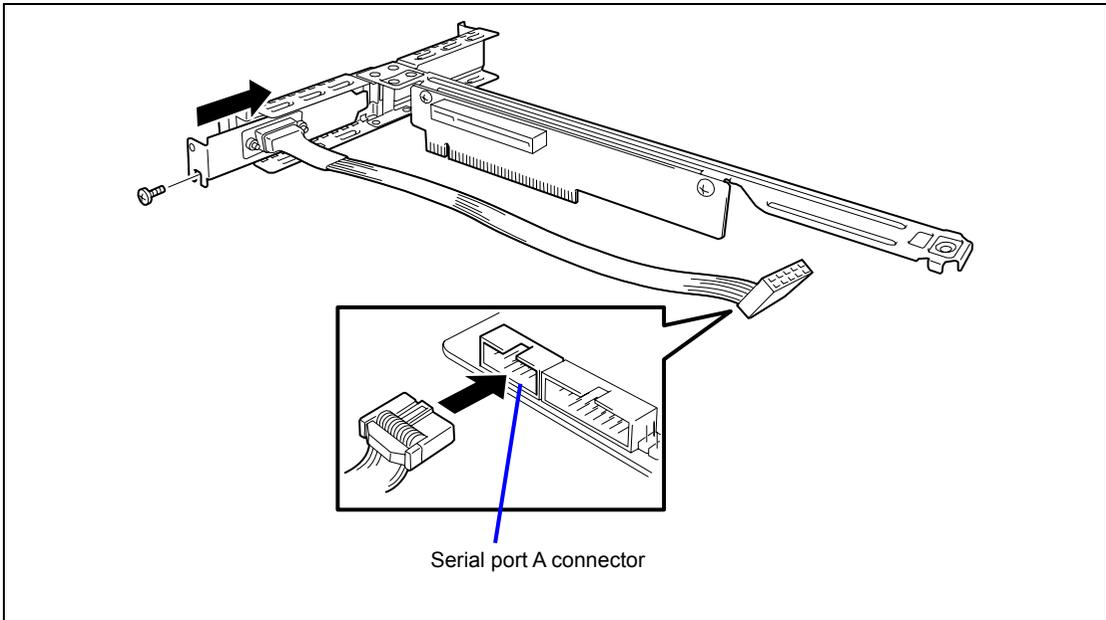


3. Remove the screw from the riser card, and remove the additional slot cover.



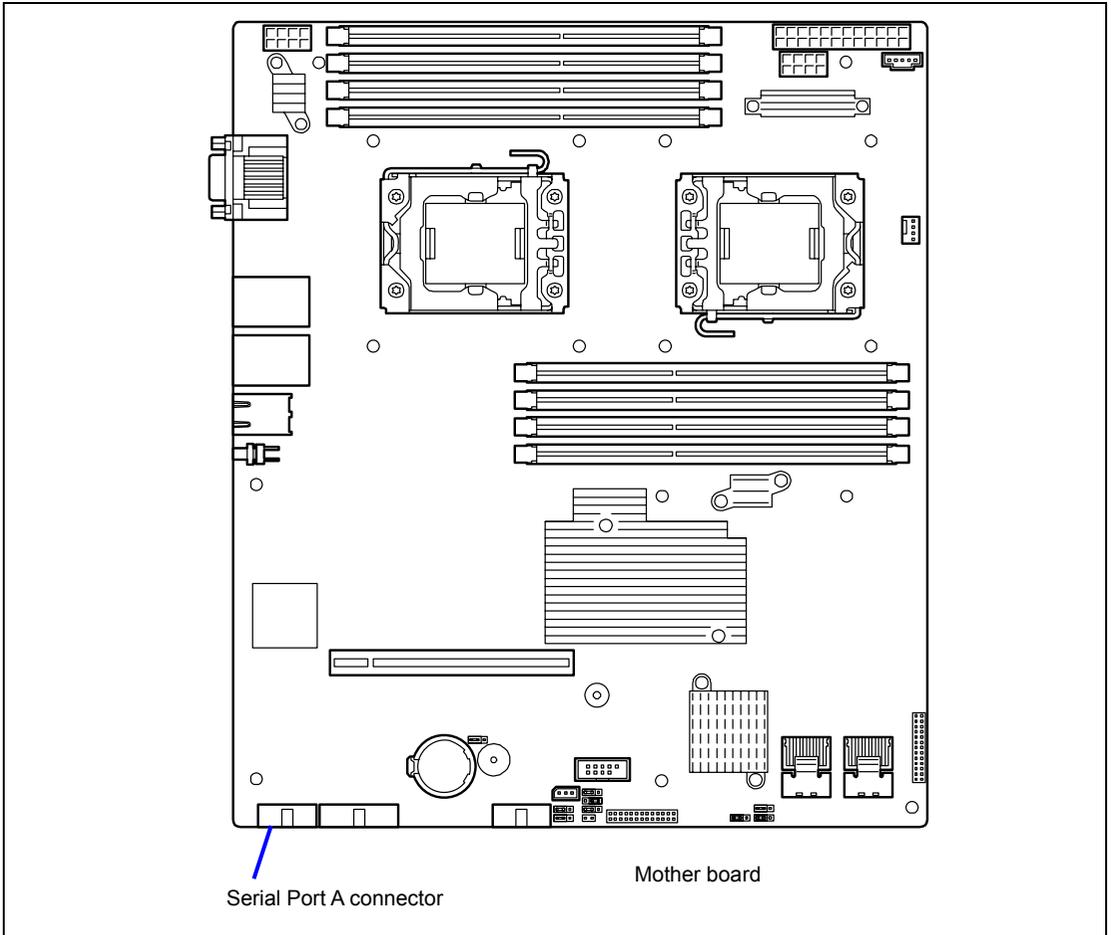
IMPORTANT: Keep the removed additional slot cover for future use.

4. Install the PCI bracket firmly, and secure it with the screw removed in Step 3.



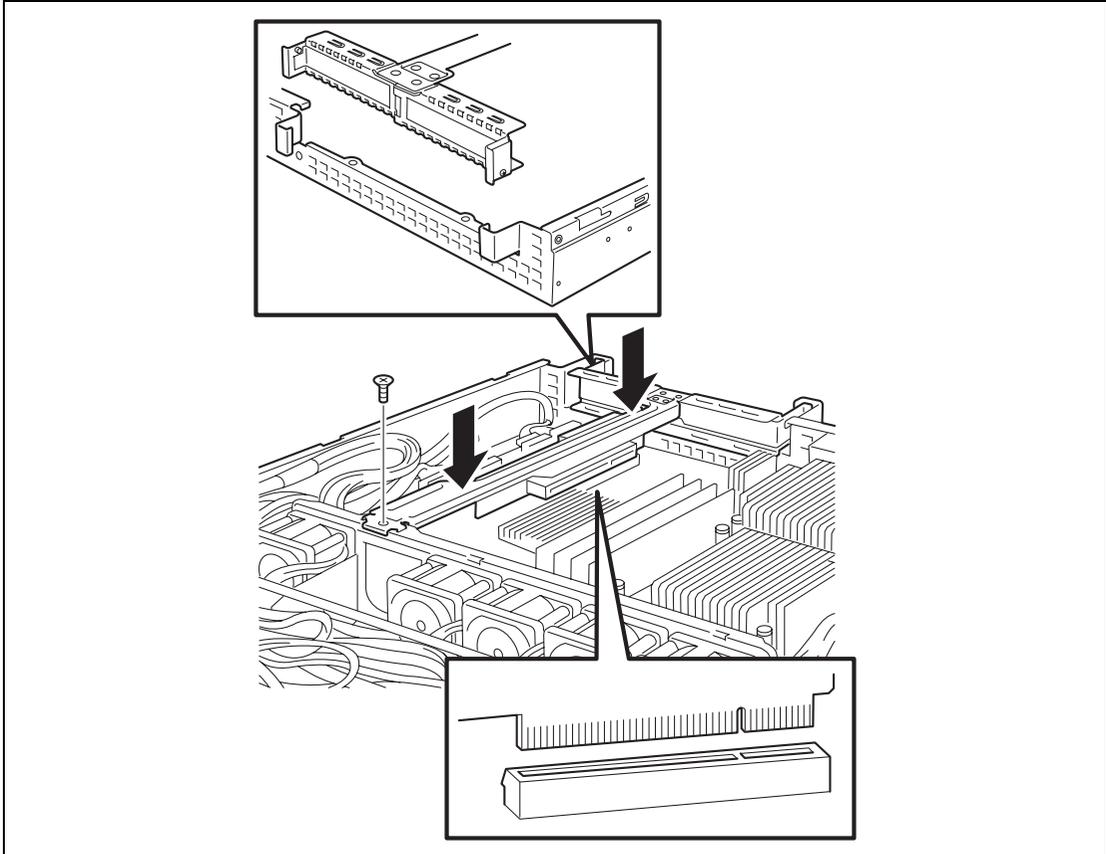
5. Route the cable so that it does not interfere with the other PCI board, and connect the cable to the Serial Port A connector on mother board.

Connect the cable properly by making sure the polarity of connector. See the figure below for location of Serial Port A connector.



6. Insert the riser card assembly into the slot on the mother board.
Secure the riser card with a screw removed in Step 2.

Align the riser card terminal section with the slot on the mother board, and firmly push the riser card until it is fully seated.



7. Make sure that the removed slot cover, screw, or tools are not left in the server. Then, reassemble the server.
8. Run BIOS SETUP Utility and select [Advanced] - [Peripheral Configuration] - [Serial Port A] - [Enabled].

When set to [Enabled], menus [Base I/O Address] and [Interrupt] are additionally displayed.

The factory-set value for these parameters are:

Base I/O Address: 3F8H

Interrupt: IRQ 4

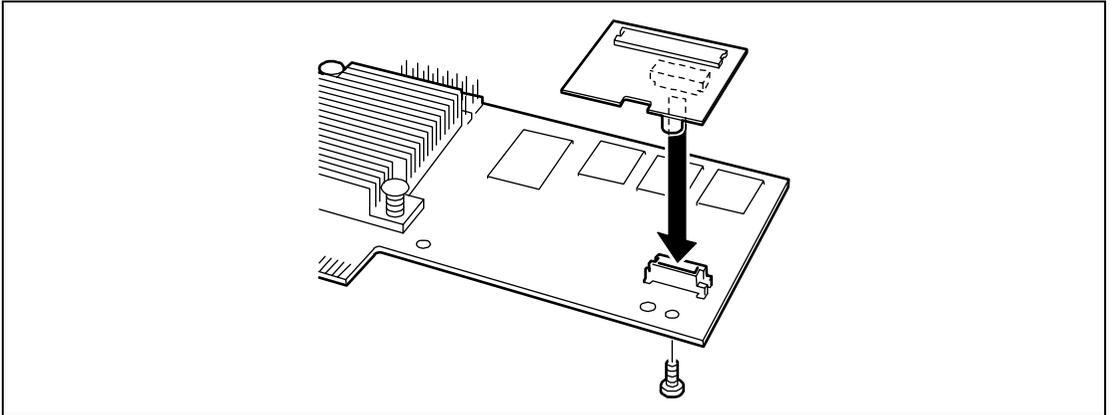
Additional Battery Unit for RAID Controller

Install an additional battery in the RAID Controller (N8103-129/130/134) as shown below.

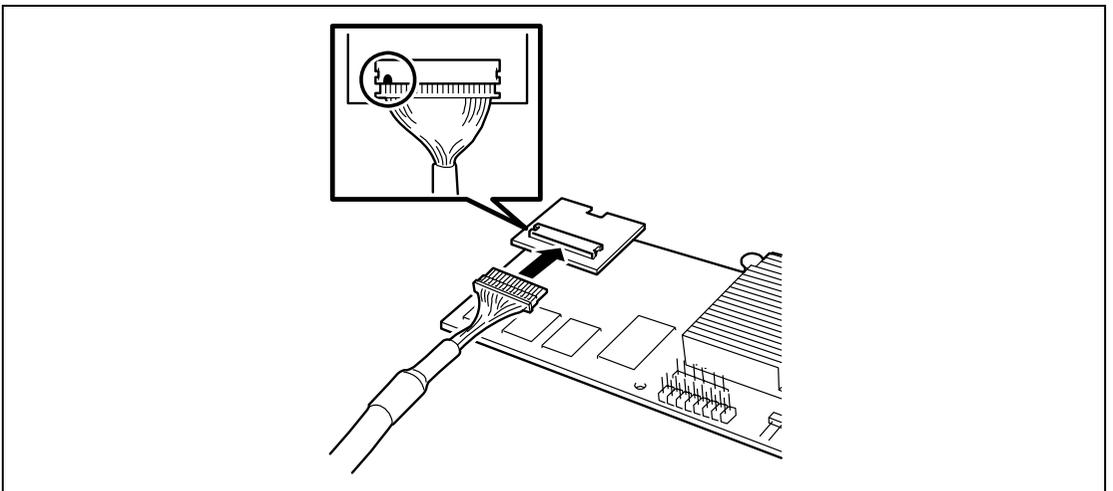
For N8103-123 (a battery for the N8103-129/130 RAID Controller)

Installation

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Remove the duct cover.
3. Install the battery connection board that comes with additional battery to the RAID Controller.

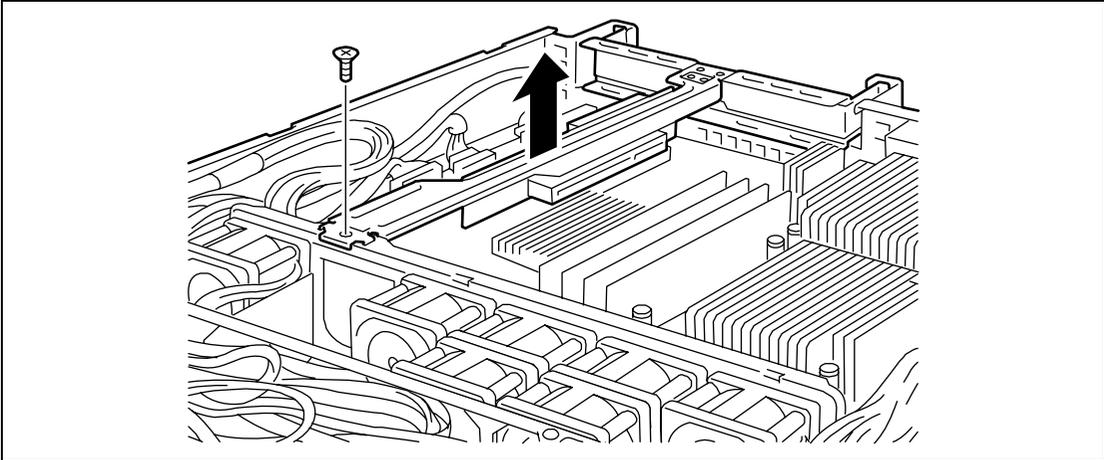


4. Connect the cable to the battery connection board.
Make sure the markings on connector and that on the cable.

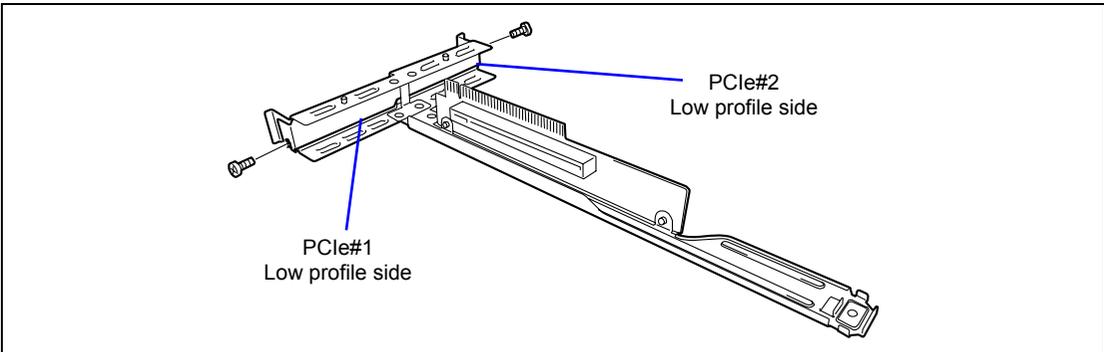


IMPORTANT: For N8103-115 RAID Controller, use the cable of 750 mm length (804-063451-075-A).

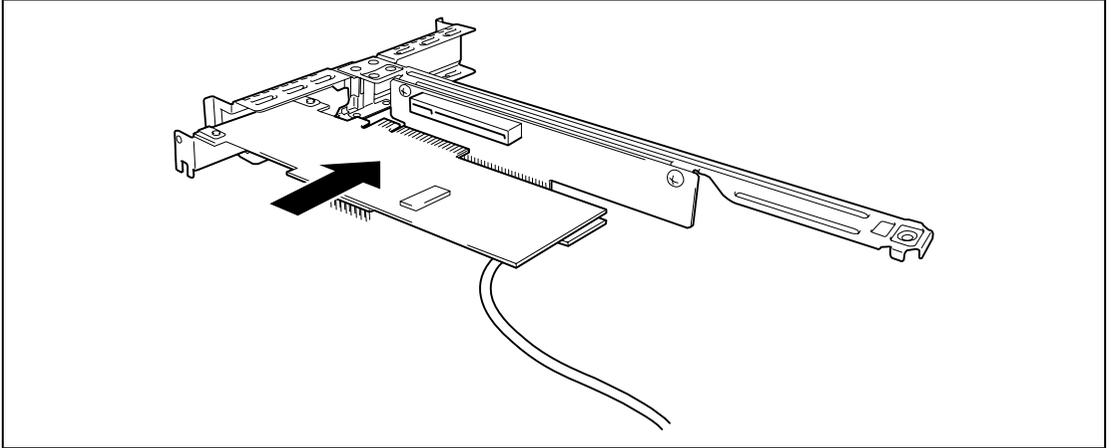
5. Remove a fixing screw from the riser card. Hold both ends of the riser card assembly and lift straight up and remove the riser card from the server.



6. Remove the screw from the riser card, and remove the additional slot cover.

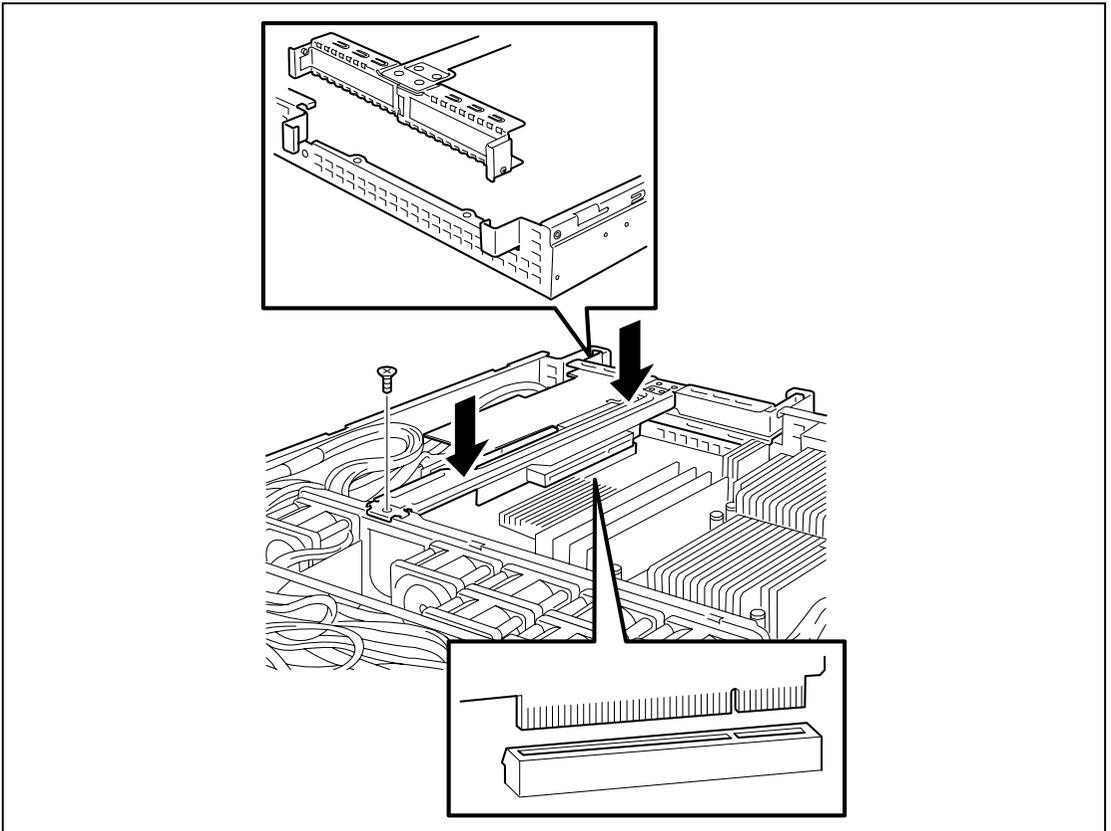


7. Install the RAID Controller on the riser card.

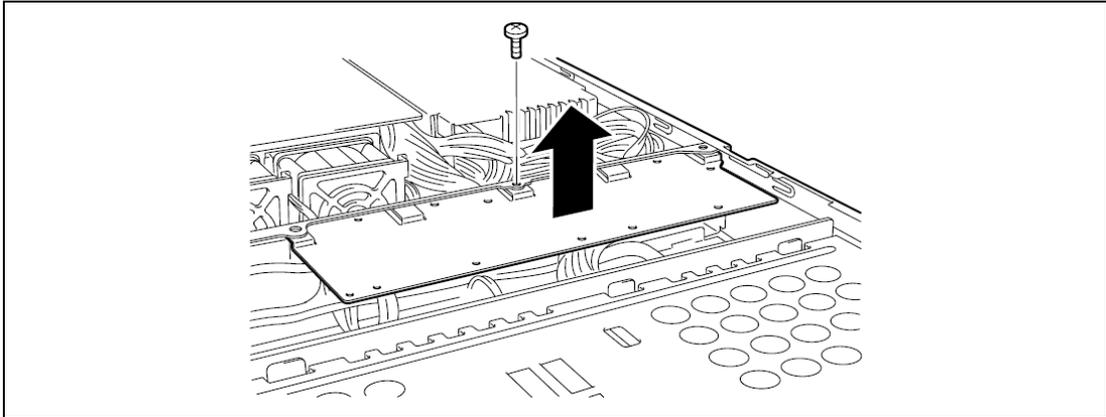


8. Insert the riser card assembly into the slot on the mother board.
Secure the riser card with a screw removed in Step 5.

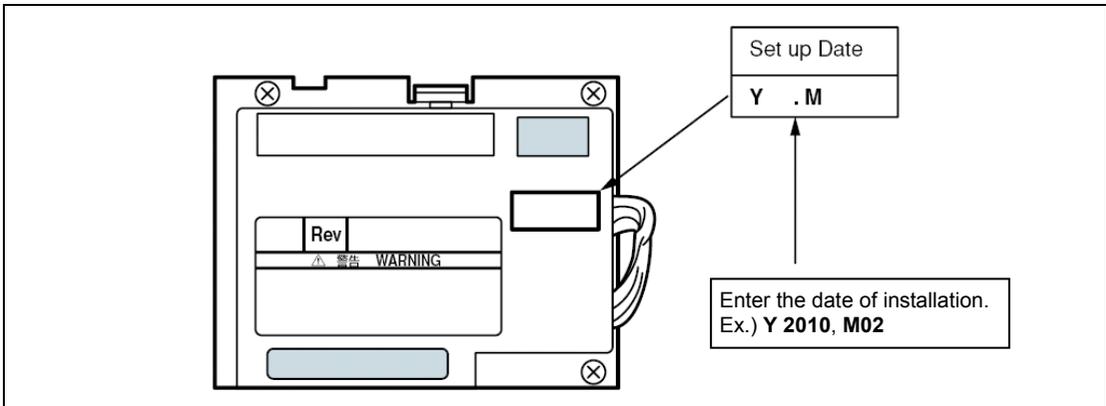
Align the riser card terminal section with the slot on the mother board, and firmly push the riser card until it is fully seated.



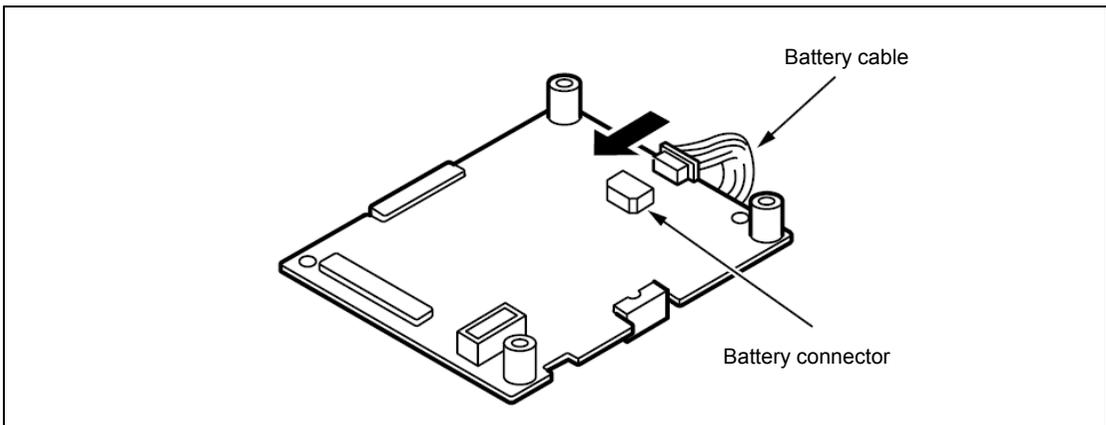
9. Remove a fixing screw, then remove the battery mounting bracket.



10. Fill in the Set Up Date label with the date (Year and Month) installed, then stick it to the location as shown in the figure below.

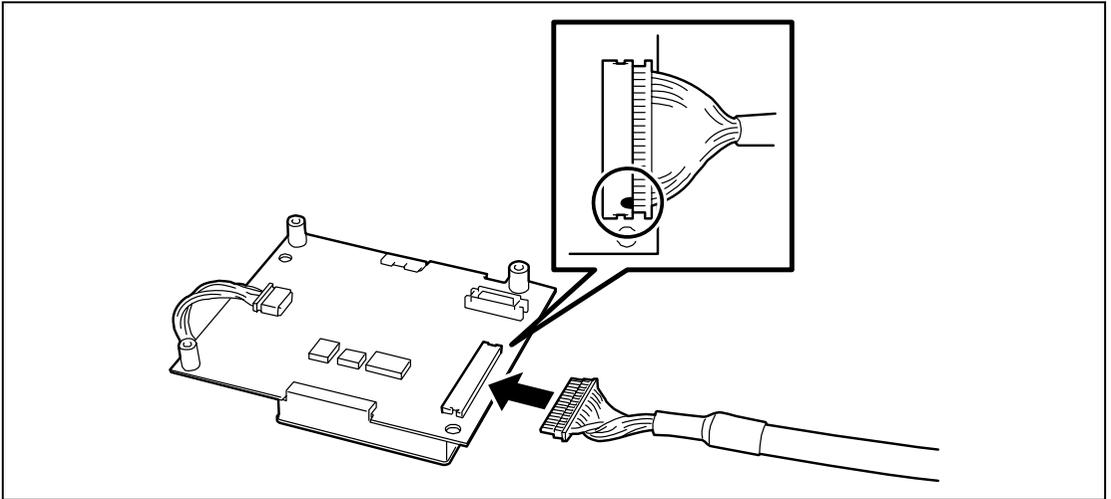


11. Connect the battery cable to the battery connector.

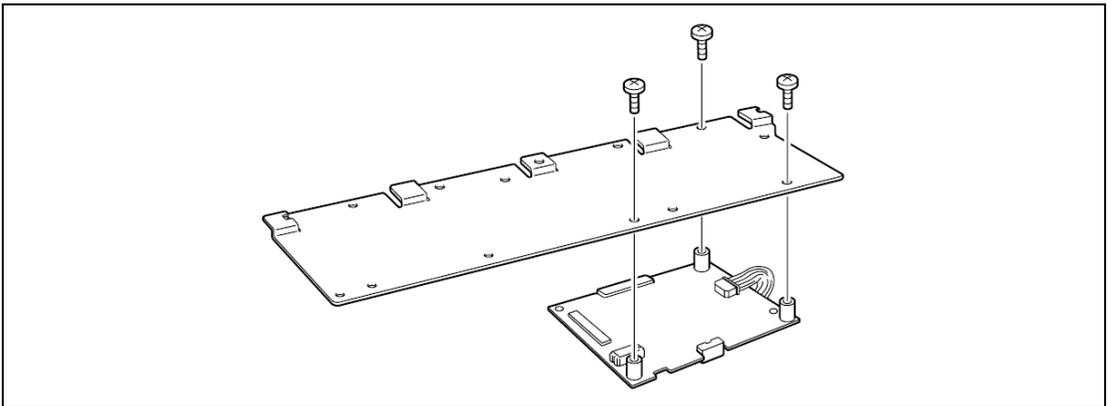


- 12.** Connect the cable to additional battery.

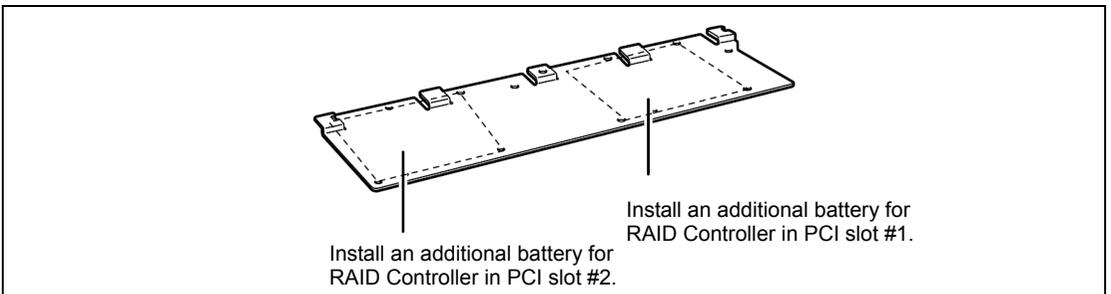
Make sure the markings on connector and that on the cable.



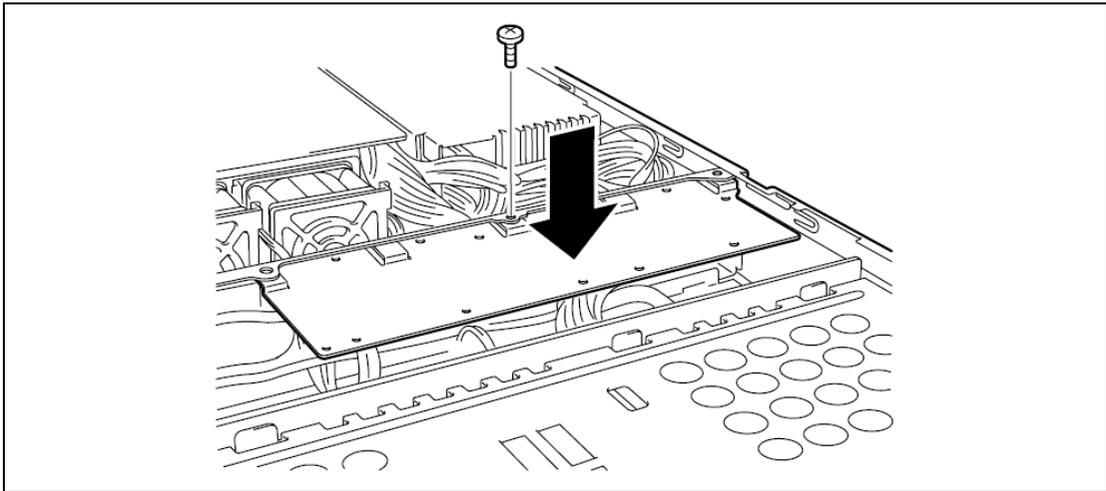
- 13.** Install the additional battery to the bracket with three screws.



Install the additional battery in the place as shown in the figure below.



14. Install the battery mounting bracket that has been removed in Step 9. Secure the battery to the bracket with a screw.

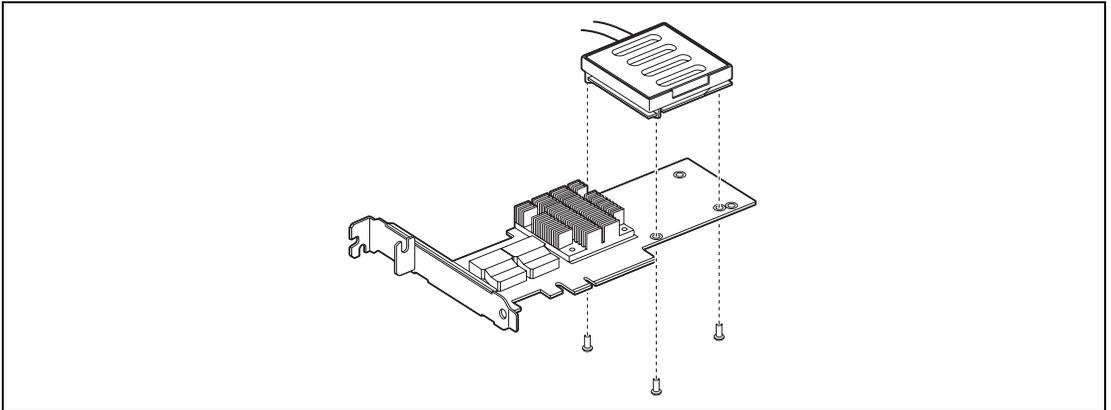


Removal

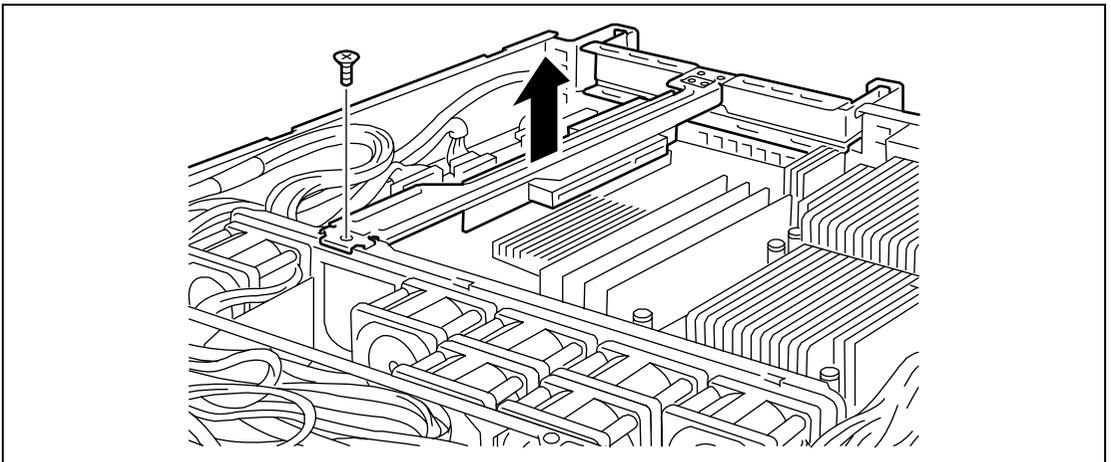
The additional battery can be removed in the reverse order of the installation.

For N8103-140 (a battery for the N8103-134/135 RAID Controller)**Installation**

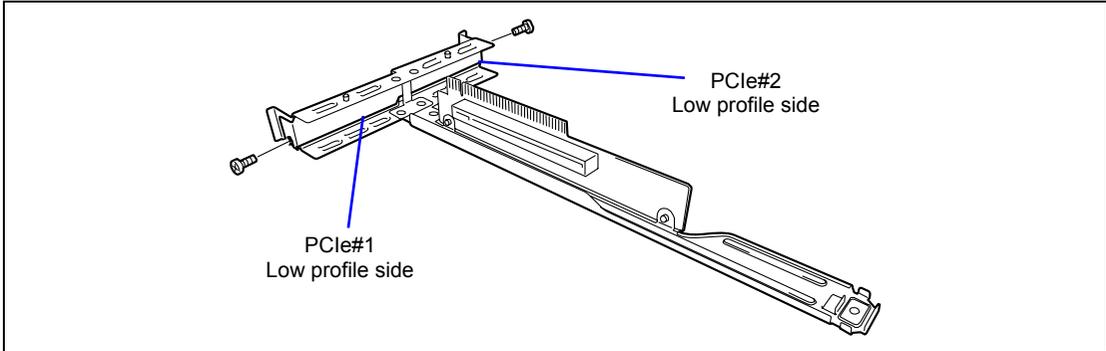
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Remove the duct cover.
3. Install the battery connection board that comes with additional battery to the RAID Controller.



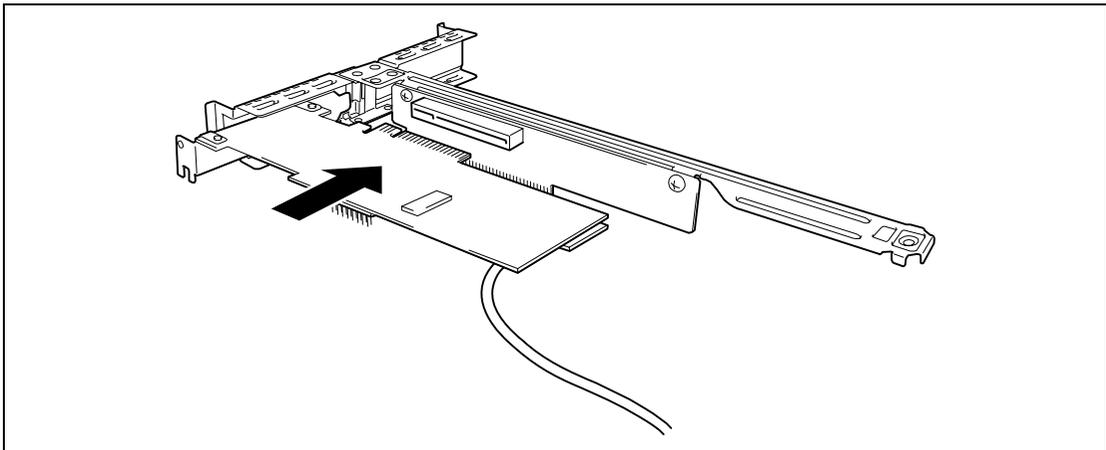
4. Remove a fixing screw from the riser card. Hold both ends of the riser card assembly and lift straight up and remove the riser card from the server.



- 5.** Remove the screw from the riser card, and remove the additional slot cover.

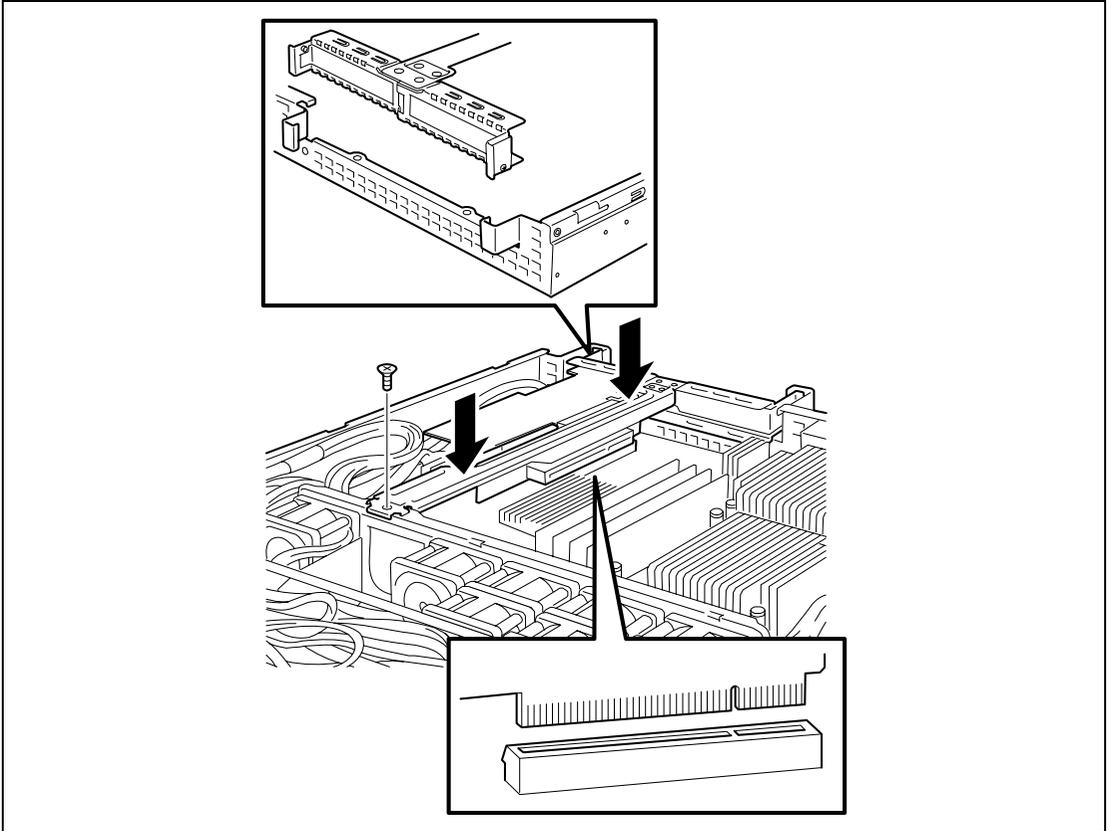


- 6.** Install the RAID Controller on the riser card.

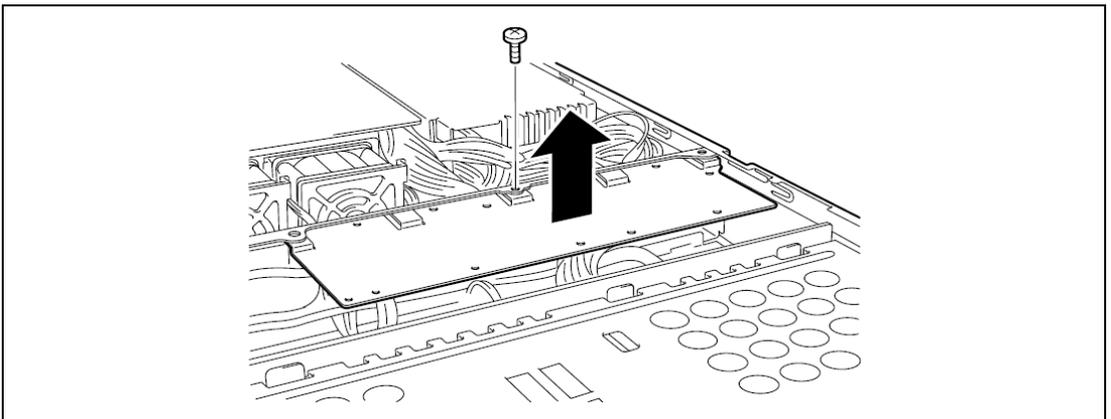


7. Insert the riser card assembly into the slot on the mother board.
Secure the riser card with a screw removed in Step 5.

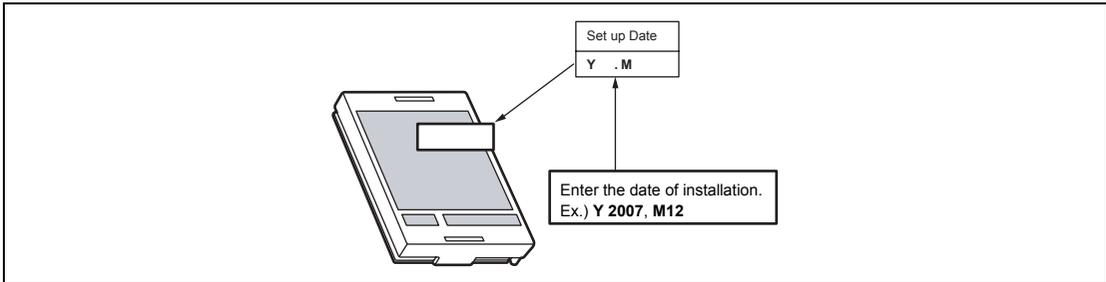
Align the riser card terminal section with the slot on the mother board, and firmly push the riser card until it is fully seated.



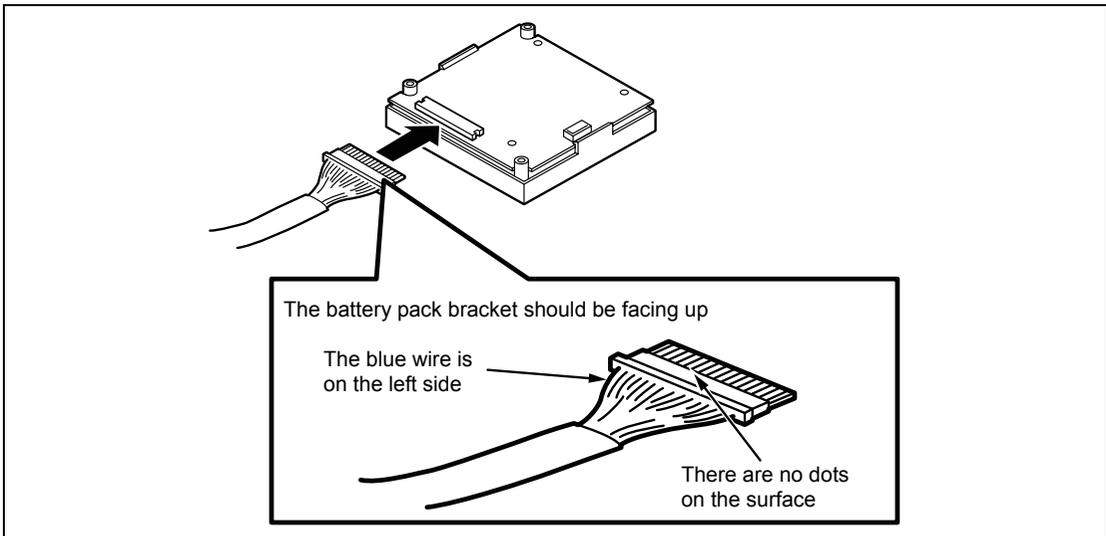
8. Remove a fixing screw, then remove the battery mounting bracket.



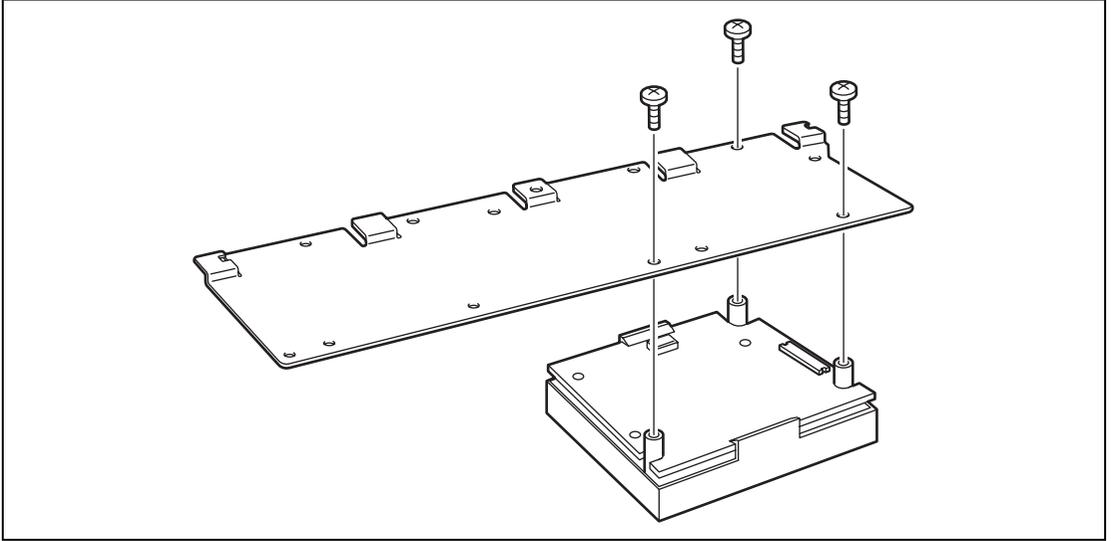
9. Fill in the Set Up Date label with the date (Year and Month) installed, then stick it to the location as shown in the figure below.



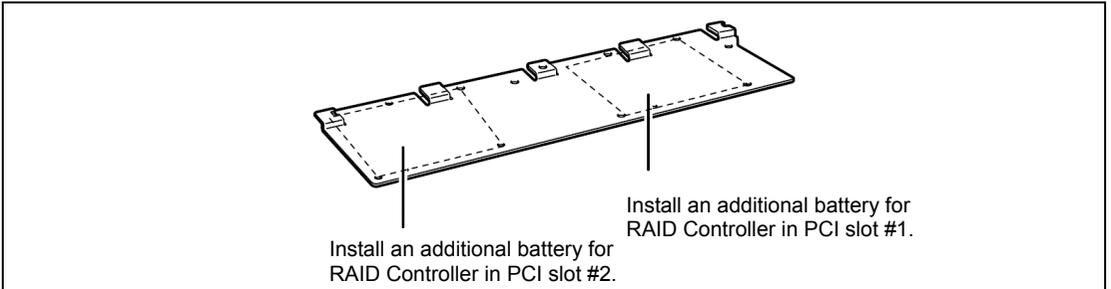
10. Connect the battery control cable to the battery pack referring to the figure below. Make sure that the connector is facing in the right direction and is inserted straight into the battery pack bracket. The correct direction of the connector is indicated in the figure below.



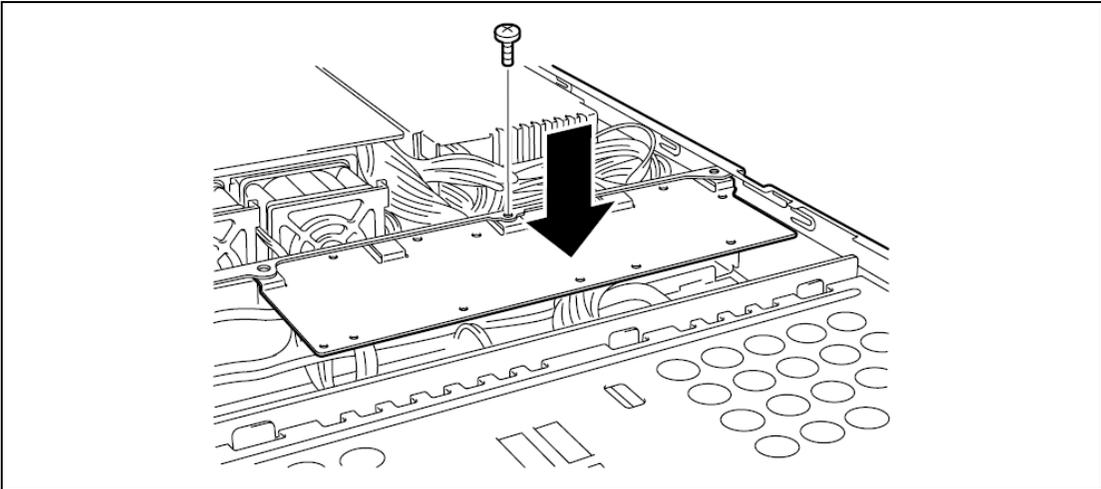
11. Install the additional battery to the bracket with three screws.



Install the additional battery in the place as shown in the figure below.



12. Install the battery mounting bracket that has been removed in Step 8. Secure the battery to the bracket with a screw.



Removal

The additional battery can be removed in the reverse order of the installation.

Use of Internal Hard Disk Drives in the RAID System

This section describes how to use hard disk drives installed in the drive bays in the RAID System.

IMPORTANT:

- Making hard disk drives in the RAID System or changing the RAID level initializes hard disk drives. If the hard disk drive to be configured in the RAID System has your valuable data stored, make sure to make a backup copy of the data in another hard disk drive before installing the RAID Controller and configuring the RAID System.
 - More than one hard disk drive is required to configure a Logical Drive.
 - Use hard disk drives of the same capacity and performance (e.g., revolution) for each pack to configure them in the RAID System.
-

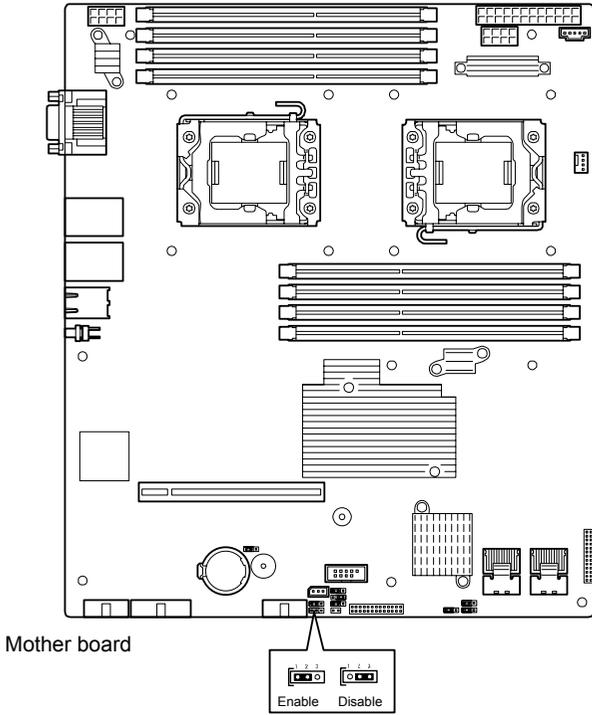
NOTES:

- Make sure of RAID levels and hard disk drives available for the RAID Controller to choose an appropriate controller.
 - A Logical Drive except for RAID0 increases disk reliability. However, the actually available capacity becomes smaller than the total hard disk drive capacity in the Logical Drive.
-

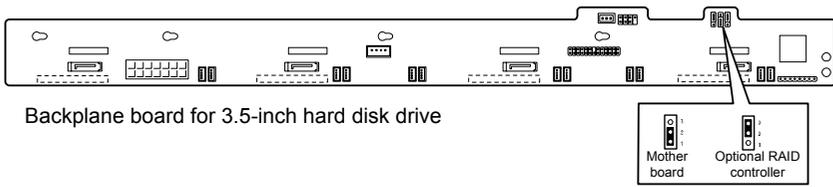
You can build a RAID System by using the Onboard RAID Controller (LSI Embedded MegaRAID™) or Optional RAID Controller (N8103-129/130/134).

To use this RAID System, you need to change jumper switch settings on mother board and backplane board.

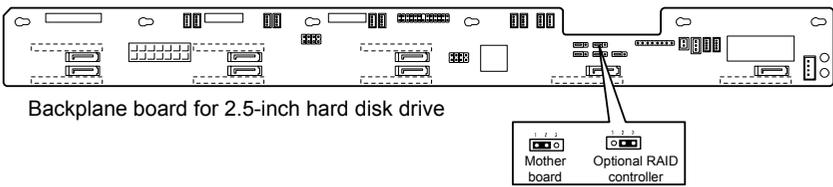
See the figure below for locations of jumper switches on Onboard RAID Controller (LSI Embedded MegaRAID™) and Optional RAID Controller (N8103-129/130/134), which are used to enable/disable the RAID Controller.



SW-RAID configuration jumper switch (SATA_RAID)



Controller configuration jumper switch (J3)



Controller configuration jumper switch (J3)

* The illustration shows the backplane board viewed from the rear side.

Onboard RAID Controller (LSI Embedded MegaRAID™)

RAID Controller is factory embedded in your mother board. Setting RAID configuration jumper switch allows internal hard disk drives to be recognized as RAID drives. Set the jumper switch as shown below.

Setting of Jumper Switches on Mother Board and Backplane Board

Set the jumper pin as shown below.

- Jumper pin on mother board (SATA_RAID)

SW-RAID configuration jumper switch



Enable (1-2)

- Backplane board

Controller configuration jumper switch

3.5-inch hard disk drive model

2.5-inch hard disk drive model



Mother board (1-2)



Mother board (1-2)

Use LSI Software RAID Configuration Utility to configure the RAID System. See Chapter 4 for details.

Optional RAID Controller (N8103-129/130/134)

Your server can include the optional RAID Controller (N8103-129/130/134). The optional RAID Controller can control the internal hard disk drives as the RAID System. To use the hard disk drives in a RAID System, reconnect the hard disk drive interface cable on the mother board.

At the factory, the interface cable is connected to the SATA connector on the mother board. Refer to the manual coming with optional RAID Controller (N8103-129/130/134) for details.

IMPORTANT: The RAID Controller board is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the RAID Controller. Do not touch the RAID Controller terminals or on-board parts by a bare hand or place the RAID Controller directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.

NOTE: Before installing an optional RAID Controller, run the SETUP utility, select [Advanced] → [PCI Configuration], and confirm that [Enabled] is set for the parameter [PCI Slot xx ROM] (xx: PCI slot number).

Installation

See "PCI Board" in this chapter and manual that comes with the optional RAID Controller for the installation of the RAID Controller (N8103-129/130/134).

IMPORTANT: When the RAID Controller is connected, the boot priority specified in BIOS SETUP utility must be eighth or younger. If specified ninth or later, the configuration menu of RAID Controller will fail to start.

Setting of Jumper Switches on Mother Board and Backplane Board

To use the optional RAID Controller (N8103-129/130/134), you need to change jumper switch setting on the mother board and the backplane board.

See "Use of Internal Hard Disk Drives In the Raid System" for jumper pin locations.

- Jumper pin on mother board (SATA_RAID)

SW-RAID configuration jumper switch



Disable (2-3)

- Backplane board

Controller configuration jumper switch

3.5-inch hard disk drive model 2.5-inch hard disk drive model



Optional RAID Controller (2-3)



Optional RAID Controller (2-3)

Removal

Remove the optional RAID Controller in reverse order of the installation steps.

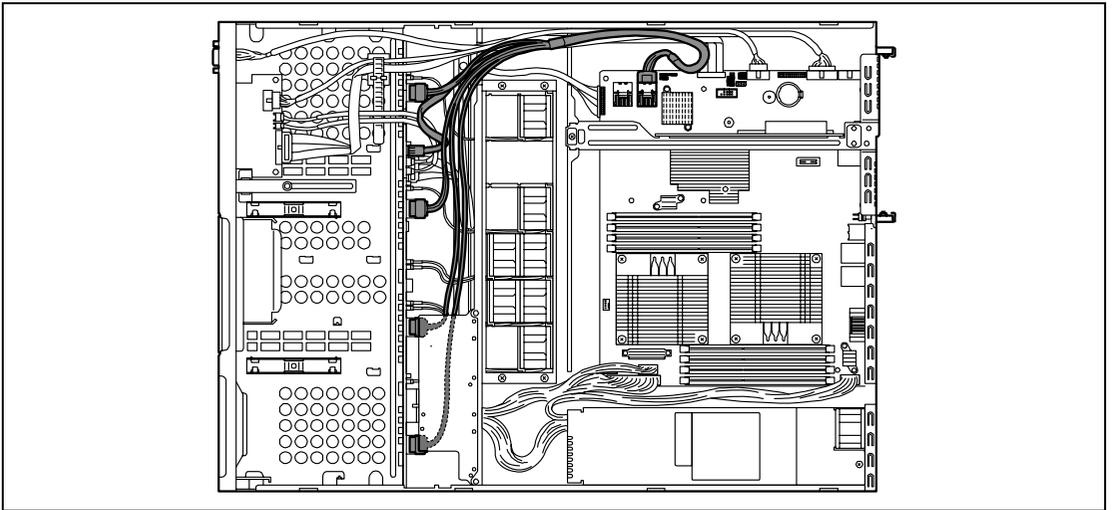
If you use the server with the optional RAID Controller being removed, be sure to install the additional slot cover that has been removed from the riser card. Secure the additional slot cover with the screw.

Cable Routing

If the optional RAID controller is installed, the interface cable needs to be routed. See the figures below for how to route the cable.

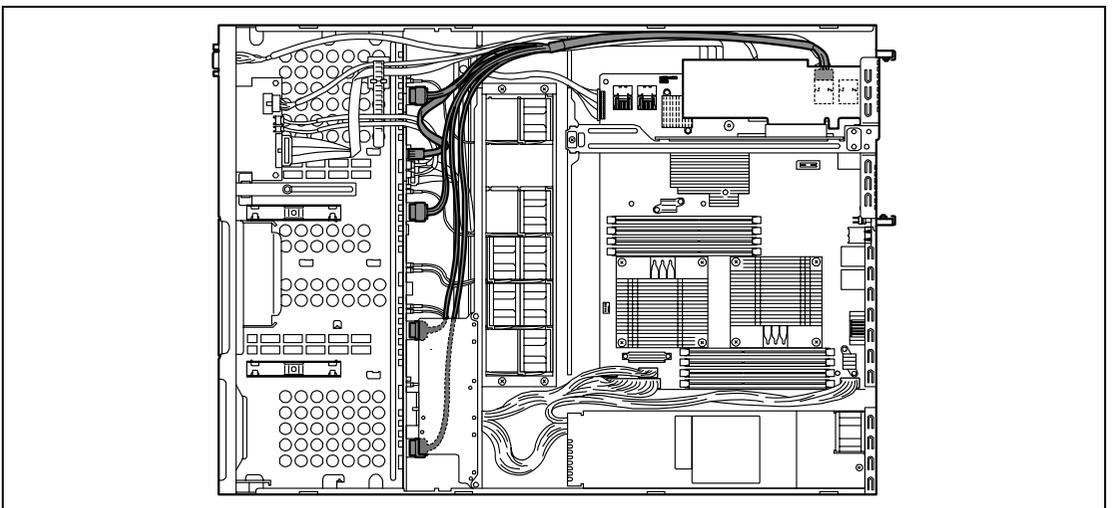
< 3.5-inch hard disk drive model with Onboard RAID Controller > (Factory-installed)

In standard configuration, the cable is connected with the SATA connector on mother board. You need not to change cable connection.



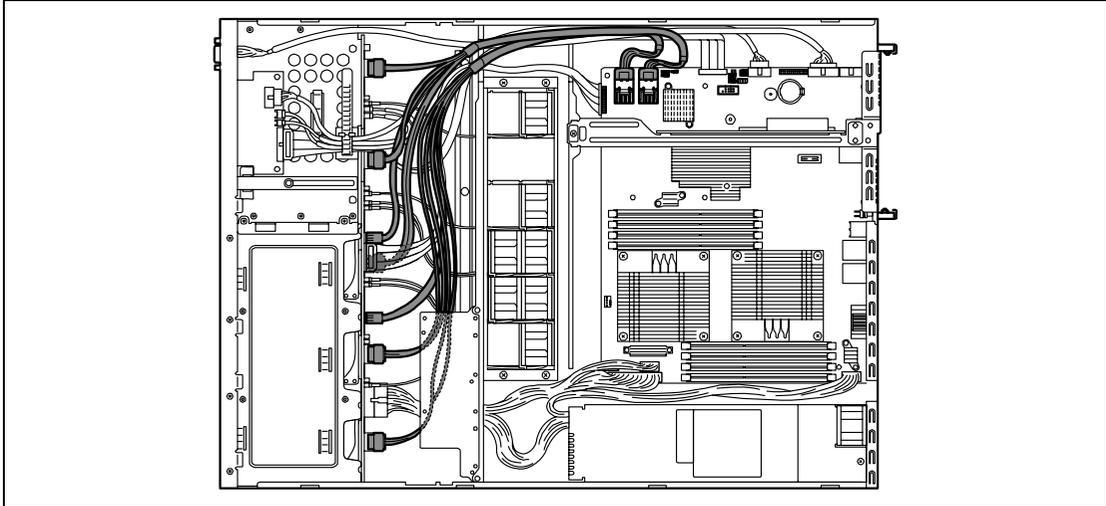
< 3.5-inch hard disk drive model with Optional RAID Controller installed >

Disconnect the SAS/SATA cable from the SATA connector on mother board, then connect it with the connector on Optional RAID Controller.



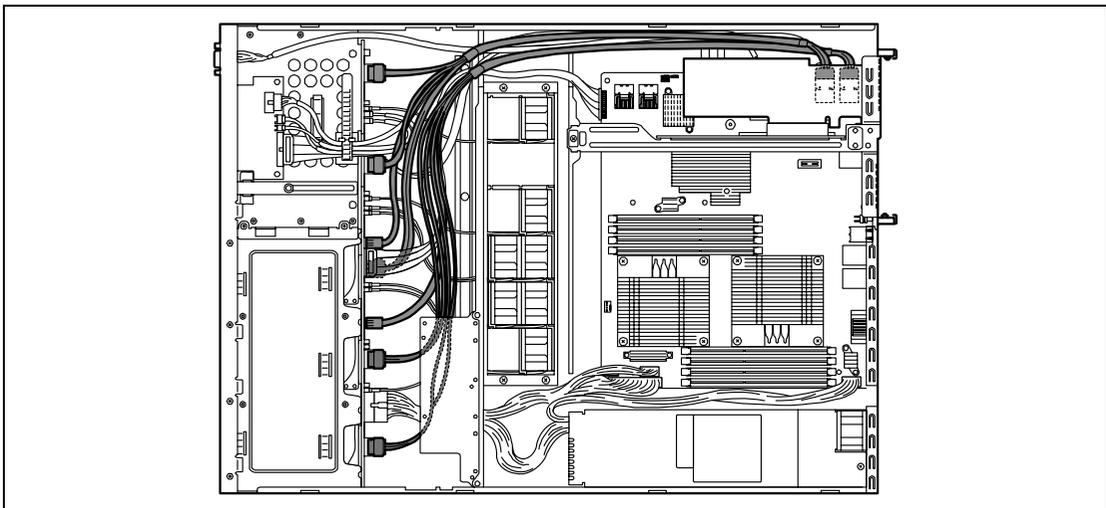
< 2.5-inch hard disk drive model with Onboard RAID Controller installed >

In standard configuration, the cable is connected with the SATA connector on mother board. You need not to change cable connection.



< 2.5-inch hard disk drive model with Optional RAID Controller installed >

Disconnect the SAS/SATA cable from the SATA connector on mother board, then connect it with the connector on Optional RAID Controller.



IMPORTANT: In standard configuration of 2.5-inch hard disk drive model, two SAS/SATA cables are connected. Be sure to connect both SAS/SATA cables to the connectors on optional RAID Controller. You cannot use the onboard RAID Controller and Optional RAID Controller simultaneously.

Notice

Observe the following notes on configuring a RAID System:

- The installed hard disk drives (SAS drives or SATA drives) must be the same capacity and the same rotational speed. (The minimum number of required disks depends on the configuration of RAID.)
- Select/set a RAID level "RAID0" or "RAID1".

When installing a system in an internal hard disk drive, you should use "Express Setup" to perform all the procedures for RAID System configuration, OS installation, and then OS setup.

Use Express Setup even when not installing a system. Start Express Setup, select [OS Selection] → [Others]. The installer automatically performs all the procedures for RAID System configuration, and then maintenance utility installation.

When making the setup in manual mode, use the RAID System configuration utility in the chip on the board. You can start the utility during execution of POST that automatically starts immediately after you turn on the server power switch. For details, see the document in the NEC EXPRESSBUILDER DVD provided with the server. (The utility varies depending on the RAID Controller.) For details on the data transfer rate, RAID, and RAID System configuration, see the manual provided with the RAID Controller as well as the document.

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Appendix A

Specifications

N8100-1682F (2.5-inch AC PSU model) - 1/2

Model number		NEC Express5800/E120b-1
		N8100-1682F
Configuration at shipment		Memory-less, disk-less
CPU	Type	Intel® Xeon® quad-core processor
	Clock	2.13 GHz
	Standard	1
	Maximum	2
Memory	Standard	None
	Maximum	64 GB (8 GB × 8 sticks)
	Number of sticks added at a time	1
	Max. number of sticks	8
	Memory module	DDR3-1333
	Error check	ECC
Display	Graphics accelerator	Embedded Server Engines™ 2nd Gen Server Management Controller
	Video RAM	8 MB
	Graphic display	640 × 480, 800 × 600, 1,024 × 768, 1,280 × 1,024, 1,600 × 1,200 (16.77 million colors max. for all resolutions)
Auxiliary storage device	FDD (standard)	None
	HDD (standard)	None
	Maximum HDD capacity	SATA2 (500 GB × 8), SAS (600 GB × 8), SSD (50 GB × 8)
	Hot-plug HDD	Hot Plug SAS/SATA HDD, SATA SSD × 8
	Optical disk drive (standard)	None
	Optical disk drive (optional)	None
Additional slot	PCI	PCI Express (x8) × 1, PCI Express (x8) × 1 (16 sockets)
Disk array	Standard	Onboard SATA SW RAID0/1/10
	Optional	RAID Controller
Internal interface	SAS	None (optional)
	SATA	6 ports
External interface	Keyboard	–
	Mouse	–
	Serial interface	Rear: D-sub 9-pin connector (RS-232C-compliant) × 1 Internal: D-sub 9-pin connector (RS-232C-compliant) × 1 (optional)
	Network	1000BASE-T (100BASE-TX/10BASE-T-compatible) LAN connector (RJ45) × 2 ports, 100BASE-TX/10BASE-T LAN connector (RJ-45) for management × 1 port
	Display	D-sub 15-pin connector × 2 (1 each on front and rear panel)
	USB	4-pin connector (2 for front panel, 4 for rear panel), Ver. 2.0 supported
Chassis design		Rack-mounted (1U height)
External dimensions (mm)		444 (width) × 43.6 (height) × 615 (depth)

N8100-1682F (2.5-inch AC PSU model) - 2/2

Model number		NEC Express5800/E120b-1 N8100-1682F
Weight (max.)		10.5 kg (16 kg)
Power supply		100 to 120 V AC $\pm 10\%$, 200 to 240 V AC $\pm 10\%$, 50/60 Hz ± 1 Hz
Power consumption	Operating	257 VA, 253 W
	Standby	190 VA, 186 W
Environmental requirements	Temperature	10 to 35°C (operating), -10 to 55°C (non-operating, storage)
	Humidity	20 to 80% RH (no condensation)

N8100-1685F (3.5-inch AC PSU model)

Model number		NEC Express5800/E120b-1	
		N8100-1685F	
Configuration at shipment		Memory-less, disk-less	
CPU	Type	Intel® Xeon® quad-core processor	
	Clock	2.13 GHz	
	Standard	1	
	Maximum	2	
Memory	Standard	None	
	Maximum	64 GB (8 GB × 8 sticks)	
	Number of sticks added at a time	1	
	Max. number of sticks	8	
	Memory module	DDR3-1333	
	Error check	ECC	
Display	Graphics accelerator	Embedded Server Engines™ 2nd Gen Server Management Controller	
	Video RAM	8 MB	
	Graphic display	640 × 480, 800 × 600, 1,024 × 768, 1,280 × 1,024, 1,600 × 1,200 (16.77 million colors max. for all resolutions)	
Auxiliary storage device	FDD (standard)	None	
	HDD (standard)	None	
	Maximum HDD capacity	SATA2 (2 TB × 4)	
	Hot-plug HDD	Hot Plug SATA HDD × 4	
	Optical disk drive (standard)	None	
	Optical disk drive (optional)	None	
Additional slot	PCI	PCI Express (x8) × 1, PCI Express (x8) × 1 (16 sockets)	
Disk array	Standard	Onboard SATA SW RAID0/1/10	
	Optional	RAID Controller	
Internal interface	SAS	None (optional)	
	SATA	6 ports	
External interface	Keyboard	-	
	Mouse	-	
	Serial interface	Rear: D-sub 9-pin connector (RS-232C-compliant) × 1 Internal: D-sub 9-pin connector (RS-232C-compliant) × 1 (optional)	
	Network	100BASE-T (100BASE-TX/10BASE-T-compatible) LAN connector (RJ45) × 2 ports, 100BASE-TX/10BASE-T LAN connector (RJ-45) for management × 1 port	
	Display	D-sub 15-pin connector × 2 (1 each on front and rear panel)	
	USB	4-pin connector (2 for front panel, 4 for rear panel), Ver. 2.0 supported	
Chassis design		Rack-mounted (1U height)	
External dimensions (mm)		444 (width) × 43.6 (height) × 615 (depth)	
Weight (max.)		10.5 kg (16 kg)	
Power supply		100 to 120 V AC ±10%, 200 to 240 V AC ±10%, 50/60 Hz ±1 Hz	
Power consumption	Operating	267 VA, 258 W	
	Standby	183 VA, 172 W	
Environmental requirements	Temperature	10 to 35°C (operating), -10 to 55°C (non-operating, storage)	
	Humidity	20 to 80% RH (no condensation)	

N8100-1627F/1689F (2.5-inch EcoPowerGateway DC PSU model)

Model number		NEC Express5800/E120b-1	
		N8100-1627F	N8100-1689F
Configuration at shipment		Memory-less, disk-less	
CPU	Type	Intel® Xeon® quad-core processor	Intel® Xeon® hexa-core processor
	Clock	2.13 GHz	2.26 GHz
	Standard	1	
	Maximum	2	
Memory	Standard	None	
	Maximum	64 GB (8 GB × 8 sticks)	
	Number of sticks added at a time	1	
	Max. number of sticks	8	
	Memory module	DDR3-1333	
	Error check	ECC	
Display	Graphics accelerator	Embedded Server Engines™ 2nd Gen Server Management Controller	
	Video RAM	8 MB	
	Graphic display	640 × 480, 800 × 600, 1,024 × 768, 1,280 × 1,024, 1,600 × 1,200 (16.77 million colors max. for all resolutions)	
Auxiliary storage device	FDD (standard)	None	
	HDD (standard)	None	
	Maximum HDD capacity	SATA2 (500 GB × 8), SAS (600 GB × 8), SSD (50 GB × 8)	
	Hot-plug HDD	Hot Plug SAS/SATA HDD, SATA SSD × 8	
	Optical disk drive (standard)	None	
	Optical disk drive (optional)	None	
Additional slot	PCI	PCI Express (x8) × 1, PCI Express (x8) × 1 (16 sockets)	
Disk array	Standard	Onboard SATA SW RAID0/1/10	
	Optional	RAID Controller	
Internal interface	SAS	None (optional)	
	SATA	6 ports	
External interface	Keyboard	–	
	Mouse	–	
	Serial interface	Rear: D-sub 9-pin connector (RS-232C-compliant) × 1 Internal: D-sub 9-pin connector (RS-232C-compliant) × 1 (optional)	
	Network	1000BASE-T (100BASE-TX/10BASE-T-compatible) LAN connector (RJ45) × 2 ports, 100BASE-TX/10BASE-T LAN connector (RJ-45) for management × 1 port	
	Display	D-sub 15-pin connector × 2 (1 each on front and rear panel)	
	USB	4-pin connector (2 for front panel, 4 for rear panel), Ver. 2.0 supported	
Chassis design		Rack-mounted (1U height)	
External dimensions (mm)		444 (width) × 43.6 (height) × 615 (depth)	
Weight (max.)		10.5 kg (16 kg)	
Power supply		DC 12 V ±5%	
Power consumption	Operating	244 W	295 W
	Standby	187 W	187 W
Environmental requirements	Temperature	10 to 35°C (operating), –10 to 55°C (non-operating, storage)	
	Humidity	20 to 80% RH (no condensation)	

Appendix B

Other Precautions

Transfer Rate of the On-board LAN Controller

The mother board includes the two network interface controllers that supports 10Base-T, 100Base-TX, and 1000Base-T networks and a capable of full or half duplex.

The both controllers 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 DVD that comes with the server contains the NEC ESMPRO utility.

NEC recommends that you should install the NEC ESMPRO for effective use of the reliability enhancement features of the server.

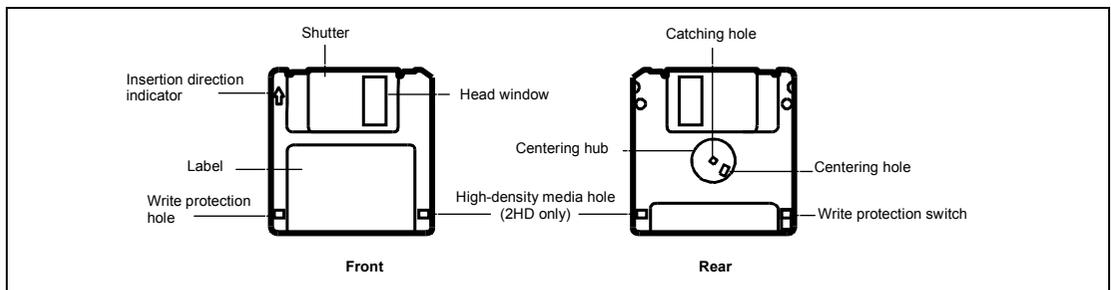
Floppy Disk

The following describes use of the floppy disk.

Floppy disk type

The server uses 3.5-inch floppy disks. You can use the following two types of 3.5-inch floppy disks:

- 2HD floppy disk (double-sided high-density track type)
Stores data of 1.44MB.
- 2DD floppy disk (double-sided double-density track type)
Stores data of 720KB.



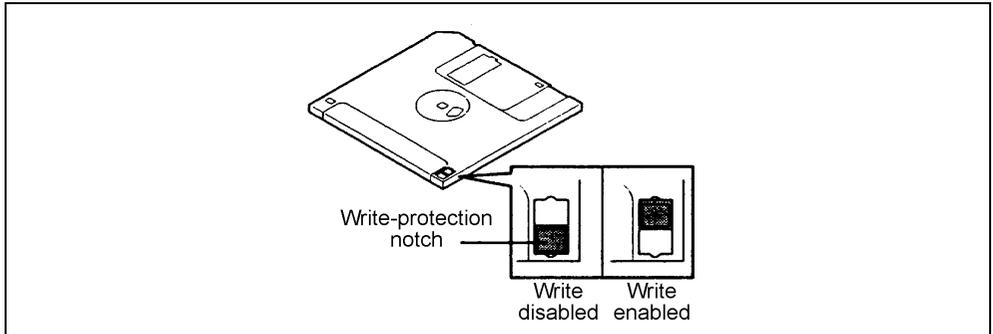
Notes on use

The floppy disk is an important data storage media with delicate structure and requires care. Keep the following notes in mind to use it:

- Insert the floppy disk into the floppy disk drive gently as far as it goes.
- Attach the label to the correct position.
- Do not write anything directly onto the disk surface with a pencil or ball-point pen.
- Do not open the shutter.
- Do not use the floppy disk in a dusty place.
- Do not place anything on the floppy disk.
- Do not leave the floppy disk in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).
- Do not leave the floppy disk with foods and drinks, or in a place exposed to cigarette smoke.
- Do not leave the floppy disk near any form of liquid or a chemical or in a place where a chemical may be accidentally sprayed over them.
- Do not place any magnetic objects (e.g., magnet) near the floppy disk.
- Do not clip the floppy disk or drop it.
- Keep the floppy disk in a floppy disk case that protects it from magnetism and dust.

- Write-protection

A floppy disk has a write-protect switch that prevents the stored data from accidental erasure.



You can read data from a write-protected floppy disk, but you cannot save data into the floppy disk or format it. NEC recommends that you should write-protect any floppy disk containing valuable data unless you are about to save data.

To write-protect a 3.5-inch floppy disk, use the write-protect switch provided on its back.

- Disk format

To write data into a floppy disk, the floppy disk must be "formatted." "Formatting" is to initialize the floppy disk and make it available for the system environment (operating system).

IMPORTANT:

- Formatting a used floppy disk clears all the data contained in it, if any.
- Formatting a floppy disk from the DOS command line is not available with the server. Use a formatted floppy disk to work with it on the DOS command line.

The format method depends on your operating system. Refer to the manual that comes with your operating system for details.

- Data backup

"Data backup" is to copy data stored in a media into another media (e.g., floppy disk, digital audio tape, or magnet-optical disk).

IMPORTANT: Make sure to make a back-up copy of every floppy disk, if provided.

The floppy disk is a very delicate storage media. Dust or thermal changes, as well as operator's misconduct or server 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/DVD Discs

Keep the following notes in mind to use the disc for the server:

- Press the center of the storage case to remove the disc from the case.
- Do not drop the disc.
- Do not place anything on the disc or bend the disc.
- Do not attach any label onto the disc.
- Do not touch the signal side (nothing is printed on this side) with your hand.
- Place the disc with its printed side upward and gently put it on the tray.
- Do not scratch the disc or write anything directly on it with a pencil or ball-point pen.
- Do not leave the disc with foods and drinks, or in a place exposed to cigarette smoke.
- Do not leave the disc 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 disc, wipe the disc from its center to edge with a dry soft cloth slowly and gently.
- Use the disc cleaner to clean the disc. Do not use record spray/cleaner, benzene, or thinner.
- Keep the disc in a disc case when not in use.

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 fourth day, and so on. That is, you save data into cartridge tapes cyclically from tape A through C.

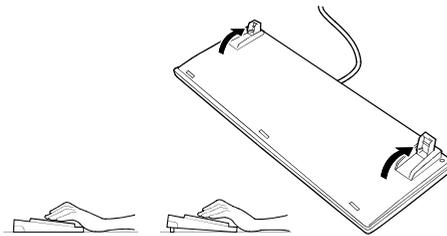
This enables you, for example, to use tape B to restore the data when tape C makes a read error. Also when both tapes B and C make a read error, you can restore your valuable data by using the data stored in tape A.

Keyboard

The keyboard is a device to instruct your computer by entering alphanumeric characters or symbols.

IMPORTANT:

- Do not pour any liquid such as water or put anything into the keyboard. Doing so may cause a failure of the keyboard.
- The keyboard provided with the server is designed for adjustment of an angle. Adjust the keyboard angle at which the keyboard is easy to operate. The adjustment assists in reducing strain on your shoulders, arms, and fingers.



NOTE: The keyboard functions depend on the software. Refer to the manual that comes with the software for details.

Mouse

Like the keyboard, the mouse is a device to instruct your computer. Many OS's and application software require the mouse for operation.

NOTE:

- Functions assigned to the mouse buttons vary depending on the software. For details, refer to the manual provided with the software.
- Use the mouse on a clean desk. Using the mouse on a dusty or dirty desk disturbs smooth movement or normal operation of the mouse. When your mouse movement seems dull, clean your mouse. (See Chapter 7.)



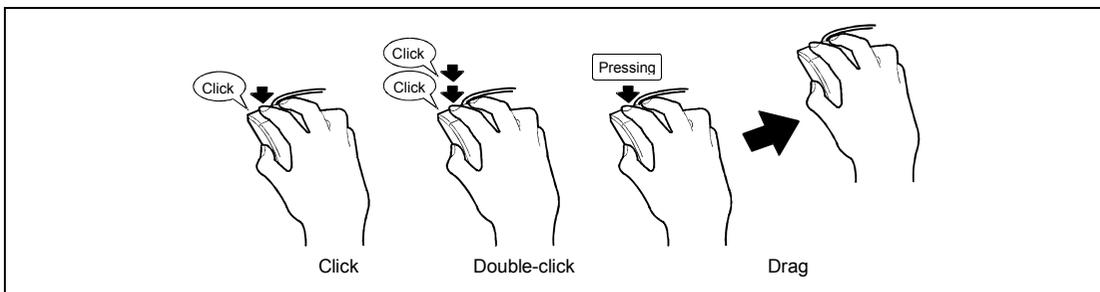
Mouse operation includes "Click," "Double-click," and "Drag."

Click: Press the button only once and release it.

Double-click: Press the button twice consecutively and release it.

Drag: Press and hold the button and move the mouse.

Operation of the server involves combinations of these mouse operations and data entries with the keyboard.



Appendix C

IRQ

The factory-set interrupt requests are listed below. Find an appropriate one to install an optional device.

IRQ	Peripheral Device (Controller)
0	System timer
1	–
2	–
3	COM2 serial port
4	COM1 serial port
5	–
6	–
7	PCI
8	Real-time clock
9	ACPI Compliant System
10	–
11	SMBUS
12	–
13	Numeric processor
14	–
15	–
16	LAN1, LAN2
17	AHCI
18	PCI, VGA
19	–
20	USB
21	USB
22	USB

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Appendix D

Installing Windows Server 2008 R2

This section explains how to install the Windows Server 2008 R2.

NOTICE

Read the following notes or information before installing the Windows Server 2008 R2.

Optional Board Supported by NEC EXPRESSBUILDER

The NEC EXPRESSBUILDER DVD attached to your server supports the following optional boards;

NOTE: If you want to install the other boards by using a driver floppy disk ("OEM-Disk for Mass storage device"), except ones listed below, see "Installing with the OEM-Disk for Mass storage device".

- Controllers supporting installation of OS with Express Setup
 - N8103-129 RAID Controller (256 MB, RAID0/1)*
 - N8103-130 RAID Controller (256 MB, RAID0/1/5/6)*
 - N8103-134 RAID Controller (512 MB, RAID0/1/5/6)*
 - Onboard RAID Controller (LSI Embedded MegaRAID™)
 - Other controllers
 - N8103-104A SAS Controller*
 - N8103-107 SCSI Controller*
 - N8103-135 RAID Controller (512 MB, RAID0/1/5/6)*
 - N8190-127 Fibre Channel Controller*
 - N8190-131 Fibre Channel Controller (2ch)*
 - N8190-153 Fibre Channel Controller (1ch)*
 - N8190-154 Fibre Channel Controller (2ch)*
- * Option.

Service Pack Which NEC EXPRESSBUILDER Supports

The NEC EXPRESSBUILDER DVD attached to the server supports following combination of the

OS installation media and Service Pack.

- Windows Server 2008 R2
 - OS installation media (No Service Pack)

Installing Service Pack

You can install the Service Pack on the server. When the Service Pack is not attached to your system, prepare it by yourself.

Connecting Hard Disk Drive

If you create multiple logical drives in your system, see "Re-installing the Operation System if Multiple Logical Drives Exist" (5-96).

Updating System

If you modified the Windows system, execute "Update the system" in the Autorun Menu.

Installing on the Mirrored Volume

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

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

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

About Removable Media

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

Floppy Disk Drive

The internal floppy disk drive is not included in your system at the standard configuration. Prepare the optional USB floppy disk drive or Flash FDD if necessary.

About the System Partition Size

The system partition size can be calculated from the following formula.

When the system is Windows Server 2008 R2:

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

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

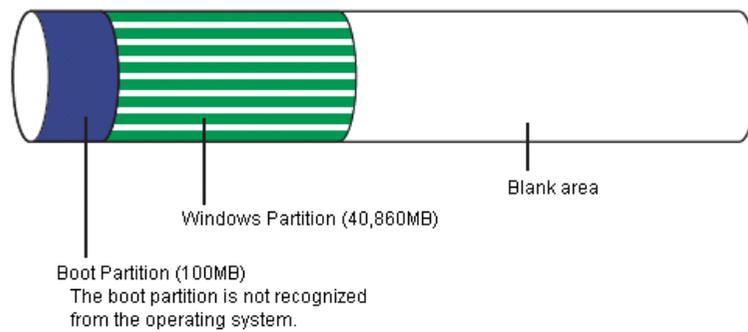
IMPORTANT:

- The above-mentioned partition size is the minimum partition size required for system installation. Ensure sufficient partition size for system operation.
Following numbers are the recommended size.
 - Full Installation: 32,768MB (32GB) or more
 - Server Core Installation: 10,240MB (10GB) or more*1GB = 1,024MB
 - The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the Windows Partition is required.
Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
 - Regardless of the size of the mounted memory, or the Write debugging information (type of memory dump), the maximum size of the dump file is 'The size of the mounted memory + 300MB'.
 - If you install any application program or the like, add necessary space to the partition to install these programs.
-

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

Example:

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



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

$$8,000\text{MB} + (1,024\text{MB} * 1.5) + (1,024\text{MB} + 300\text{MB}) + \text{application size} = 10,860\text{MB} + \text{application size}.$$

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

1. Set the system partition size to a size sufficient to install the OS and paging file.
2. See "Setting for Solving Problems" to write the debug information of the dump file onto another disk.

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

BitLocker

If you use BitLocker, note the following:

- Be sure to keep the recovery password secure. Do not keep it around a server running BitLocker.

IMPORTANT: Without the recovery password, you cannot start the operating system and see the partition content encrypted by BitLocker.

The recovery password may be needed when you start the operating system after performing the following tasks:

- Replacing the motherboard
 - Initializing the TPM
 - Changing the BIOS setting
-
- Windows Server 2008 R2 is not installed in the partition encrypted by BitLocker.
 - For BitLocker, hotfix is provided by Microsoft.
Before applying hotfix, please check the information written by Microsoft carefully.
For more information, please visit
<http://support.microsoft.com/kb/975496/en-us>

INSTALLING Windows Server 2008 R2

Preparations for Installation

- NEC EXPRESSBUILDER DVD
- Microsoft Windows Server 2008 R2 Standard (DVD-ROM) / Microsoft Windows Server 2008 R2 Enterprise (DVD-ROM)
- User's Guide
- Getting Started

Windows Server 2008 R2 Clean Installation

This section explains how to perform a clean installation of Windows Server 2008 R2.

Follow steps below appropriate to your environment.

1. Turn on your system.

IMPORTANT: To install Windows Server 2008 R2, you may need to update BIOS.

To check if your system needs a BIOS update, go to:

<http://www.nec.com/express/>

2. Insert the Windows Server 2008 R2 DVD-ROM into your DVD-ROM drive.
3. Restart the system.

To restart the system, press **Ctrl + Alt + Del** or turn off the system once, and then turn it on again.

IMPORTANT: When prompted to [press any key to boot from CD or DVD], press **Enter** while the message is displayed.

If the Windows installation screen (shown in step 4) does not appear, turn off the system, and then turn it on again.

The DVD-ROM starts. A message "Windows is loading files ..." appears.

4. Select a language and other options from the drop-down lists, and then click [Next].



5. Click the [Install now 

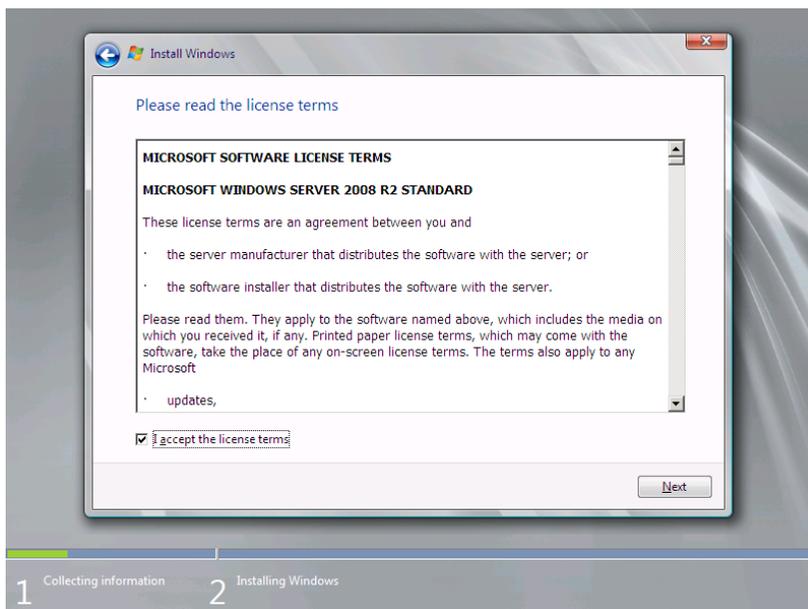
The installation starts.



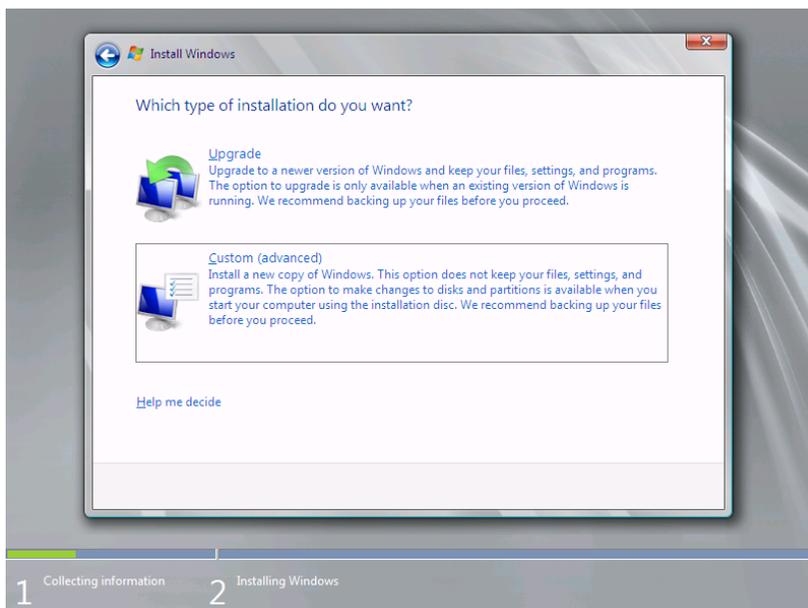
6. Select the edition of the Windows operating system that you purchased.

NOTE: The Windows versions listed on the screen vary depending on the Windows Server 2008 R2 DVD-ROM you are using.

7. Read the license terms carefully. If you agree, select [I accept the license terms], and then click [Next].



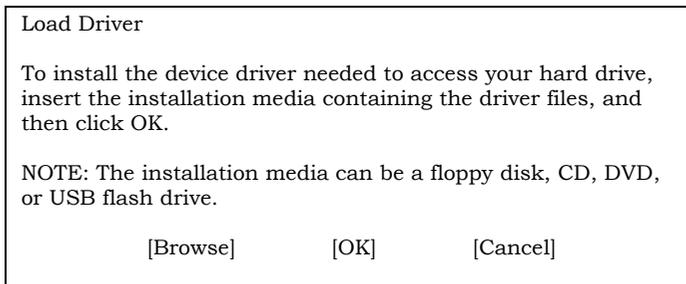
8. Select the type of installation you want. [Custom (advanced)] is selected below.



9. The screen of "Where do you want to install Windows?" is displayed.

NOTE: If the RAID Controller is not used, go to Step 12.

Remove the Backup DVD-ROM or Windows Server 2008 R2 DVD-ROM and set EXPRESSBUILDER, and select [Load Driver].



Click [Browse], and go to Step 10.

10. The folder reference dialog box appears.

Select a path in the NEC EXPRESSBUILDER DVD, and then click [OK].

- If the Onboard RAID Controller (LSI Embedded MegaRAID™) is used:
<drive letter>:\018\win\winnt\oemfd\ws2008r2\fd1\megasr1
- If the N8103-129/130 RAID Controller is used:
<drive letter>:\018\win\winnt\oemfd\ws2008r2\fd1\megasas2
- If the N8103-134 RAID Controller is used:
<drive letter>:\018\win\winnt\oemfd\ws2008r2\fd1\stexstpt

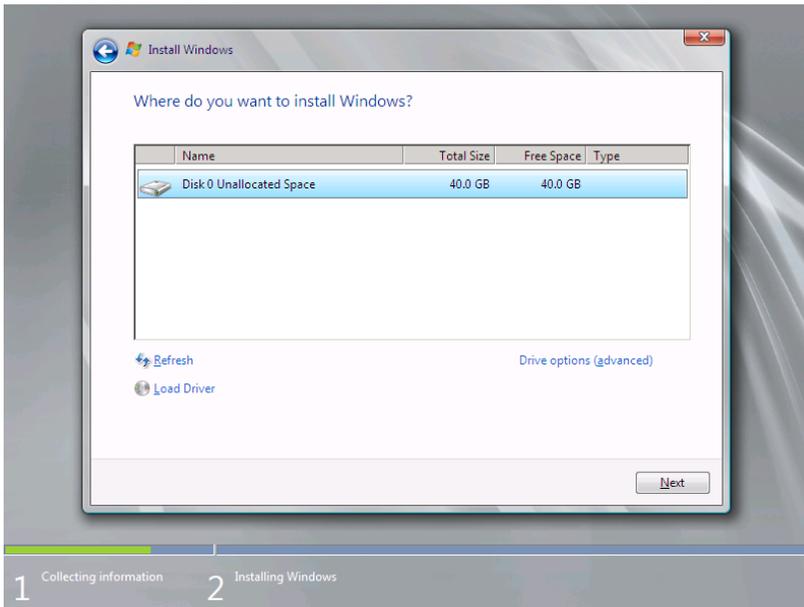
After you select the path, a list of drivers is displayed.

Select the following driver, and then click [OK]. Go to Step 11.

- If the Onboard RAID Controller (LSI Embedded MegaRAID™) is used:
[LSI Embedded MegaRAID]
- If the N8103-129/130 RAID Controller is used:
[LSI MegaRAID SAS 9264-8i]
- If the N8103-134 RAID Controller is used:
[Promise SuperTrak SAS 6G RAID Controller]

11. Remove the NEC EXPRESSBUILDER and set Backup DVD-ROM or Windows Server 2008 R2 DVD-ROM.

12. Select the disk where a partition will be created, and then click [Drive options (advanced)].



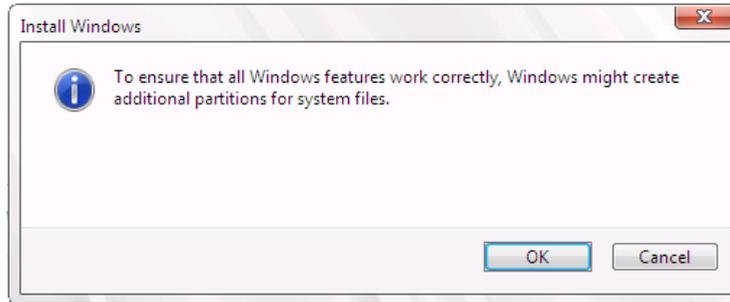
IMPORTANT: If the partition has already been created, go to step 15.

NOTE: The following message might be displayed when not replacing it with OS installation media after driver's reading. Please replace with OS installation media when it is displayed, and click "Refresh".

 [Windows cannot be installed to this disk. \(Show details\)](#)

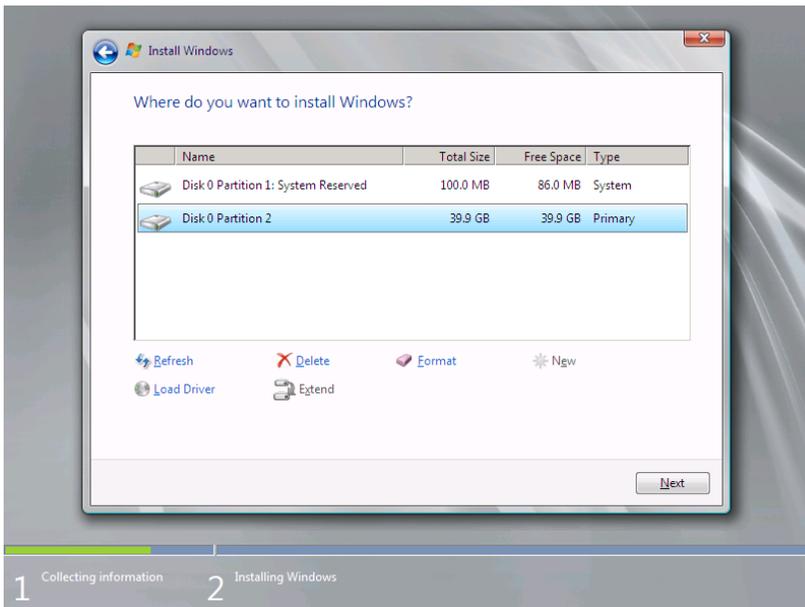
13. Click [New], enter a partition size, and then click [Apply].

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



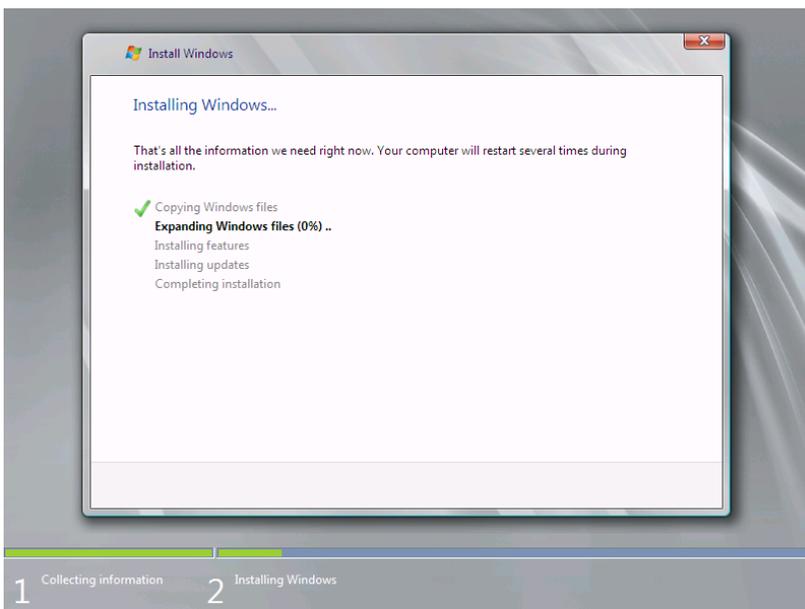
14. Select the partition created in step 13, and then click [Format].

15. Select the partition created, and then click [Next].



NOTE: The number of partitions displayed on a screen depends on your system configuration.

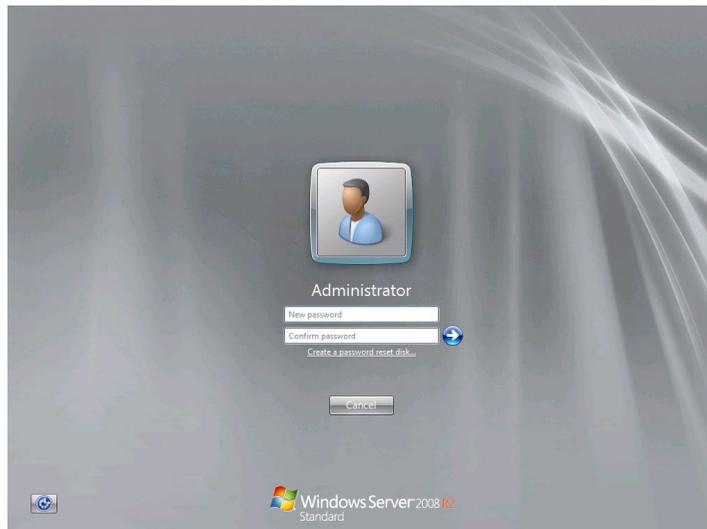
When the following message appears, the installation starts automatically.



16. After a full installation of Windows Server 2008 R2 is completed, the following dialog box will prompt you to set or change the password before you log on. Click [OK].



17. Change the password, and then click the [→] button.
- If you have selected a full installation



- If you have selected a Server Core installation



NOTE: Administrator password that satisfy the next condition, are required.

- More than 6 characters
 - Contains characters from three of the following categories (numbers, uppercase letters, lowercase letters, and signs)
-

18. When the following message appears, click [OK] to log on.

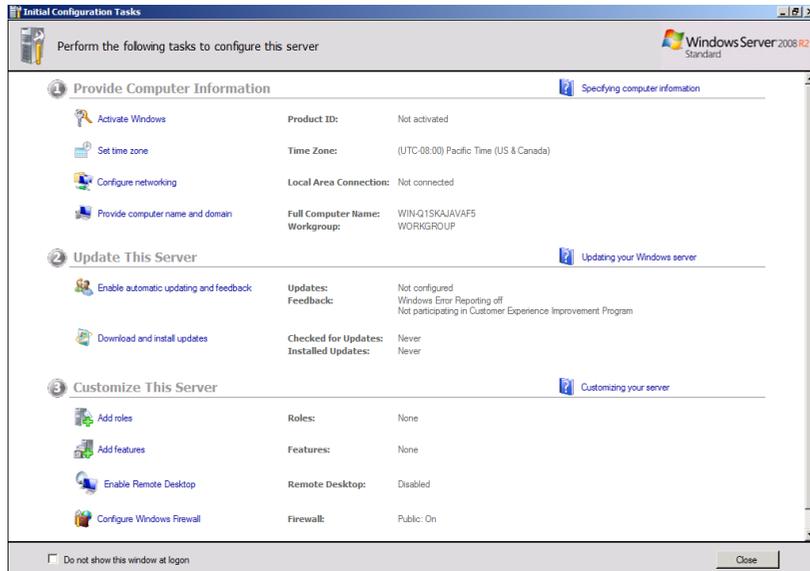


19. Log on to the system.

The steps vary depending on the edition you selected in step 9.

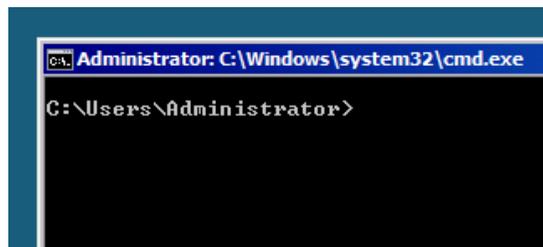
- If you have selected a full installation

On the [Initial Configuration Tasks] window, enter user information.



- If you have selected a Server Core installation

At the command prompt, enter user information.



NOTE: For more detailed procedure, see the "Microsoft Windows Server 2008 Step-By-Step Guide".

After installation is completed, be sure to execute the tasks described in "Setup of Device Driver (Normally Install in Server)" and "Updating the System" of this chapter.

Procedure for License Authentication

Product Key used in the procedure for license authentication should be matched with the COA label in which the product key contained in Windows Server 2008 R2 is written.

NOTES:

- Execute the activation within 30 days.
 - COA label may be attached to your server.
-

Updating the System

IMPORTANT:

"Updating the System" disables the Scalable Networking Pack (SNP) function.

The setting of SNP function may affect the system performance, so please refer to the attention of SNP detail in the following site before setting it.

<http://www.nec.com/global/prod/express/>

Update the system in the situation below:

- CPU is expanded (expanded to single processor to multi-processor).
- Modified system configuration.
- Recovered the system using recovery process.

The system update brings the correction program provided by Microsoft to be applied to reinforce the system security.

The system update is recommended.

Application Process of "Updating the System"

"Updating the System" applies the drivers necessary for NEC Express5800 Series.

1. Log on to the system using an administrator account.
2. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive.
3. Hereinafter, the setup process is depending on the content selected at [Installing Windows Server 2008], follow each of the instructions.
 - If you have selected a full installation

If the menu is displayed, click [Setup Windows] and click [Update the system].

NOTE: Right-clicking on the Menu produces the same outcome.

- If you have selected a Server Core installation
 - 1) Execute the following command line from command prompt to specify the optical disk drive (e.g. D drive).

```
cd /d d:\018\win\winnt\bin\oschk
```

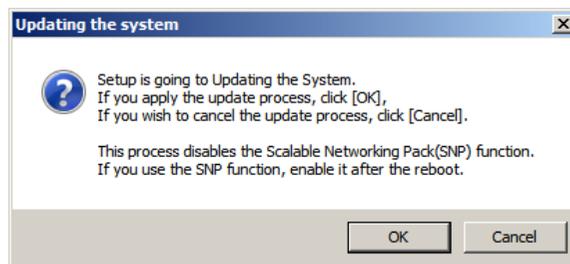
```
C:\Users\administrator>cd /d D:\018\win\winnt\bin\oschk
```

- 2) Type following command line and press **Enter**.

```
oschk.bat
```

```
D:\018\win\winnt\bin\oschk>oschk.bat
```

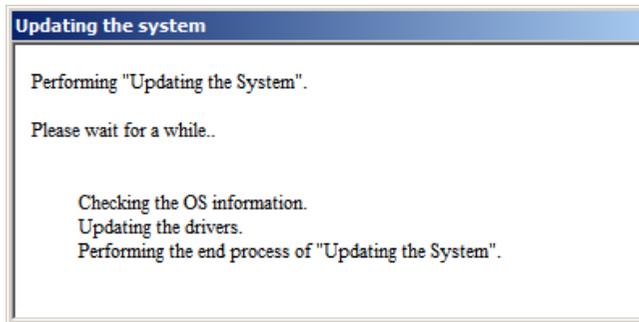
4. The following box appears.



5. Read the message, and then click [OK].

The update starts.

NOTE: The following box appears during the update if you have deployed a full installation of Windows Server 2008. Wait until the update completes.



6. When the following message appears, click [OK] to restart the system.



The system has been updated.

DRIVER INSTALLATION AND ADVANCED SETTINGS

This section describes on how to install and setup various standard drivers mounted on the device.

For the information on installing and setting up the driver that is not described in this section, please refer to the document attached to the driver.

LAN Driver and PROSet

Please refer to Chapter 5 "Installing and Setting Device Drivers" for Windows Server 2008 R2 to install and setup LAN driver and PROSet.

Graphics Accelerator Driver

If you use standard graphics accelerator drivers, update your system with NEC EXPRESSBUILDER DVD attached to your system.

Standard graphics accelerator drivers will be installed automatically.

NOTE: <Windows Server 2008>

The graphics accelerator driver is supported only on a server running a full installation. Use VGA on a server running a Server Core installation.

Please follow the following procedure when you want to reinstall the driver individually.

1. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive.
If the autorun menu is displayed, close menu screen.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "install.bat" in the following directory.
\\018\win\winnt\ws2008x64\video
4. Follow the message to continue the installation.
If the dialog message "Digital Signature could not be found." appears, select [Yes] to continue.
5. Remove the NEC EXPRESSBUILDER DVD from the optical disk drive, restart the system.

Installing SCSI Controller Driver (N8103-107)

If you use the SCSI Controller N8103-107, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing SAS Controller Driver (N8103-104A)

If you use the SAS Controller N8103-104A, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing RAID Controller Driver (N8103-135)

If you use the RAID Controller N8103-135, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing the Fibre Channel Controller Driver (N8190-127/131/153/154)

If you use the Fibre Channel Controller (N8190-127/131/153/154), you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

About Windows Activation

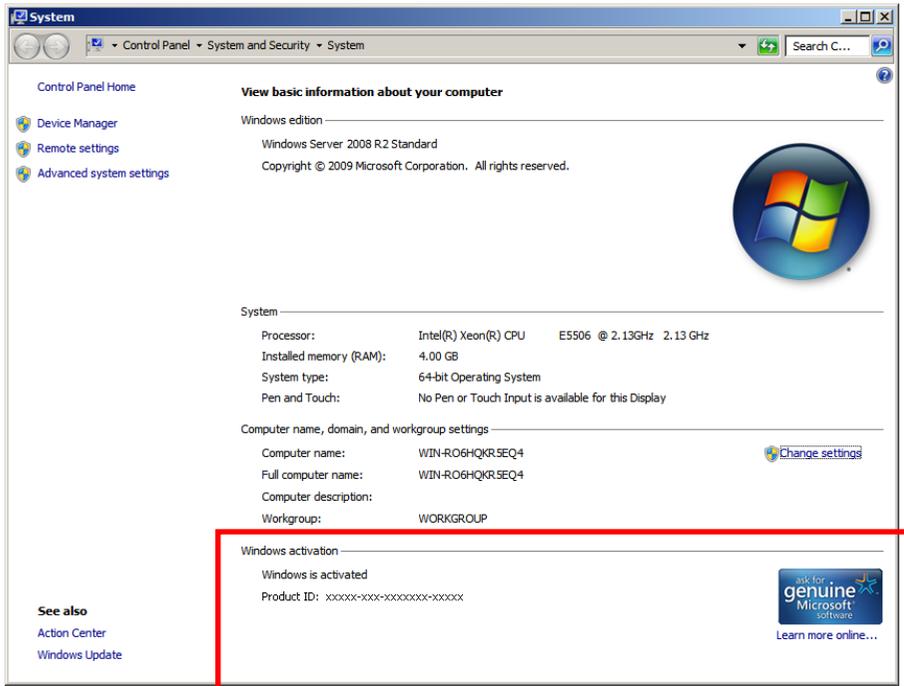
Windows Server 2008 R2 must be activated before you can use Windows Server 2008 R2.

Windows activation process is as follows.

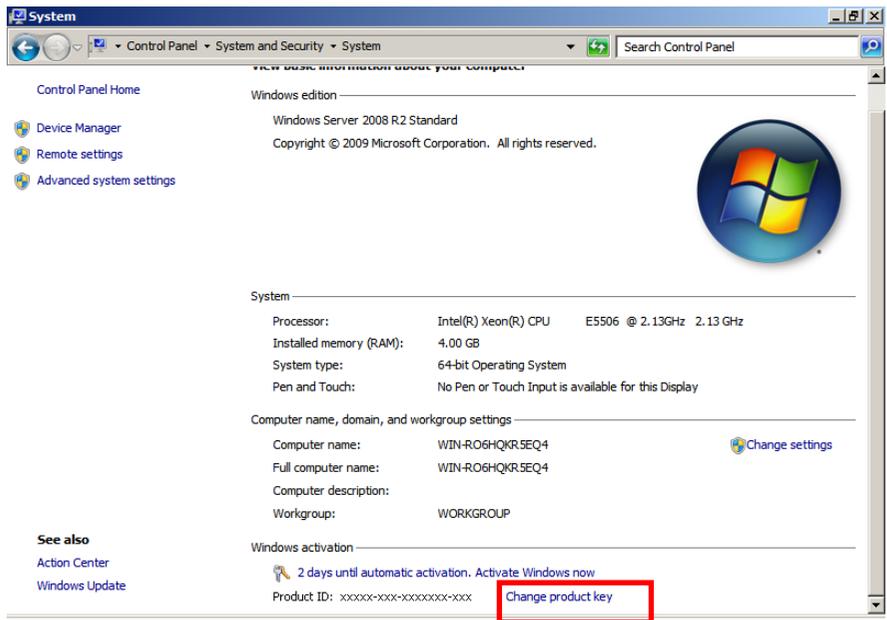
For a server running a full installation

1. Select [Control Panel] and click [System and Security], then select [System].

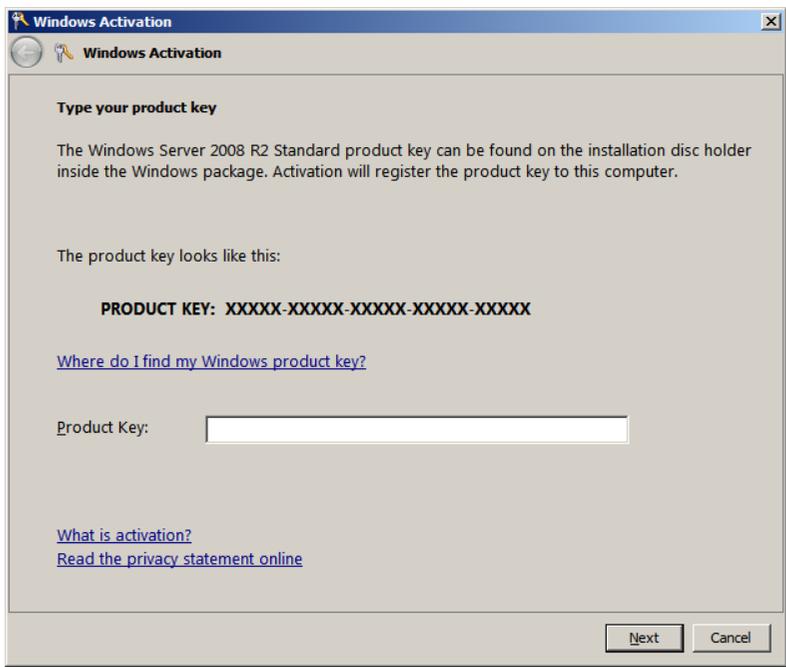
IMPORTANT: If the following message appears, Windows has already been activated on your system.



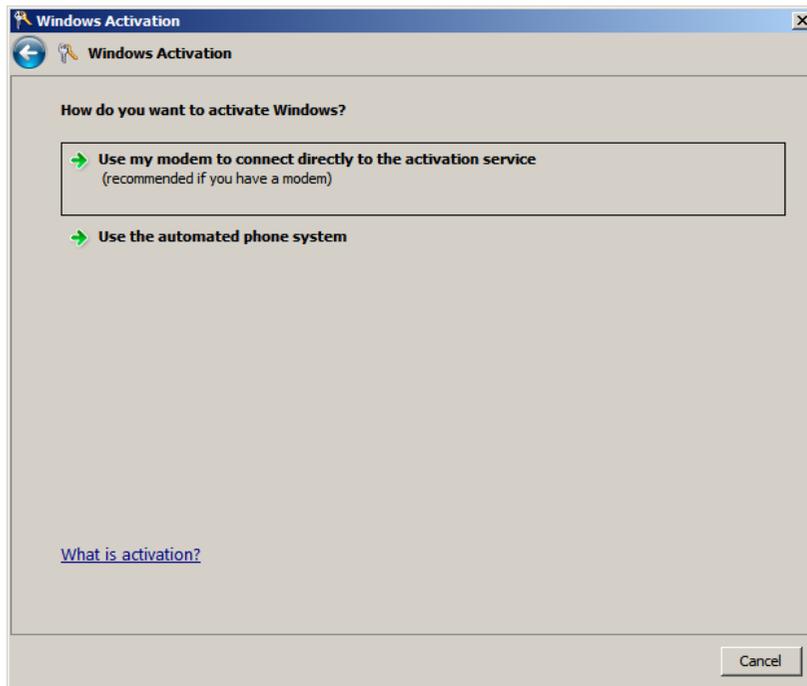
2. In the following screen, click [Change product key].



3. Type the product key shown on your COA label, and click [Next].



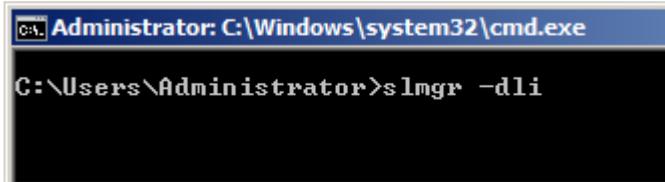
4. Activate Windows.



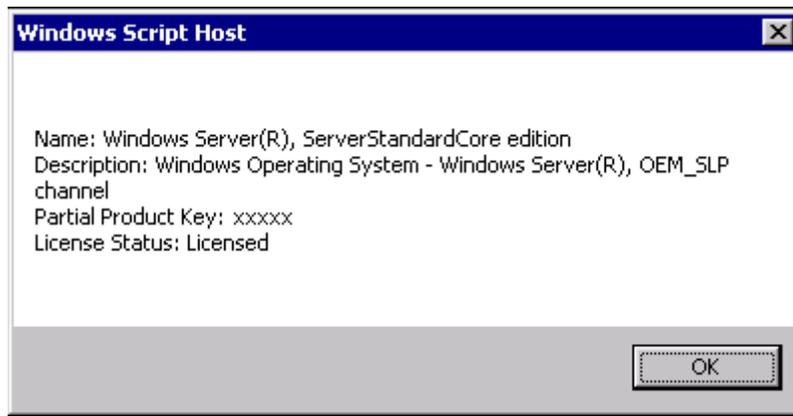
The Windows activation is complete.

For a server running a Server Core installation

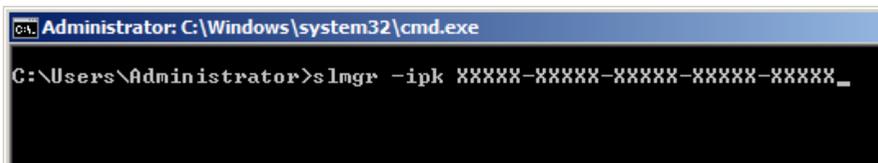
1. At the command prompt, type **slmgr -dli**, and press **Enter**.



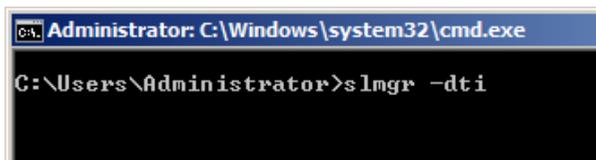
IMPORTANT: If the following message appears, Windows has already been activated on your system. Click  to exit.



2. Type **slmgr -ipk <PID>**, and press **Enter**.
* PID is your product key on the COA label.

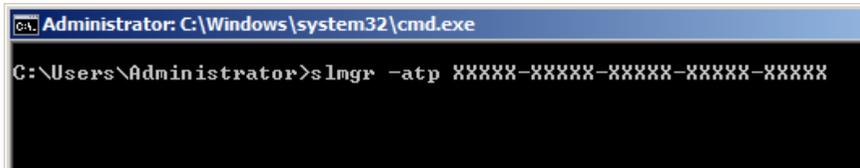


3. Type **slmgr -dti** to obtain an installation ID for Windows activation, and press **Enter**.



4. See "%systemroot%\system32\sppui\phone.inf" for the phone number of the Microsoft customer service.

5. Call the above number, inform the representative of the installation ID which you obtained in step 3, and receive a confirmation ID.
6. At the command prompt, type **slmgr -atp <CID>**, and press **Enter**.
 - * CID is the confirmation ID that you received from the call center.

A screenshot of a Windows command prompt window. The title bar reads "Administrator: C:\Windows\system32\cmd.exe". The command prompt shows the command "C:\Users\Administrator>slmgr -atp XXXXX-XXXXX-XXXXX-XXXXX-XXXXX" being entered. The background of the command prompt is black, and the text is white.

The Windows activation is complete.

SETTING FOR SOLVING PROBLEMS

Set for collecting memory dump using the procedure described in Chapter 5.

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Appendix E

Installing Windows Server 2008

This section explains how to install the Windows Server 2008.

NOTICE

Read the following notes or information before installing the Windows Server 2008.

Optional Board Supported by NEC EXPRESSBUILDER

The NEC EXPRESSBUILDER DVD attached to your server supports the following optional boards;

NOTE: If you want to install the other boards by using a driver floppy disk ("OEM-Disk for Mass storage device"), except ones listed below, see "Installing with the OEM-Disk for Mass storage device".

- Controllers supporting installation of OS with Express Setup
 - N8103-129 RAID Controller (256 MB, RAID0/1)*
 - N8103-130 RAID Controller (256 MB, RAID0/1/5/6)*
 - N8103-134 RAID Controller (512 MB, RAID0/1/5/6)*
 - Onboard RAID Controller (LSI Embedded MegaRAID™)
 - Other controllers
 - N8103-104A SAS Controller*
 - N8103-107 SCSI Controller*
 - N8103-135 RAID Controller (512 MB, RAID0/1/5/6)*
 - N8190-127 Fibre Channel Controller*
 - N8190-131 Fibre Channel Controller (2ch)*
 - N8190-153 Fibre Channel Controller (1ch)*
 - N8190-154 Fibre Channel Controller (2ch)*
- * Option.

Service Pack Which NEC EXPRESSBUILDER Supports

The NEC EXPRESSBUILDER DVD attached to the server supports following combination of the

OS installation media and Service Pack.

- Windows Server 2008
 - OS installation media (with Service Pack 2)
 - OS installation media (No Service Pack) + Service Pack 2
 - OS installation media (No Service Pack)

Installing Service Pack

You can install the Service Pack on the server. When the Service Pack is not attached to your system, prepare it by yourself.

Connecting Hard Disk Drive

If you create multiple logical drives in your system, see "Re-installing the Operation System if Multiple Logical Drives Exist" (5-96).

Updating System

If you modified the Windows system, execute "Update the system" in the Autorun Menu.

Installing on the Mirrored Volume

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

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

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

About Removable Media

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

Floppy Disk Drive

The internal floppy disk drive is not included in your system at the standard configuration. Prepare the optional USB floppy disk drive or Flash FDD if necessary.

About the System Partition Size

The system partition size can be calculated from the following formula.

When the system is Windows Server 2008 64-bit (x64) Edition:

Required partition size =

size required to install OS + paging file size + dump file size + application size

Size required to install OS	= 11,600MB (Full Installation)
	12,300MB (Full Installation with Service Pack 2)
	16,720MB (Full Installation + Service Pack 2)
	or
	= 4,100MB (Server Core Installation)
	4,800MB (Server Core Installation with Service Pack 2)
	9,220MB (Server Core Installation + Service Pack 2)
Paging file size (recommended)	= Installed memory size * 1.5
Dump file size	= Installed memory size + 300MB
Application size	= Required size

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
 - Regardless of the size of the mounted memory, or the Write debugging information (type of memory dump), the maximum size of the dump file is 'The size of the mounted memory + 300MB'.
 - If you install any application program or the like, add necessary space to the partition to install these programs.
-

Example:

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

$$11,600\text{MB} + (1,024\text{MB} * 1.5) + (1,024\text{MB} + 300\text{MB}) + \text{application size} \\ = 14,460\text{MB} + \text{application size}.$$

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

1. Set the system partition size to a size sufficient to install the OS and paging file.
2. See "Setting for Solving Problems" to write the debug information of the dump file onto another disk.

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

When the system is Windows Server 2008 32-bit (x86) Edition

Required partition size =

size required to install OS + paging file size + dump file size + application size

Size required to install OS	= 6,300MB (Full Installation) 9,300MB (Full Installation with Service Pack2) 9,400MB (Full Installation + Service Pack 2) or = 2,200MB (Server Core Installation) 5,200MB (Server Core Installation with Service Pack2) 5,300MB (Server Core Installation + Service Pack 2)
Paging file size (recommended)	= Installed memory size * 1.5
Dump file size	= Installed memory size + 300MB
Application size	= Required size

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
 - Depending on system configuration, 4096MB or more per partition might not be able to be set to the paging file size.
Set it to 4095MB when the message to ask a value that is smaller than 4096MB is displayed.
 - The maximum dump file size for the system with more than 2GB memory mounted is '2048MB + 300MB'.
 - If you install any application program or the like, add necessary space to the partition to install these programs.
-

Example:

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

$$\begin{aligned} &6,300\text{MB} + (1,024\text{MB} * 1.5) + 1,024\text{MB} + 300\text{MB} + \text{application size} \\ &= 9,160\text{MB} + \text{application size.} \end{aligned}$$

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

1. Set the partition size to a size sufficient to install the OS and paging file.
2. See "Setting for Solving Problems" to write the debug information of the dump file onto another disk.

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

BitLocker

If you use BitLocker, note the following:

- Before you install Windows Server 2008, create two partitions:
 - System partition for a loader
 - Boot partition for the operating system

NOTE: For more information, see the following documentation in Microsoft TechNet.

"Windows BitLocker Drive Encryption Step-by-Step Guide"

- Be sure to keep the recovery password secure. Do not keep it around a server running BitLocker.

IMPORTANT: Without the recovery password, you cannot start the operating system and see the partition content encrypted by BitLocker.

The recovery password may be needed when you start the operating system after performing the following tasks:

- Replacing the motherboard
 - Initializing the TPM
 - Changing the BIOS setting
-

- Windows Server 2008 is not installed in the partition encrypted by BitLocker.

INSTALLING Windows Server 2008

Preparations for Installation

- NEC EXPRESSBUILDER DVD
- Microsoft Windows Server 2008 Standard (DVD-ROM) / Microsoft Windows Server 2008 Enterprise (DVD-ROM)
- User's Guide
- Getting Started

Windows Server 2008 Clean Installation

This section explains how to perform a clean installation of Windows Server 2008.

IMPORTANT: The installation procedure depends on your environment.

Follow steps below appropriate to your environment.

1. Turn on your system.

IMPORTANT: To install Windows Server 2008, you may need to update BIOS. To check if your system needs a BIOS update, go to: <http://www.nec.com/express/>

2. Insert the Windows Server 2008 DVD-ROM into your DVD-ROM drive.
3. Restart the system.
To restart the system, press **Ctrl + Alt + Del** or turn off the system once, and then turn it on again.

IMPORTANT: When prompted to [press any key to boot from CD or DVD], press **Enter** while the message is displayed. If the Windows installation screen (shown in step 4) does not appear, turn off the system, and then turn it on again.

The DVD-ROM starts. A message "Windows is loading files ..." appears.

4. Select a language and other options from the drop-down lists, and then click [Next].

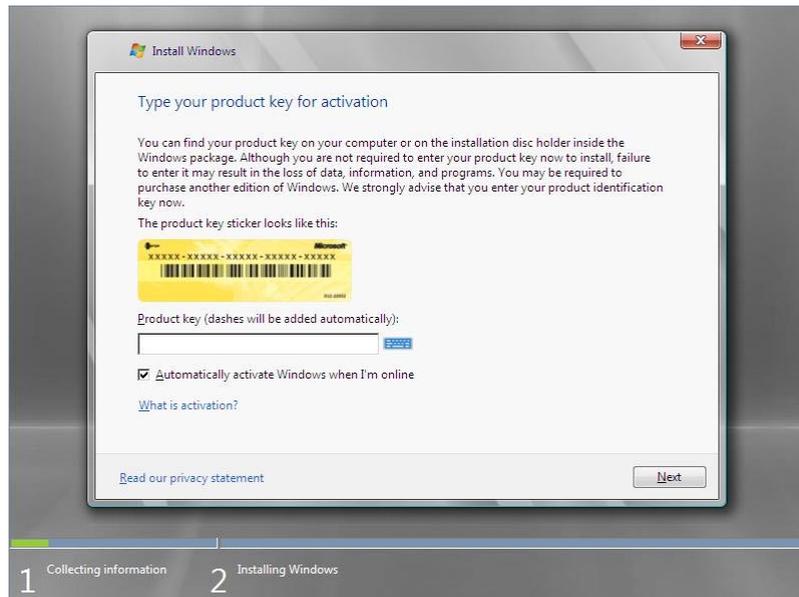


5. Click the [Install now ] button.

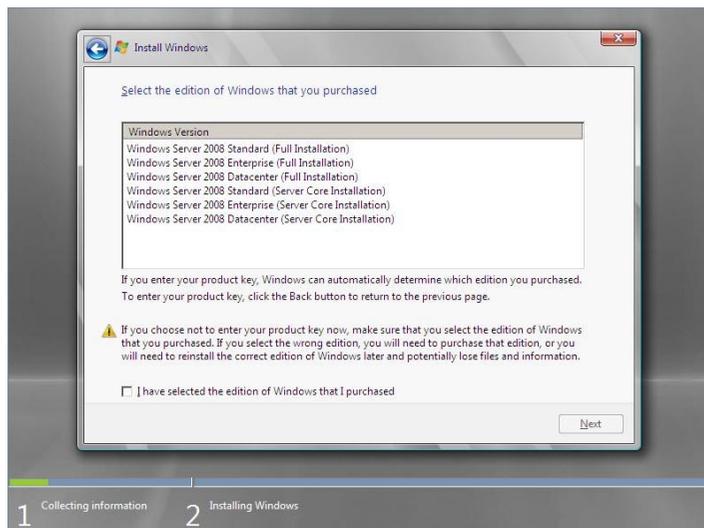
The installation starts.



6. Enter your product key, and then click [Next].

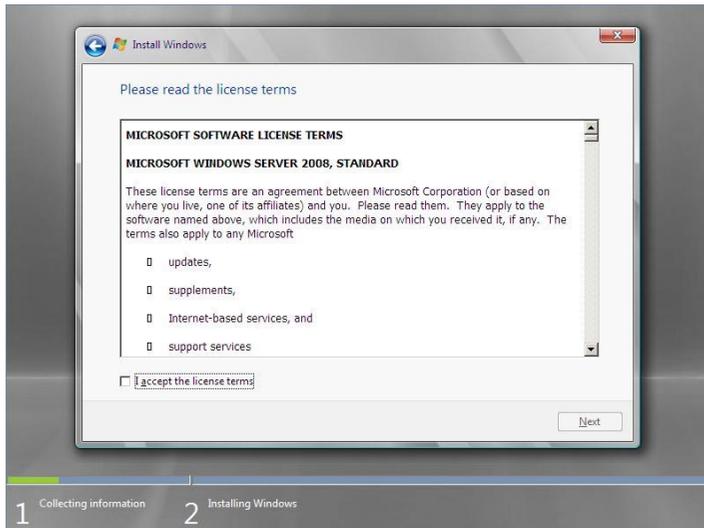


7. Select the edition of the Windows operating system that you purchased.
Select [I have selected the edition of Windows that I purchased], and then click [Next].
You will see only possible editions that have been determined by Windows based on the key you entered in step 6.

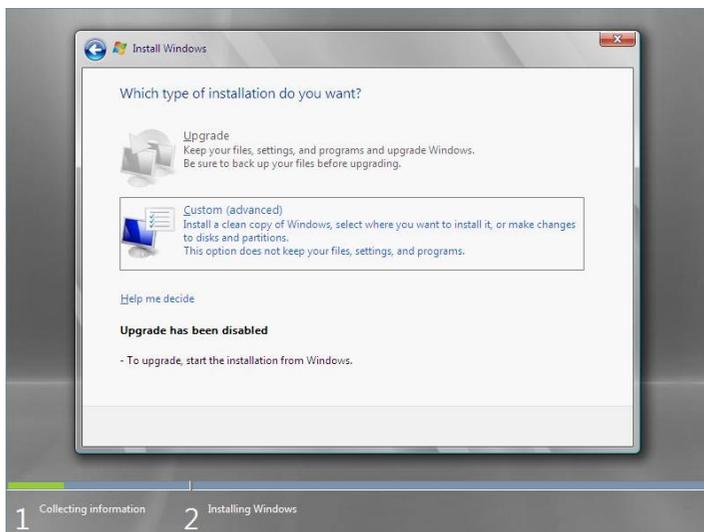


NOTE: The Windows versions listed on the screen vary depending on the Windows Server 2008 DVD-ROM you are using.

8. Read the license terms carefully. If you agree, select [I accept the license terms], and then click [Next].



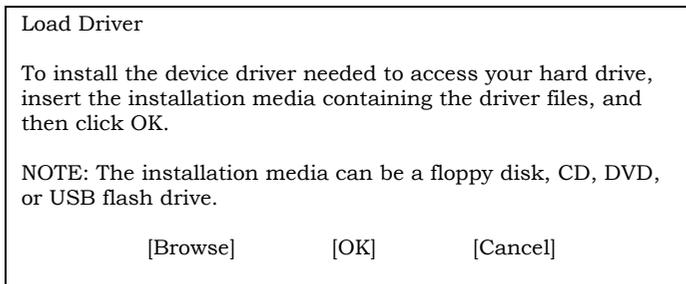
9. Select the type of installation you want.
[Custom (advanced)] is selected below.



10. The screen of "Where do you want to install Windows?" is displayed.

NOTE: If the RAID Controller is not used, go to Step 13.

Remove the Backup DVD-ROM or Windows Server 2008 DVD-ROM and set EXPRESSBUILDER, and select [Load Driver].



Click [Browse], and go to Step 11.

11. The folder reference dialog box appears.

Select a path in the NEC EXPRESSBUILDER DVD, and then click [OK].

- If the Onboard RAID Controller (LSI Embedded MegaRAID™) is used:
 - Windows Server 2008 32-bit (x86) Edition
<drive letter>:\018\win\winnt\oemfd\ws2008\fd1\megasr1
 - Windows Server 2008 64-bit (x64) Edition
<drive letter>:\018\win\winnt\oemfd\ws2008x64\fd1\megasr1
- If the N8103-129/130 RAID Controller is used:
 - Windows Server 2008 32-bit (x86) Edition
<drive letter>:\018\win\winnt\oemfd\ws2008\fd1\megasas2
 - Windows Server 2008 64-bit (x64) Edition
<drive letter>:\018\win\winnt\oemfd\ws2008x64\fd1\megasas2
- If the N8103-134 RAID Controller is used:
 - Windows Server 2008 32-bit (x86) Edition
<drive letter>:\018\win\winnt\oemfd\ws2008\fd1\stexstpt
 - Windows Server 2008 64-bit (x64) Edition
<drive letter>:\018\win\winnt\oemfd\ws2008x64\fd1\stexstpt

After you select the path, a list of drivers is displayed.

Select the following driver, and then click [OK]. Go to Step 12.

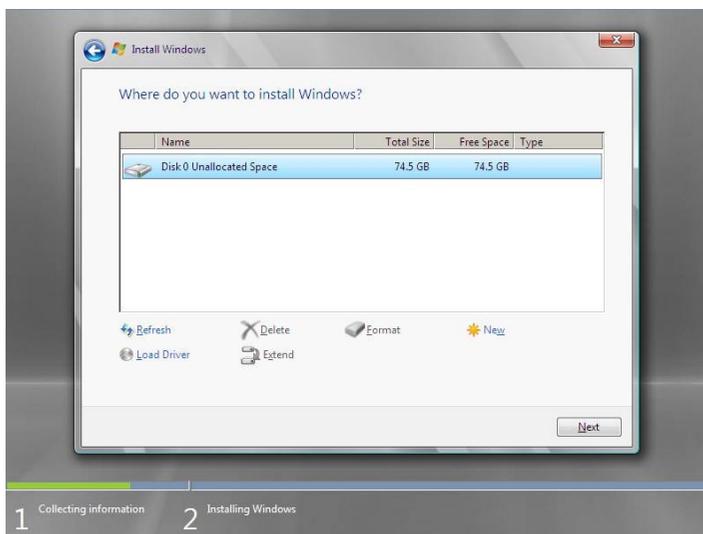
- If the Onboard RAID Controller (LSI Embedded MegaRAID™) is used:
 - [LSI Embedded MegaRAID]
- If the N8103-129/130 RAID Controller is used:
 - [LSI MegaRAID SAS 9264-8i]

- If the N8103-134 RAID Controller is used:
[Promise SuperTrak SAS 6G RAID Controller]

12. Remove the NEC EXPRESSBUILDER and set Backup DVD-ROM or Windows Server 2008 DVD-ROM.
13. Select the disk where a partition will be created, and then click [Drive Option].

IMPORTANT: If the partition has already been created, go to step 16.

14. Click [New], enter a partition size, and then click [Apply].
15. Select the partition created in step 14, and then click [Format].
16. Select the partition created, and then click [Next].



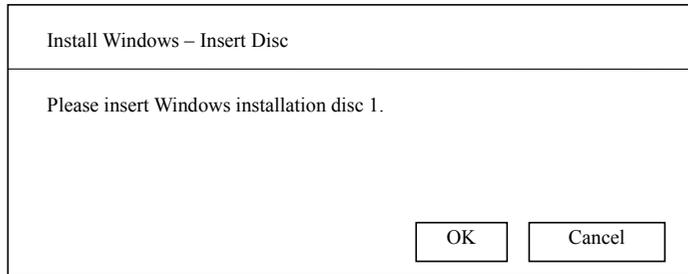
When the following message appears, the installation starts automatically.

Installing Windows ...

That's all information we need right now. Your computer will restart several times during installation.

- ✓ Copying files
- Expanding files
- Installing features
- Installing updates
- Completing installation

NOTE: If the disk drive contains NEC EXPRESSBUILDER DVD, you will be prompted to replace a media with that for OS installation. Insert the install media according to the on-screen message.



17. Log on to the system. The steps vary depending on the edition you selected in step 10.

If you have selected a full installation

1. After a full installation of Windows Server 2008 is completed, the following dialog box will prompt you to set or change the password before you log on. Click [OK].



2. Change the password, and then click the  button.



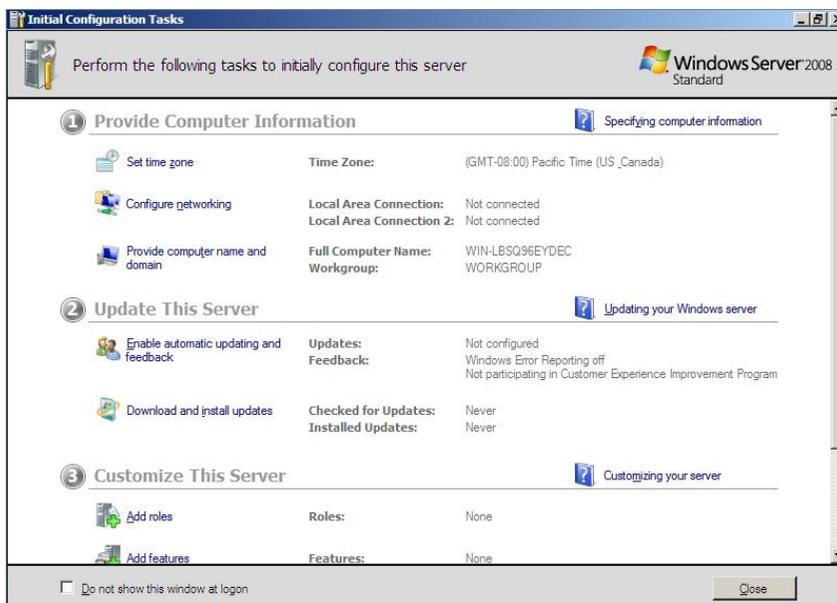
NOTE: Administrator password that satisfy the next condition, are required.

- More than 6 characters
 - Contains characters from three of the following categories (numbers, uppercase letters, lowercase letters, and signs)
-

3. When the following message appears, click [OK] to log on.



4. On the [Initial Configuration Tasks] window, enter user information.



If you have selected a Server Core installation

1. After a Server Core installation of Windows Server 2008 is completed, press **Ctrl + Alt + Del**.



2. Select [Other User].



3. Log on to the system as an administrator.
You need not enter your password in this dialog box. Click the  button.



4. Before you log on, you will be prompted to change the password. Click [OK].



5. Change the password, and then click the  button.



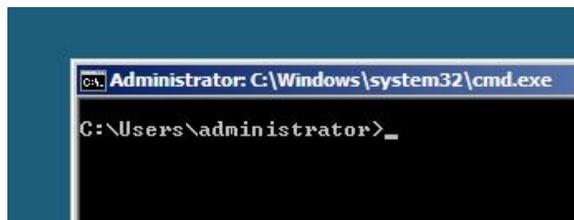
NOTE: Administrator passwords that satisfy the next condition, are required.

- More than 6 characters
 - Contains characters from three of the following categories (numbers, uppercase letters, lowercase letters, and signs)
-

6. When the following message appears, click [OK].



7. At the command prompt, enter user information.



NOTE: For more detailed procedure, see the "Microsoft Windows Server 2008 Step-By-Step Guide".

After installation is completed, be sure to execute the tasks described in "Setup of Device Driver (Normally Install in Server)" and "Updating the System" of this chapter.

Procedure for License Authentication

Product Key used in the procedure for license authentication should be matched with the COA label in which the product key contained in Windows Server 2008 is written.

NOTES:

- Execute the activation within 60 days.
 - COA label may be attached to your server.
-

Updating the System

IMPORTANT:

- "Updating the System" disables the Scalable Networking Pack (SNP) function.
The setting of SNP function may affect the system performance, so please refer to the attention of SNP detail in the following site before setting it.

<http://www.nec.com/global/prod/express/>
 - Refer to the public information of SNP function when KB967224 is not applied. Notes are described about KB967224.
-

Update the system in the situation below:

- CPU is expanded (expanded to single processor to multi-processor).
- Modified system configuration.
- Recovered the system using recovery process.

The system update brings the correction program provided by Microsoft to be applied to reinforce the system security.

The system update is recommended.

Application Process of "Updating the System"

"Updating the System" applies the drivers necessary for NEC Express5800 Series.

1. Log on to the system using an administrator account.
2. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive.
3. Hereinafter, the setup process is depending on the content selected at [Installing Windows Server 2008], follow each of the instructions.

- If you have selected a full installation

If the menu is displayed, click [Setup Windows] and click [Update the system].

NOTE: Right-clicking on the Menu produces the same outcome.

- If you have selected a Server Core installation

- 1) Execute the following command line from command prompt to specify the optical disk drive (e.g. D drive).

```
cd /d d:\018\win\winnt\bin\oschk
```

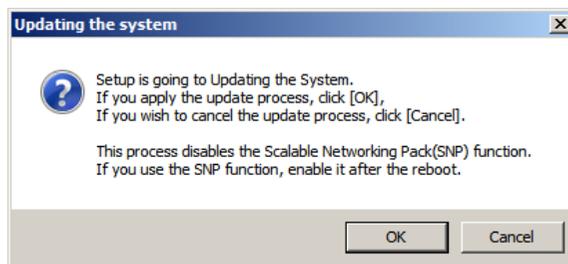
```
C:\Users\administrator>cd /d D:\018\win\winnt\bin\oschk
```

- 2) Type following command line and press **Enter**.

```
oschk.bat
```

```
D:\018\win\winnt\bin\oschk>oschk.bat
```

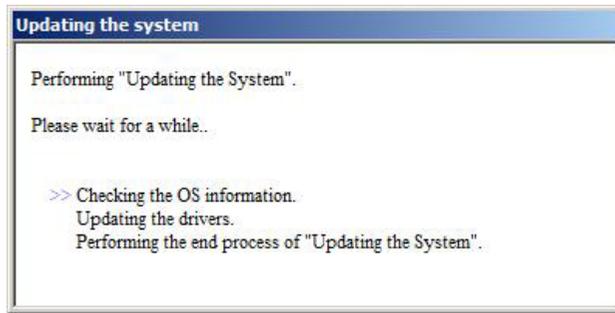
4. The following box appears.



5. Read the message, and then click [OK].

The update starts.

NOTE: The following box appears during the update if you have deployed a full installation of Windows Server 2008. Wait until the update completes.



6. When the following message appears, click [OK] to restart the system.



The system has been updated.

DRIVER INSTALLATION AND ADVANCED SETTINGS

This section describes on how to install and setup various standard drivers mounted on the device.

For the information on installing and setting up the driver that is not described in this section, please refer to the document attached to the driver.

LAN Driver and PROSet

Please refer to Chapter 5 "Installing and Setting Device Drivers" for Windows Server 2008 to install and setup LAN driver and PROSet.

Graphics Accelerator Driver

If you use standard graphics accelerator drivers, update your system with NEC EXPRESSBUILDER DVD attached to your system.

Standard graphics accelerator drivers will be installed automatically.

NOTE: <Windows Server 2008>

The graphics accelerator driver is supported only on a server running a full installation. Use VGA on a server running a Server Core installation.

Please follow the following procedure when you want to reinstall the driver individually.

1. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive.
If the autorun menu is displayed, close menu screen.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "install.bat" in the following directory.
 - Windows Server 2008 64-bit (x64) Edition:
 \018\win\winnt\ws2008x64\video
 - Windows Server 2008 32-bit (x86) Edition:
 \018\win\winnt\ws2008\video
4. Follow the message to continue the installation.
If the dialog message "Digital Signature could not be found." appears, select [Yes] to continue.
5. Remove the NEC EXPRESSBUILDER DVD from the optical disk drive, restart the system.

Installing SCSI Controller Driver (N8103-107)

If you use the SCSI Controller N8103-107, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing SAS Controller Driver (N8103-104A)

If you use the SAS Controller N8103-104A, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing RAID Controller Driver (N8103-135)

If you use the RAID Controller N8103-135, you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

Installing the Fibre Channel Controller Driver (N8190-127/131/153/154)

If you use the Fibre Channel Controller (N8190-127/131/153/154), you do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.

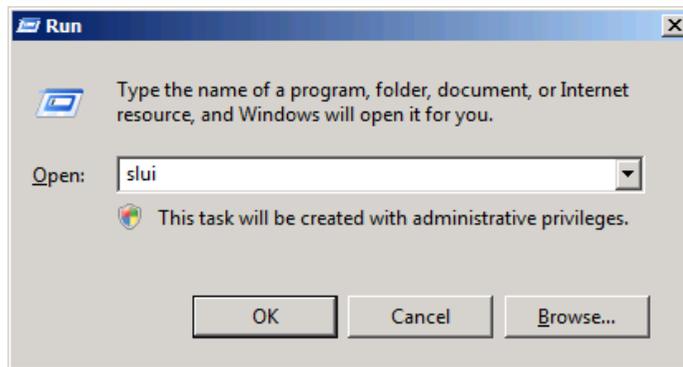
About Windows Activation

Windows Server 2008 must be activated before you can use Windows Server 2008.

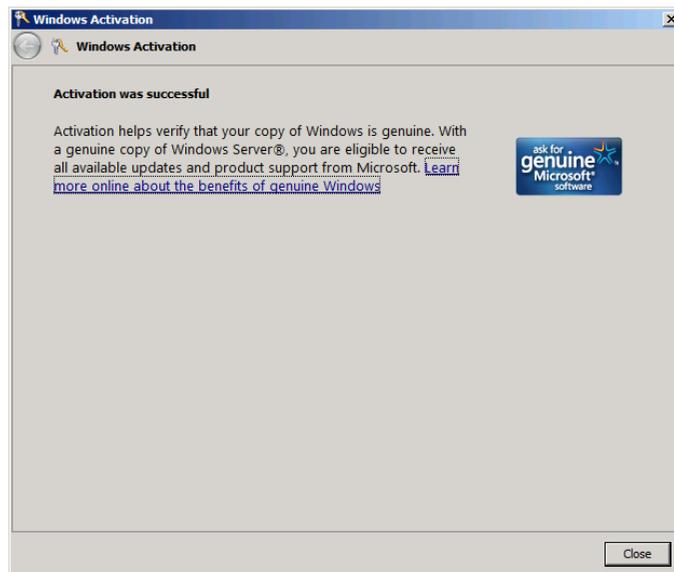
Windows activation process is as follows.

For a server running a full installation

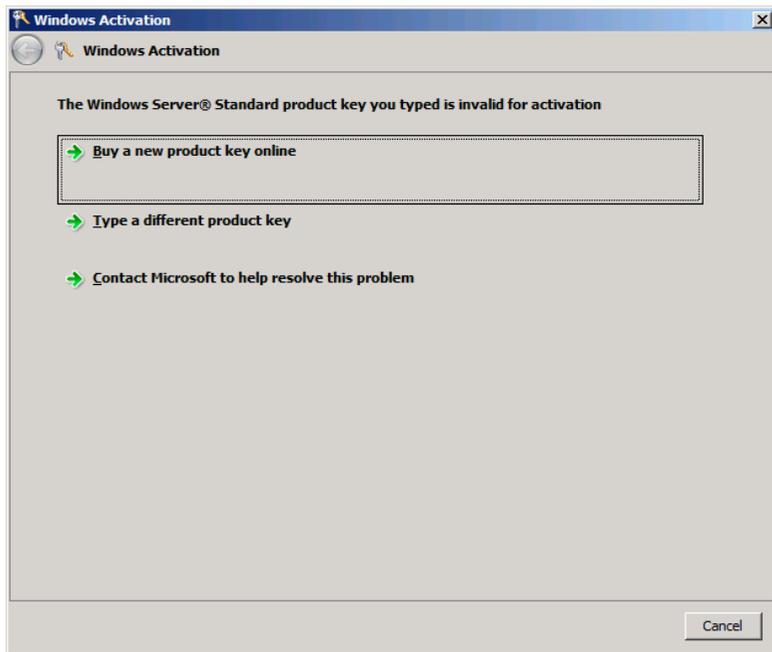
1. Go to the Start menu, and in the Run dialog box, type **slui**, and press **Enter**.



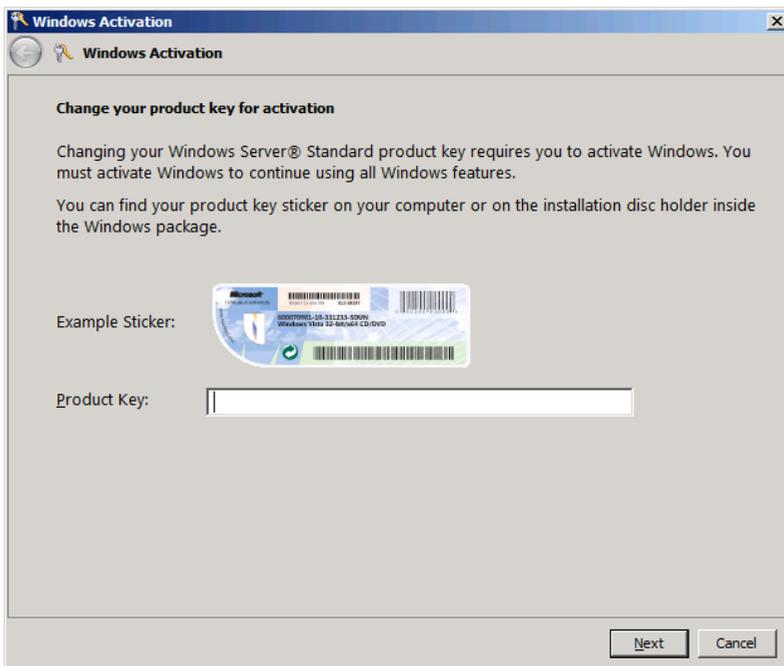
IMPORTANT: If the following message appears, Windows has already been activated on your system. Click [Close] to exit.



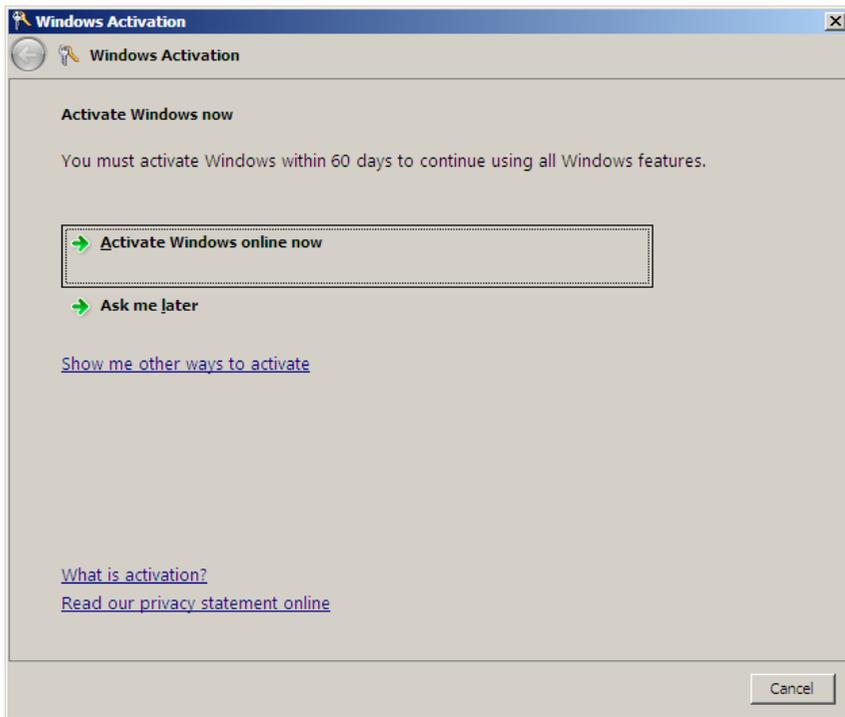
2. In the following screen, click [Type a different product key].



3. Type the product key shown on your COA label, and click [Next].



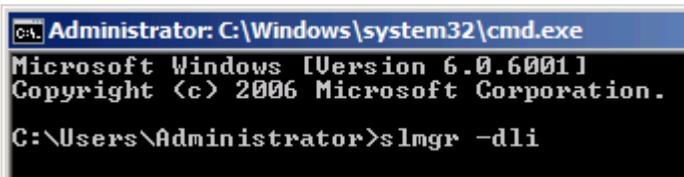
4. Activate Windows.



The Windows activation is complete.

For a server running a Server Core installation

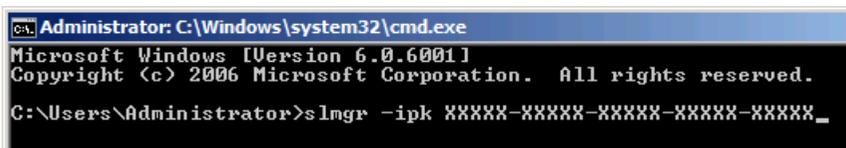
1. At the command prompt, type **slmgr -dli**, and press **Enter**.



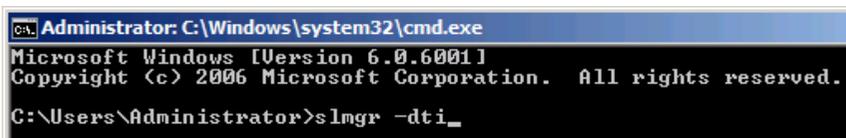
IMPORTANT: If the following message appears, Windows has already been activated on your system. Click  to exit.



2. Type **slmgr -ipk <PID>**, and press **Enter**.
* PID is your product key on the COA label.



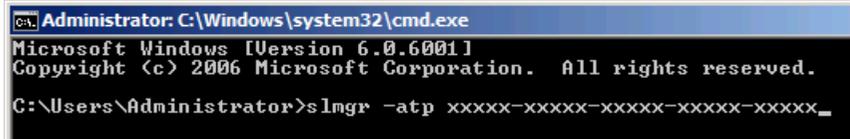
3. Type **slmgr -dti** to obtain an installation ID for Windows activation, and press **Enter**.



4. See "%systemroot%\system32\slui\phone.inf" for the phone number of the Microsoft customer service.
5. Call the above number, inform the representative of the installation ID which you obtained in step 3, and receive a confirmation ID.

6. At the command prompt, type **slmgr -atp <CID>**, and press **Enter**.

* CID is the confirmation ID that you received from the call center.



```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.0.6001]
Copyright (c) 2006 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>slmgr -atp xxxxx-xxxxx-xxxxx-xxxxx-xxxxx_
```

The Windows activation is complete.

The procedure to set PAE option

If your 32-bit system has a memory capacity in excess of 4GB, setting PAE option will enable the system to be installed with over 4GB of memory.

IMPORTANT: "PAE option" is not supported on Windows Server 2008 Standard.

In Windows Server 2008 system, the PAE option can be set by using Bcdedit.exe.

The setting procedure is as follows.

1. Click [Run] on [Start] menu.
2. Type "cmd.exe" in the [Open:] box to start command prompt.
3. Execute following command line.

```
bcdedit /set pae forceenable
```

4. Restart the system.

The setting mentioned above enables after reboot.

5. Execute following command line on command prompt.

```
bcdedit
```

Confirm "pae ForceEnable" exists in "Windows boot loader".

The setting for PAE option is now completed.

Refer following site about Bcdedit.exe.

"Boot Configuration Data Editor Frequently Asked Questions"

[http://technet.microsoft.com/en-us/library/cc721886\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/cc721886(WS.10).aspx)

SETTING FOR SOLVING PROBLEMS

Set for collecting memory dump using the procedure described in Chapter 5.

Appendix F

Installing Windows Server 2003 x64 Editions

This section explains how to install the Windows Server 2003 x64 Editions.

NOTICE

Read the following notes or information before installing the Windows Server 2003 x64 Editions.

Optional Board Supported by NEC EXPRESSBUILDER

The NEC EXPRESSBUILDER DVD attached to your server supports the following optional boards;

NOTE: If you want to install the other boards by using a driver floppy disk ("OEM-Disk for Mass storage device"), except ones listed below, see "Installing with the OEM-Disk for Mass storage device".

- Controllers supporting installation of OS with Express Setup
 - N8103-129 RAID Controller (256 MB, RAID0/1)*
 - N8103-130 RAID Controller (256 MB, RAID0/1/5/6)*
 - N8103-134 RAID Controller (512 MB, RAID0/1/5/6)*
 - Onboard RAID Controller (LSI Embedded MegaRAID™)
 - Other controllers
 - N8103-104A SAS Controller*
 - N8103-107 SCSI Controller*
 - N8103-135 RAID Controller (512 MB, RAID0/1/5/6)*
- * Option.

Service Pack Which NEC EXPRESSBUILDER Supports

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

- Windows Server 2003 R2 x64 Edition
 - OS installation media (with Service Pack 2)
 - OS installation media (No Service Pack) + Service Pack 2
 - OS installation media (No Service Pack)

Installing Service Pack

You can install the Service Pack on the server. When the Service Pack is not attached to your system, prepare it by yourself.

Connecting Hard Disk Drive

If you create multiple logical drives in your system, see "Re-installing the Operation System if Multiple Logical Drives Exist" (5-96).

Updating System

If you modified the Windows system, execute "Update the system" in the Autorun Menu.

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

If you want to leave the existing partition when installing the system on the hard disk drive upgraded to Dynamic Disk, note the following issue:

- Do not select the partition that OS had been installed as the partition to install the OS newly.
- Select "Use the current File System" for the format of OS partition.

About Removable Media

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

Floppy Disk Drive

The internal floppy disk drive is not included in your system at the standard configuration. Prepare the optional USB floppy disk drive or Flash FDD if necessary.

About the System Partition Size

The system partition size can be calculated from the following formula.

$$\begin{aligned} & \text{Size necessary to install the system} + \text{Paging File Size} + \text{Dump File Size} \\ & \quad + \text{Application Size} \\ \text{Size necessary to install the system} & = 4100\text{MB (Windows Server 2003 x64 Editions)} \\ & = 4100\text{MB (Windows Server 2003 x64 Editions with} \\ & \quad \text{ServicePack 2)} \\ & = 5900\text{MB (Windows Server 2003 x64 Editions +} \\ & \quad \text{Service Pack 2 CD-ROM)} \\ \text{Paging File Size (Recommended)} & = \text{Mounted Memory Size} * 1.5 \\ \text{Dump file Size} & = \text{Mounted Memory Size} + 1\text{MB} \\ \text{Application Size} & = \text{Required Size} \end{aligned}$$

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
 - Regardless of the size of the mounted memory, or the Write debugging information (type of memory dump), the maximum size of the dump file is 'The size of the mounted memory + 1MB'.
 - If you install any application program or the like, add necessary space to the partition to install these programs.
-

For example, if the mounted memory size is 1G(1,024MB), the partition size will be calculated by the above formula as follows:

$$\begin{aligned} & 4,100\text{MB} + (1,024\text{MB} * 1.5) + (1,024\text{MB} + 1\text{MB}) + \text{Application Size} \\ & = 6,661\text{MB} + \text{Application Size} \end{aligned}$$

Dividing into the partition of the recommended size into multiple disks as written below will solve problem that it cannot be reserved in one disk.

1. Set the "Size required for installation + Paging file size".
2. See Chapter 5 and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.

(If the disk does not have enough free space to enable the dump file size to be written, then after installing the system using the "Size required for installation + Paging file size", install an additional new disk.)

INSTALLING Windows Server 2003 x64 Editions

Preparations for Installation

- NEC EXPRESSBUILDER DVD
- Microsoft Windows Server 2003 R2 Standard x64 Edition (CD-ROM) / Microsoft Windows Server 2003 R2 Enterprise x64 Edition (CD-ROM)
- Windows Server 2003 x64 Editions Service Pack 2 (CD-ROM)
- User's Guide
- Getting Started
- Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER

Creating "Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER"

Before installing, create Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER.

NOTE: If you have already "Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER" for NEC Express5800 Server which you are going to install Windows Server 2003 x64 Editions, you do not need to create it again.

You can create Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER with the following two procedures.

Create from the menu which appears when running NEC Express5800 Server with NEC EXPRESSBUILDER.

If you have only NEC Express5800 Server to create Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER, use this procedure.

If Windows Server 2003 or Windows can be operated on NEC Express5800 Server, you can use the other procedure described later.

Follow the steps below.

1. Prepare one Flash FDD, or one USB floppy disk drive and 3.5-inch floppy disk.
2. Turn on your NEC Express5800 Server.
3. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive of the server.
4. Press the RESET switch or press **Ctrl, Alt** and **Delete** to reboot the server. (You may also turn off and then on again to reboot the server.)

The system will boot from the DVD-ROM and NEC EXPRESSBUILDER starts.

5. Select [Create the OEM-Disk for Windows] from [Tools Menu] step.
6. Connect the Flash FDD or the USB floppy disk drive. (If you use the floppy disk drive, insert a floppy disk into it.)
7. Select [Create an Windows Server 2003 x64 Editions OEM-Disk for EXPRESSBUILDER] at [Create OEM-Disk] and click [Perform].
8. Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER will be created.

Write-protect and attach a label, then keep it safely.

IMPORTANT: If you have created "OEM-Disk" into the Flash FDD, disconnect it after the NEC EXPRESSBUILDER had been shutdown.

NOTE: If the following message is displayed, the floppy disk is write-protected.



Cancel write-protected state.

If you have already cancelled write-protected state, connect the floppy disk drive again.

Create from [Autorun Menu]

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

You can create Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER from [Autorun Menu], if you have the computer on which the above operating systems operate.

Follow the steps below.

1. Prepare one Flash FDD, or one USB floppy disk drive and 3.5-inch floppy disk.
2. Start the Operating System.
3. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive of the server.
The Menu will appear.
4. Connect the Flash FDD or the USB floppy disk drive. (If you use the floppy disk drive, insert a floppy disk into it.)
5. Click [Create drive disk] and select [OEM-Disk for Windows Server 2003 x64 Edition].

NOTE: You can do the same operation with the menu appeared by the Right-click.

6. Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER will be created.
Write-protect and attach a label, then keep it safely.

Windows Server 2003 x64 Editions Clean Installation

This section explains how to perform a clean installation of Windows Server 2003 x64 Editions.

IMPORTANT:

- If you have created the OEM-Disk into the Flash FDD, connect the Flash FDD before you start the system.
 - If you have created OEM-Disk into the floppy disk, connect the USB floppy disk drive before you start the system.
-

1. Turn on the system power.
2. Insert the Windows Server 2003 x64 Edition CD-ROM into the optical disk drive.
3. Press **Ctrl + Alt + Delete** to reset the system.

After a bootable operating system has been installed on the hard disk drive, press **Enter** while the message "Press any key to boot from CD..." is displayed at the top of the screen.

If no bootable operating system exists on the hard disk drive, this step is unnecessary.

The Windows Server 2003 x64 Editions setup screen will appear.

If the screen is not displayed, **Enter** was not pressed properly.

Begin after turning on the system power again.

4. If the RAID Controller/Option Controller is used, press **F6** in a few seconds when the window is in either of the following states.
 - "Setup is inspecting your computer's hardware configuration ..." or "Press F6 if you need to install a third party SCSI or RAID driver..." is displayed.
 - A screen with a solid blue background is displayed.

IMPORTANT:

- There is no visible indication on screen when F6 has been pressed.
 - If the RAID Controller/Option Controller is not used, you do not need to press **F6**, and go to Step 12.
-

5. The following message is displayed.

Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter. Currently, Setup will load support for the following mass storage devices.

<If the RAID Controller is used>
Press **S**, and go to Step 6.

<If the RAID Controller is not used>
Go to Step 8.

6. The following message is displayed.

Please insert the disk labeled
manufacturer-supplied hardware support disk
into Drive A:
*Press ENTER when ready.

If you use the floppy disk drive, insert the Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER into the floppy disk drive, and press **Enter**.

NOTE: If you use the Flash FDD, the message above is not displayed.

A list of mass storage devices is displayed.

IMPORTANT: If you have created the OEM-Disk into the Flash FDD, connect the Flash FDD before you start the system.

7. Select the proper RAID Controller and press **Enter**.
- [LSI Embedded MegaRAID (Windows XP/2003 64-bit)]
(When Onboard RAID Controller (LSI Embedded MegaRAID™) is used.)
 - [LSI MegaRAID SAS RAID Controller Driver (Server 2003 for x64)]
(When N8103-129/130 RAID Controller is installed.)
 - [Promise SuperTrak EX Family Controller - 64bits platform]
(When N8103-134 RAID Controller is installed.)

The screen of Step 5 is displayed.

8. <If the SCSI Controller N8103-107 is connected>
Press **S**.

IMPORTANT:

- Insert the Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER into the floppy disk drive. If the floppy disk drive has already contained Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER, you do not need to insert the Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER.
 - If you have created the OEM-Disk into the Flash FDD, connect the Flash FDD before you start the system.
-

The screen of Step 6 is displayed. Press **Enter**, and go to Step 9.

- <If the SCSI Controller N8103-107 is not connected>
Go to Step 10.

9. A list of mass storage devices is displayed.

Select the [Adaptec Ultra320 SCSI Cards (Windows 64-bit)] and press **Enter**.

IMPORTANT: If the following message is displayed when you use the N8103-107 SCSI controller, press **S**.

The driver you provided seems to be newer than the Windows default driver. Windows already has a driver that you can use for "Adaptec Ultra 320 SCSI Cards (Windows64-bit)". Unless the device manufacturer prefers that you use the driver on the floppy disk, you should use the driver in Windows.

The screen of Step 5 is displayed.

Go to Step 10.

10. <If the SAS Controller N8103-104A is connected>

Press **S**.

IMPORTANT:

- Insert the Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER into the floppy disk drive. If the floppy disk drive has already contained Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER, you do not need to insert the Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER.
 - If you have created the OEM-Disk into the Flash FDD, connect the Flash FDD before you start the system.
-

The screen of Step 6 is displayed. Press **Enter**, and go to Step 11.

<If the SAS Controller N8103-104A is not connected>

Press **Enter**, and go to Step 12.

11. A list of mass storage devices is displayed.

Select the [LSI Fusion-MPT SAS Driver (Server 2003 x64)] and press **Enter**.

The screen of Step 5 is displayed.

Press **Enter**, and go to Step 12.

12. When the following message is shown, press **Enter** to start "Welcome to Setup".



IMPORTANT: If you install Windows Server 2003 x64 Editions on the hard disk larger than 2,097,152MB (2TB), you can specify only a value equal to or less than 2,097,152MB as partition size.

13. When the installation of Windows Server 2003 x64 Edition has finished, the system reboots automatically.
14. The [Windows Setup] screen will be displayed after logged on to the system.



IMPORTANT:

- In this case, the [Windows Setup] screen may not be displayed. Be sure to install Microsoft Windows Server 2003 R2 x64 Edition DISC 2 according to the following procedures.
 - You can install Microsoft Windows Server 2003 R2 x64 Edition DISC 2 after the application of "System update". Be sure to install Microsoft Windows Server 2003 R2 x64 Edition DISC 2. In this case, note that the [Windows Setup] screen is not displayed.
-

15. Insert Microsoft Windows Server 2003 R2 x64 Edition DISC 2 CD-ROM into the optical disk drive. Confirm the parameters and click [OK].
16. When the installation has completed, remove Microsoft Windows Server 2003 R2 x64 Edition DISC 2 CD-ROM from the optical disk drive, and restart the system. After installation is completed, be sure to execute the tasks described in "Driver Installation and Advanced Settings" and "Updating the System" of this chapter.

Procedure for License Authentication

Product Key used in the procedure for license authentication should be matched with the COA label in which the product key contained in Windows Server 2003 x64 Editions is written.

NOTES:

- Execute the activation within 30 days. System may be locked after 30 days is passed.
 - COA label may be attached to your server.
-

Updating the System - Applying Service Pack -

Update the system in the situation below:

- CPU is expanded (expanded to single processor to multi-processor).
- Modified system configuration.
- Recovered the system using recovery process.

The system update brings the correction program provided by Microsoft to be applied to reinforce the system security. The system update is recommended.

It is necessary to use ServicePack2 or later. ServicePack 2 need not be applied again when Windows Server 2003 x64 Editions CD-ROM where ServicePack 2 is included is used and it is installed.

If you install Windows Server 2003 x64 Editions CD-ROM which contains Service Pack 2, you do not have to apply "Hotfix for Windows x64" or "Hotfix for Windows Server 2003 (KB921411)".

Go to the section of "Updating the System".

Perform "Updating the System" and application of the "Hotfix (KB921411)".

IMPORTANT: In the situation below, make sure to apply "Updating the System" and "Hotfix (KB921411)".

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

NOTES:

- If you use Windows Server 2003 x64 Editions CD-ROM which includes Service Pack 2, the application of "Hotfix (KB921411)" is not required.
- A computer may stop responding on the Resuming Windows screen when the computer resumes from hibernation if running an x64-based version of Windows.

Consider the following scenario:

- * A computer has three or more processors.
- * X64-based version of Windows that is older than Service Pack 2.

In this scenario, the computer may stop responding on the Resuming Windows screen.

When the computer resumes from hibernation, the program to correct the problem of Service Pack 2 or KB902839 (*) is necessary.

(*) KB902839 can be obtained as follows.
<http://support.microsoft.com/kb/902839>

Application Process of the Hotfix (KB921411)

Apply the "Hotfix (KB921411)" before execute "Updating the System".

1. Log on to the system by the account with administrator authority to the server (such as administrator).
2. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive of the server.
3. Click Start menu and [Run], and then execute the following command.

<When Windows Server 2003 x64 Editions is used>

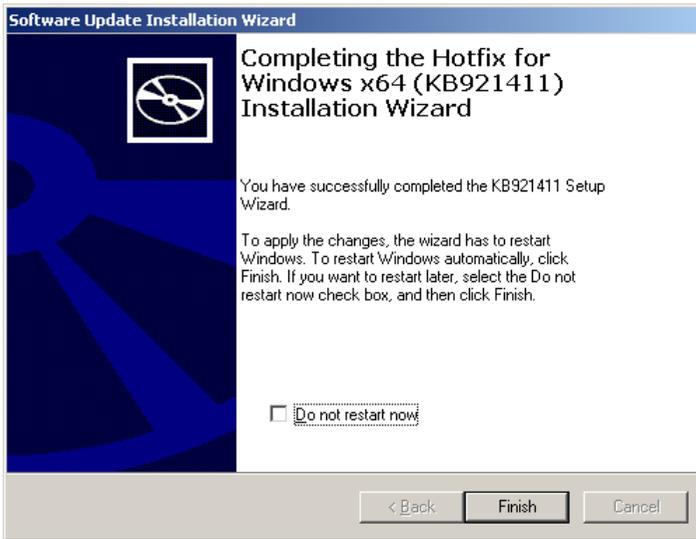
```
\018\win\winnt\w2k3amd\qfe\enu\kb921411.exe
```

4. When the following message is displayed, click [Next].

After that, follow the message to continue the process.



5. When the following message is displayed, make sure to click [Finish] to restart the system.



With that, application process of the Hotfix (KB921411) is finished.

Application Process of "Updating the System"

"Updating the System" applies the drivers necessary for NEC Express5800 Series.

Follow this process after Hotfix for Windows x64 (KB921411) or Hotfix for Windows Server 2003 (KB921411) had been applied.

NOTE: If you install Windows CD-ROM that contains Service Pack 2 to your system, you do not have to apply Service pack 2 again.

1. Log on to the system with the account that has administrative privilege (e.g. administrator).
2. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive of server.
The Autorun Menu will be displayed
3. Left-click on [Setup Windows], and then click [Update the system].

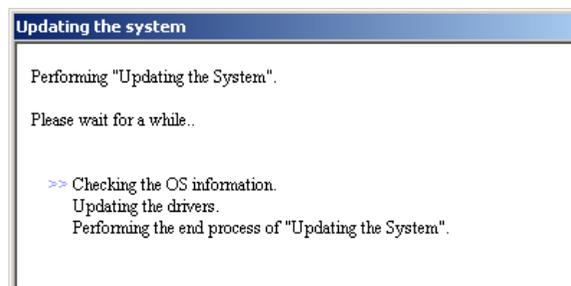
NOTE: Right-clicking on the Autorun Menu produces the same outcome.

4. Follow the message of the screen to proceed the application.

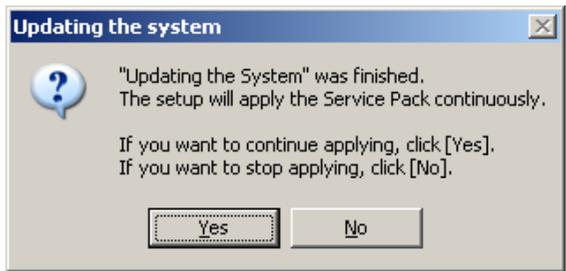
[OK] dialog box will be displayed.



NOTE: The following box appears during the update if you have deployed a full installation of Windows Server 2003 x64 Edition. Wait until the update completes.



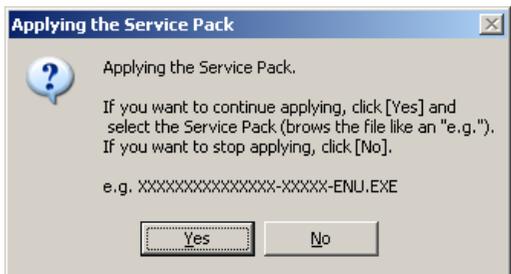
- 5. When the following message appears, "Updating the System" was finished.



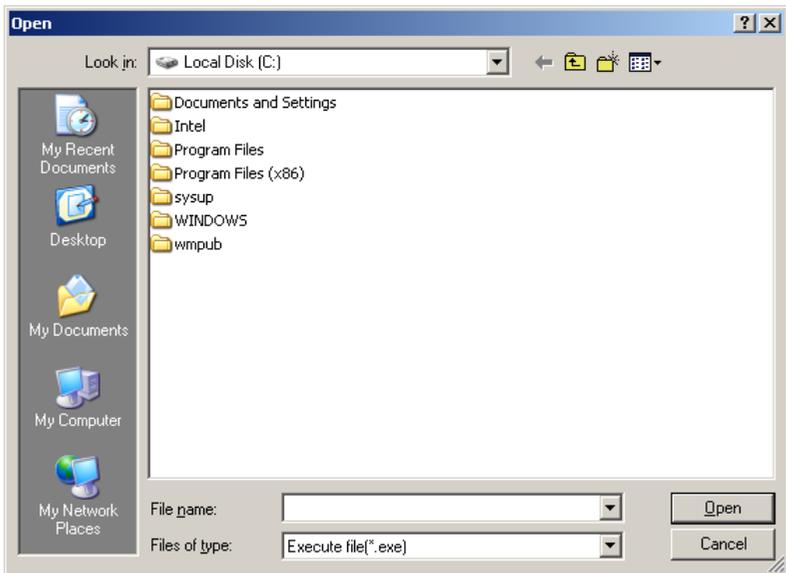
When you apply Service Pack: Click [Yes], and then go to Step 6.

When you don't apply Service Pack: Click [No], and then go to Step 8.

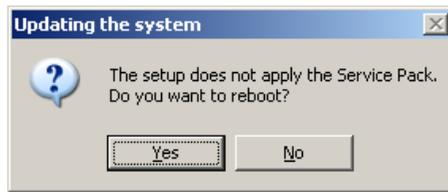
- 6. When the following message appears, click [Yes].



- 7. When the following message appears, select a Service Pack and click [Open] and then, according to a message, please apply it.



8. When the following message appears, click [Yes] to restart the system.



The system has been updated.

Recovery Process

If "Updating the System" is executed before the application of the "Hotfix for Windows x64 (KB921411)", "!" may be displayed on the USB root hub.

If "!" is displayed on the USB root hub, perform application of the "Hotfix for Windows x64 (KB921411)" and the "Updating the System" according to the following process.

1. Start the Windows Explorer, and click [Tools] and [Folder Options].
2. Select [Files and Folders] - [Hidden files and folders] - [Show hidden files and folders] radio button from Advanced settings in the [View] tab.
3. Check off the following check box in the [Files and Folders] from Advanced settings in the [View] tab, and then click [OK].

Hide extensions for know file type

Hide protected operating system files [Recommended]

When the message "You have chosen to display protected operating system files..." is displayed, click [Yes].

4. Make sure of the files.

Open "<System drive:>\WINDOWS\system32\drivers" directory, and make sure usbhub.sys and usbport.sys are exists in the directory.

If you can not found them, copy the files according to the following process.

- (1) Open "<System drive:>\WINDOWS\system32\dllcache" directory.
- (2) Copy usbhub.sys and usbport.sys from the directory noted above to "<Systemdrive:>\WINDOWS\system32\drivers".

5. Restart the system.
6. Refer to [Application process of the Hotfix (KB921411)] and apply the "Hotfix for Windows x64 (KB921411)".
7. Refer to [Application process of "Updating the System"] and execute "Updating the System".
8. Restart the system.

With that, process is finished.

DRIVER INSTALLATION AND ADVANCED SETTINGS

This section describes on how to install and setup various standard drivers mounted on the device.

For the information on installing and setting up the driver that is not described in this section, please refer to the document attached to the driver.

LAN Driver and PROSet

- LAN driver
LAN drivers will be installed automatically.
- PROSet

NOTES:

- All of the operation that related to Intel® PROSet must be executed by administrator privileges. Operation by [Remote Desktop Connection] is prohibited.
Without changing any parameter when opened the properties of adapter teaming, please click the [Cancel] button for close the dialog
Click [OK] button will cause temporary loss of network connectivity.
 - [Internet Protocol (TCP/IP)] check-box is necessary checked to set an IP Addresses. According to the circumstances, the check-box is not checked from begin. Manually checked the check box and set an IP addresses.
-

PROSet is a utility that confirms the function of network contained in network driver.

Utilizing PROSet enables the following items:

- Confirm detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Setup of teaming.

Configuring several network adapters as one team provides the server a tolerant environment on any trouble and enhances throughput between the switches.

PROSet is necessary to utilize these features.

Follow the procedure below to install PROSet.

- 1.** Insert the NEC EXPRESSBUILDER DVD into the optical disk drive.
If the autorun menu is displayed, close menu screen.
- 2.** The [Windows Explorer] dialog starts.
 - * The procedure in the case of the standard start menu
Click Start menu and click [Windows Explorer].
 - * The procedure in the case of the classic start menu
Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
- 3.** Run "dxsetup.exe" in the following directory.
\\018\win\winnt\w2k3amd\r148\apps\prosetdx\winx64
The [Intel(R) PROSet - InstallShield Wizard] dialog starts.
- 4.** Click [Next].
- 5.** Choose "I accept the terms in the license agreement" and click [Next].
- 6.** Click [Next].
- 7.** Click [Install].
- 8.** When [InstallShield Wizard Completed] window is displayed, click [Finished].
- 9.** Remove the NEC EXPRESSBUILDER DVD from the optical disk drive, restart the system.

LAN Driver Setting

■ Link Speed

LAN drivers will be installed automatically, but the link speed and Duplex mode need to be specified manually.

When PROSet is not installed

1. Open the [Device Manager].
2. Double-click [(Network Adapter Name)] in the list.
3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.
4. Click [OK].
5. Restart the system

When PROSet is installed

1. Open the [Device Manager]
2. Double-click [(Network Adapter Name)] in the list.
3. Click the [Link Speed] and specify the [Speed & Duplex] value the same as the value specified for HUB.
4. Click [OK].
5. Restart the system.

■ WOL

Refer to the following procedure for WOL (Wake On LAN) setting.

When PROSet is not installed

1. Start Device Manager.
2. Point to [Network adapters] and double click following adapter.
Open the adapter [Properties].

[Intel(R) 82574L Gigabit Network Connection]
[Intel(R) 82574L Gigabit Network Connection #2]
3. Click [Power Management] tab and change setting in [Wake On LAN] according to the following list.

Setting item	Using WOL	Not using WOL
"Allow the computer to turn off this device to save power"	ON	ON
"Allow this device to bring the computer out of standby"	ON or OFF	OFF

IMPORTANT:

- Set "Allow this device to bring..." "ON", WOL by Directed Packet(*1) or Magic Packet will available on Standby and Hibernate state.
 - WOL by Directed Packet is not available on Shutdown state.
- *1 Packet with the Ethernet address of the adapter in Ethernet header or Packet with an IP address assigned to the adapter in IP header.
-

4. Click [Advanced] tab and point to [Enable PME].
5. Set the "Enable" in [Value].
 - Using WOL: ON
 - Not using WOL: OFF
6. Click [OK].
7. Restart the system

When PROSet is installed

1. Start Device Manager.
2. Point to [Network adapters] and double click following adapter.
Open the adapter [Properties].

[Intel(R) 82574L Gigabit Network Connection]
[Intel(R) 82574L Gigabit Network Connection #2]

3. Click [Power Management] tab and change setting in [Wake On LAN] according to the following list.

Setting item	Using WOL	Not using WOL
"Wake On Directed Packet"	ON or OFF	OFF
"Wake On Magic Packet"	ON	OFF
"Wake on Magic Packet from power off state"	ON	OFF
"Wake on Link"	OFF	OFF

IMPORTANT:

- Directed Packet(*1) will not wake up the system on Shutdown state even "Wake On Directed Packet" is set to "ON".
Only on Standby or Hibernate state will wake up by a Directed Packet.
- The parameters of [Wake On LAN] will not exist, if the network ports are not available for WOL.

*1 Packet with the Ethernet address of the adapter in Ethernet header or Packet with an IP address assigned to the adapter in IP header.

NOTES:

- [Power Saver Options] setting is not necessary to change.
 - Above setting will be maintained until manually resetting are executed.
-

4. Click [OK].
5. Restart the system

IMPORTANT: The parameters of [Wake On LAN] will not exist, if the network ports are not available for WOL.

Setup Team

Adapter Fault Tolerance (AFT) is a feature that creates a group containing more than one adapter and automatically converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

Adaptive Load Balancing (ALB) is a feature that creates a group containing more than one adapter and enhance the through put by operating packet transmission from the server by all the adapters.

This feature includes AFT feature.

Switch Fault Tolerance (SFT) is a feature that provides a failover relationship between two ports when each port is connected to a separate switch.

SFT supports two ports per team.

Static Link Aggregation (SLA) accounts for the GEC and 802.3ad static protocols.

SLA is a switch-assisted teaming mode and requires configuring ports at both ends of the link: server interfaces and switch ports.

IMPORTANT:

- AFT/ALB setup must be operated after installing the drivers/PROSet and restarting the system.
 - All the adapters specified as a group of Adapter Teaming must exist on the same LAN. If they are connected to the separate switches, they will not work normally.
 - The adapters specified as a group of Adaptive Load Balancing (ALB) can be connected to only Switching Hub.
 - When exchange the mother board or option network card, make sure to remove the adapter team before exchanges and recreate the adapter team after exchange complete.
 - Please confirm the port setting of switching hub (L2) matches the server network adapter Teaming mode.
 - If you want to change the type of a teaming, be sure to remove the teaming first, then re-setup a new teaming. Do not use the function of PROSet to change the type of a teaming.
-

Create Team

1. Open the [Device Manager].
2. Open [Network adapters] → [Intel(R) xxx] properties.
3. Click [Teaming] tab and check the [Team this adapter with other adapters] check box. Click [New Team].
4. Fill the name of the team in [Specify a name for the team] and click [Next].
5. Include the adapter to the team and click [Next].

6. Select a team mode, and then click [Next].

IMPORTANT: Following team types are supported

- Adapter Fault Tolerance
 - Adaptive Load Balancing
 - Static Link Aggregation
 - Switch Fault Tolerance
-

7. Click [Finish].
8. Click [TEAM: "Team name"] from [Device manager] → [Network adapters] to modify the team. Click [Settings] tab and click [Modify Team] button.
9. Refer to the following procedure to set the team member adapter priority status.
 - Set Primary
Point the adapter and click [Set Primary] button.
 - Set Secondary
Point the adapter and click [Set Secondary] button.

NOTE: Adapter priority config can be confirmed by the following procedure:

1. Click [TEAM: "Team name"] from [Device manager] → [Network adapters].
 2. Click [Settings] and confirm Adapters in team list.
-
10. Click [Test Switch] → [Run test] to confirm the adapter team is properly setup. Confirm the result in [Test results].
 11. Restart the system

Remove Team

1. Open the [Device Manager].
2. Click [Network adapters], and open [TEAM: "Team name"] properties.
3. Click [Setting] tab.
4. Click [Remove Team] button.
5. Click [Yes] to the message.
6. Confirm [TEAM: "Team name"] adapter is not existing in [Network adapters] tree and reboot the system.

LAN Board Driver (N8104-122/125A/126)

Install the driver stored in NEC EXPRESSBUILDER DVD.

Installation of the LAN Board Driver

1. Start Device Manager.
2. Click [Network adapters] and double-click [(Network Adapter Name)].
[(Network Adapter Name) Properties] appears.

NOTE: [(Intel (R) PRO/1000...)] is the name of On-Board adapter. All other names show the Optional Network Board.

3. Click [Driver] tab and click [Update Driver...]. [Hardware Update Wizard] appears.
4. Select the [Install from a list or specific location (Advanced)] radio button and click [Next].
5. Select the [Search for the best driver in these locations] radio button and uncheck the [Search removable media (floppy, CD-ROM...)] check box.
6. Check the [Include this location in the search] check box and when using [(122/125A/126)], specify [\\018\win\winnt\w2k3amd\r148\pro1000\winx64\ndis5x].
Then click [Next].
7. Click [Finish].
8. Restart the system

LAN Board Driver (N8104-123A)

To install the driver, refer to the installation manual provided with the board and according to the installation manual, use the driver stored in attached CD-ROM.

Graphics Accelerator Driver

If you utilize standard graphics accelerator drivers, update your system with NEC EXPRESSBUILDER DVD attached to your system.

Standard graphics accelerator drivers will be installed automatically.

Please follow the following procedure when you want to reinstall the driver individually.

1. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive.
If the autorun menu is displayed, close menu screen.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "install.bat" in the following directory.
\\018\win\winnt\w2k3amd\video
4. Follow the message to continue the installation.
If the dialog message "Digital Signature could not be found." appears, select [Yes] to continue.
5. Remove the NEC EXPRESSBUILDER DVD from the optical disk drive, restart the system.

Installing SCSI Controller Driver (N8103-107)

If you use the SCSI Controller N8103-107, update your system with NEC EXPRESSBUILDER DVD attached to your system.

The SCSI Controller driver will be installed automatically.

Installing SAS Controller Driver (N8103-104A)

If you use the SAS Controller N8103-104A, update your system with NEC EXPRESSBUILDER DVD attached to your system.

The SAS Controller driver will be installed automatically.

Installing RAID Controller Driver (N8103-135)

The installation procedure depends on your environment.

Follow steps below appropriate to your environment.

- If the RAID Controller (N8103-134) is used:
 - You do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.
- If the RAID Controller (N8103-134) is not used:
 - Update your system with NEC EXPRESSBUILDER DVD attached to your system.
 - The RAID Controller driver will be installed automatically.

About Windows Activation

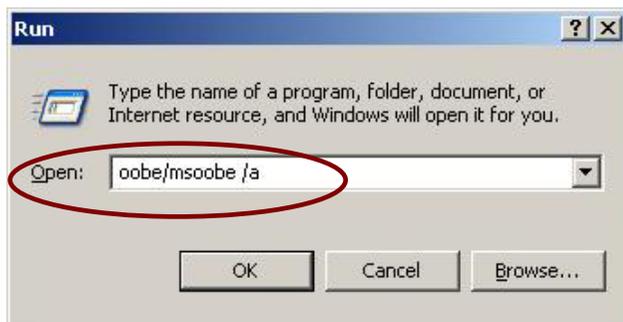
Windows Server 2003 x64 Editions must be activated before you can use Windows Server 2003 x64 Editions.

Windows activation process is as follows.

NOTE: When you use Windows Server 2003 R2 x64 Editions BackUp CD-ROM, activation process is not needed.

1. Click [Run] on [Start] menu.
Type as follows in the [Open:] box, and click [OK].

oobe/msoobe /a



2. When the screen as follows is displayed, click [Next].



The following screen is displayed.



3. Process "Windows activation" according to the following message.



SETTING FOR SOLVING PROBLEMS

Set for collecting memory dump using the procedure described in Chapter 5.

Appendix G

Installing Windows Server 2003

This section explains how to install the Windows Server 2003.

BEFORE INSTALLING WINDOWS SERVER 2003

Read the following notes or information before installing the Windows Server 2003.

Optional Board Supported by NEC EXPRESSBUILDER

The NEC EXPRESSBUILDER DVD attached to your server supports the following optional boards;

NOTE: If you want to install the other boards by using a driver floppy disk ("OEM-Disk for Mass storage device"), except ones listed below, see "Installing with the OEM-Disk for Mass storage device".

- Controllers supporting installation of OS with Express Setup
 - N8103-129 RAID Controller (256 MB, RAID0/1)*
 - N8103-130 RAID Controller (256 MB, RAID0/1/5/6)*
 - N8103-134 RAID Controller (512 MB, RAID0/1/5/6)*
 - Onboard RAID Controller (LSI Embedded MegaRAID™)
- Other controllers
 - N8103-104A SAS Controller*
 - N8103-107 SCSI Controller*
 - N8103-135 RAID Controller (512 MB, RAID0/1/5/6)*

* Option.

Service Pack Which NEC EXPRESSBUILDER Supports

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

- Windows Server 2003 R2
 - OS installation media (with Service Pack 2)
 - OS installation media (No Service Pack) + Service Pack 2
 - OS installation media (No Service Pack)

Application of Service Pack

You can install the Service Pack on the server. When the Service Pack is not attached to your system, prepare it by yourself.

When installing Windows Server 2003 R2, it is not necessary to apply Service Pack 1.

Connecting Hard Disk Drive

If you create multiple logical drives in your system, see "Re-installing the Operation System if Multiple Logical Drives Exist" (5-96).

Updating System

If you modified the Windows system, execute "Update Express5800 system" in the Autorun Menu.

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

If you want to leave the existing partition when installing the system on the hard disk upgraded to Dynamic Disk, note the following issue:

- Do not select the partition that OS had been installed as the partition to install the OS newly.
- Select "Use the current File System" for the format of OS partition.

About Removable Media

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

Floppy Disk Drive

The internal floppy disk drive is not included in your system at the standard configuration. Prepare the optional USB floppy disk drive or Flash FDD if necessary.

About the System 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	= 3500MB (Windows Server 2003 R2)
	= 3500MB (Windows Server 2003 R2 with Service Pack 2)
	= 5300MB (Windows Server 2003 R2 + Service Pack 2)
Paging File Size (Recommended)	= Mounted Memory Size * 1.5
Dump file Size	= Mounted Memory Size + 12MB
Application Size	= Required Size

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
 - The maximum paging file size which can be set on one partition is 4095MB. If the above paging file size exceeds 4095MB, specify 4095MB for the paging file size.
 - The maximum dump file size for the system with more than 2GB memory mounted is '2048MB + 12MB'.
 - If you install any application program or the like, add necessary space to the partition to install these programs.
-

For example, if the mounted memory size is 1GB (1,024MB), the partition size will be calculated by the above formula as follows:

$$3,500\text{MB} + (1,024\text{MB} * 1.5) + (1,024\text{MB} + 12\text{MB}) + \text{Application Size} \\ = 6,072\text{MB} + \text{Application Size}$$

Dividing into the partition of the recommended size into multiple disks as written below will solve problem that it cannot be reserved in one disk.

1. Set the "Size required for installation + Paging file size".
2. See Chapter 5 and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.
(If the disk does not have enough free space to enable the dump file size to be written, then after installing the system using the "Size required for installation + Paging file size", install an additional new disk.)

INSTALLING WINDOWS SERVER 2003

Preparations for Installation

- NEC EXPRESSBUILDER DVD
- Microsoft Windows Server 2003 R2 Standard Edition (CD-ROM) / Microsoft Windows Server 2003 R2 Enterprise Edition (CD-ROM)
- Windows Server 2003 Service Pack (CD-ROM)
- User's Guide
- Getting Started
- Windows Server 2003 OEM-Disk for EXPRESSBUILDER

Creating "Windows Server 2003 OEM-Disk for EXPRESSBUILDER"

Before installing, create Windows Server 2003 OEM-Disk for EXPRESSBUILDER.

NOTE: If you have already "Windows Server 2003 OEM-Disk for EXPRESSBUILDER" for NEC Express5800 Server which you are going to install Windows Server 2003, you do not need to create it again.

You can create Windows Server 2003 OEM-Disk for EXPRESSBUILDER with the following two procedures.

Create from the menu which appears when running NEC Express5800 Server with NEC EXPRESSBUILDER.

If you have only NEC Express5800 Server to create Windows Server 2003 OEM-Disk for EXPRESSBUILDER, use this procedure.

If Windows Server 2003 or Windows can be operated on NEC Express5800 Server, you can use the other procedure described later.

Follow the steps below.

1. Prepare one Flash FDD, or one USB floppy disk drive and 3.5-inch floppy disk.
2. Turn on your NEC Express5800 Server.
3. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive of the server.
4. Press the RESET switch or press **Ctrl, Alt** and **Delete** to reboot the server. (You may also turn off and then on again to reboot the server.)

The system will boot from the DVD-ROM and NEC EXPRESSBUILDER starts.

5. Select [Create the OEM-DISK for Windows] from [Tools Menu] step.

6. Connect the Flash FDD or the USB floppy disk drive. (If you use the floppy disk drive, insert a floppy disk into it.)
7. Select [Create an Windows Server 2003 OEM-Disk for EXPRESSBUILDER] at [Create OEM-Disk] and click [Perform].
8. Windows Server 2003 OEM-Disk for EXPRESSBUILDER will be created.
Write-protect and attach a label, then keep it safely.

IMPORTANT: If you have created "OEM-Disk" into the Flash FDD, disconnect it after the NEC EXPRESSBUILDER had been shutdown.

NOTE: If the following message is displayed, the floppy disk is write-protected.



Cancel write-protected state.

If you have already cancelled write-protected state, connect the floppy disk drive again.

Create from [Autorun Menu]

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

You can create Windows Server 2003 OEM-Disk for EXPRESSBUILDER from [Autorun Menu], if you have the computer on which the above operating systems operate.

Follow the steps below.

1. Prepare one Flash FDD, or one USB floppy disk drive and 3.5-inch floppy disk.
2. Start the Operating System.
3. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive of the server.

The Menu will appear.

4. Connect the Flash FDD or the USB floppy disk drive. (If you use the floppy disk drive, insert a floppy disk into it.)
5. Click [Create drive disk] and select [OEM-Disk for Windows Server 2003].

NOTE: You can do the same operation with the menu appeared by the Right-click.

6. Windows Server 2003 OEM-Disk for EXPRESSBUILDER will be created.
Write-protect and attach a label, then keep it safely.

Windows Server 2003 Clean Installation

This section explains how to perform a clean installation of Windows Server 2003.

IMPORTANT:

- If you have created the OEM-Disk into the Flash FDD, connect the Flash FDD before you start the system.
 - If you have created OEM-Disk into the floppy disk, connect the USB floppy disk drive before you start the system.
-

1. Turn on the system power.
2. Insert the Windows Server 2003 CD-ROM into the optical disk drive.
3. Press **Ctrl + Alt + Delete** to reset the system.

After a bootable operating system has been installed on the hard disk drive, press **Enter** while the message "Press any key to boot from CD..." is displayed at the top of the screen.

If no bootable operating system exists on the hard disk drive, this step is unnecessary.

The Windows Server 2003 setup screen will appear.

If the screen is not displayed, **Enter** was not pressed properly.

Begin after turning on the system power again.

4. If the RAID Controller/Option Controller is used, press **F6** in a few seconds when the window is in either of the following states.
 - "Setup is inspecting your computer's hardware configuration ..." or "Press F6 if you need to install a third party SCSI or RAID driver..." is displayed.
 - A screen with a solid blue background is displayed.

IMPORTANT:

- There is no visible indication on screen when F6 has been pressed.
 - If the RAID Controller/Option Controller is not used, you do not need to press **F6**, and go to Step 12.
-

5. The following message is displayed.

Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter. Currently, Setup will load support for the following mass storage devices.

<If the RAID Controller is used>
Press **S**, and go to Step 6.

<If the RAID Controller is not used>
Go to Step 8.

6. The following message is displayed.

Please insert the disk labeled
manufacturer-supplied hardware support disk
into Drive A:
*Press ENTER when ready.

If you use the floppy disk drive, insert the Windows Server 2003 OEM-Disk for EXPRESSBUILDER into the floppy disk drive, and press **Enter**.

NOTE: If you use the Flash FDD, the message above is not displayed.

A list of mass storage devices is displayed.

IMPORTANT: If you have created the OEM-Disk into the Flash FDD, connect the Flash FDD before you start the system.

7. Select the proper RAID Controller and press **Enter**.
- [LSI Embedded MegaRAID (Windows XP/2003 32-bit)]
(When Onboard RAID Controller (LSI Embedded MegaRAID™) is used.)
 - [LSI MegaRAID SAS RAID Controller Driver (Server 2003 32-bit)]
(When N8103-129/130 RAID Controller is installed.)
 - [Promise SuperTrak EX SAS 6G RAID Controller-32bits platform]
(When N8103-134 RAID Controller is installed.)

The screen of Step 5 is displayed.

8. <If the SCSI Controller N8103-107 is connected>
Press **S**.

IMPORTANT:

- Insert the Windows Server 2003 OEM-Disk for EXPRESSBUILDER into the floppy disk drive. If the floppy disk drive has already contained Windows Server 2003 OEM-Disk for EXPRESSBUILDER, you do not need to insert the Windows Server 2003 OEM-Disk for EXPRESSBUILDER.
 - If you have created the OEM-Disk into the Flash FDD, connect the Flash FDD before you start the system.
-

The screen of Step 6 is displayed. Press **Enter**, and go to Step 9.

<If the SCSI Controller N8103-107 is not connected>

Go to Step 10.

9. A list of mass storage devices is displayed.

Select the [Adaptec Ultra320 SCSI Cards (Windows 32-bit)] and press **Enter**.

IMPORTANT: If the following message is displayed when you use the N8103-107 SCSI controller, press **S**.

The driver you provided seems to be newer than the Windows default driver. Windows already has a driver that you can use for "Adaptec Ultra320 SCSI Cards (Windows 32-bit)". Unless the device manufacturer prefers that you use the driver on the floppy disk, you should use the driver in Windows.

The screen of Step 5 is displayed.

Go to Step 10.

10. <If the SAS Controller N8103-104A is connected>

Press **S**.

IMPORTANT:

- Insert the Windows Server 2003 OEM-Disk for EXPRESSBUILDER into the floppy disk drive. If the floppy disk drive has already contained Windows Server 2003 OEM-Disk for EXPRESSBUILDER, you do not need to insert the Windows Server 2003 OEM-Disk for EXPRESSBUILDER.
 - If you have created the OEM-Disk into the Flash FDD, connect the Flash FDD before you start the system.
-

The screen of Step 6 is displayed. Press **Enter**, and go to Step 11.

<If the SAS Controller N8103-104A is not connected>

Press **Enter**, and go to Step 12.

11. A list of mass storage devices is displayed.

Select the [LSI Fusion-MPT SAS Driver (Server 2003 32-bit)] and press **Enter**.

The screen of Step 5 is displayed.

Press **Enter**, and go to Step 12.

12. When the following message is shown, press **Enter** to start "Welcome to Setup".



IMPORTANT: If you install Windows Server 2003 on the hard disk larger than 2,097,152MB (2TB), you can specify only a value equal to or less than 2,097,152MB as partition size.

13. When the installation of Windows Server 2003 has finished, the system reboots automatically.
14. When Windows Server 2003 R2 has been installed, the [Windows Setup] screen will be displayed after logged on to the system.



IMPORTANT:

- In this case, the [Windows Setup] screen may not be displayed. Be sure to install Microsoft Windows Server 2003 R2 DISC 2 according to the following procedures.
 - You can install Microsoft Windows Server 2003 R2 DISC 2 after the application of "System update". Be sure to install Microsoft Windows Server 2003 R2 DISC 2. In this case, note that the [Windows Setup] screen is not displayed.
-

15. Insert Microsoft Windows Server 2003 R2 DISC 2 CD-ROM into the optical disk drive. Confirm the parameters and click [OK].
16. When the installation has completed, remove Microsoft Windows Server 2003 R2 DISC 2 CD-ROM from the optical disk drive, and restart the system.
17. When the installation has completed, be sure to execute the tasks described in "Driver Installation and Advanced Settings" and "Updating the System" of manual.

Procedure for License Authentication

Product Key used in the procedure for license authentication should be matched with the COA label in which the product key contained in Windows Server 2003 is written.

NOTES:

- Execute the activation within 30 days. System may be locked after 30 days is passed.
 - COA label may be attached to your server.
-

Updating the System - Applying Service Pack -

Update the system in the situation below:

- CPU is expanded (expanded to single processor to multi-processor).
- Modified system configuration.
- Recovered the system using recovery process.

The system update brings the correction program provided by Microsoft to be applied to reinforce the system security. The system update is recommended.

Service Pack 2 need not be applied again when Windows Server 2003 CD-ROM which Service Pack 2 is included is used and it is installed.

Go to the section of "Updating the System".

Perform "Updating the System" and application of the "Hotfix (KB921411)".

IMPORTANT: In the situation below, make sure to apply "Updating the System" and "Hotfix (KB921411)".

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

NOTE: If you use Windows Server 2003 CD-ROM which includes Service Pack 2, the application of "Hotfix (KB921411)" is not required.

Application Process of the Hotfix (KB921411)

Apply the "Hotfix (KB921411)" before execute "Updating the System".

1. Log on to the system by the account with administrator authority to the server (such as administrator).
2. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive of the server.
3. Click Start menu and [Run], and then execute the following command.

<When the English version of Windows Server 2003 R2 is used>

\\018\win\winnt\dotnet\qfe\enu\kb921411.exe

<When the Simplified Chinese version of Windows Server 2003 R2 is used>

\\018\win\winnt\dotnet\qfe\chs\kb921411.exe

<When the Traditional Chinese version of Windows Server 2003 R2 is used>

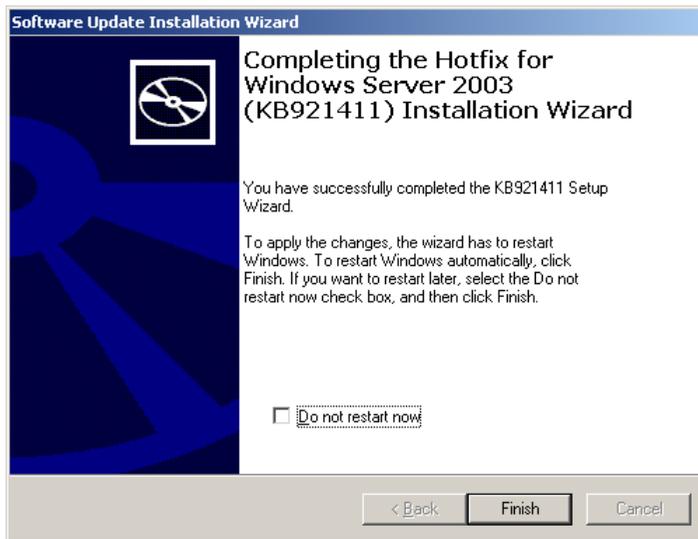
\\018\win\winnt\dotnet\qfe\cht\kb921411.exe

4. When the following message is displayed, click [Next].

After that, follow the message to continue the process.



5. When the following message is displayed, make sure to click [Finish] to restart the system.



With that, application process of the Hotfix (KB921411) is finished.

Application Process of "Updating the System"

"Updating the System" applies the drivers necessary for NEC Express5800 Series.

Follow this process after Hotfix for Windows Server 2003 (KB921411) had been applied.

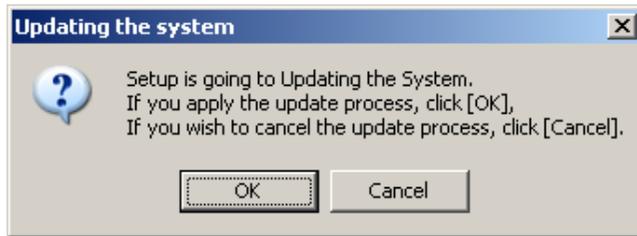
NOTE: If you install Windows CD-ROM that contains Service Pack 2 to your system, you do not have to apply Service pack 2 again.

1. Log on to the system with the account that has administrative privilege (e.g. administrator).
2. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive of server.
The Autorun Menu will be displayed
3. Left-click on [Setup Windows], and then click [Update the system].

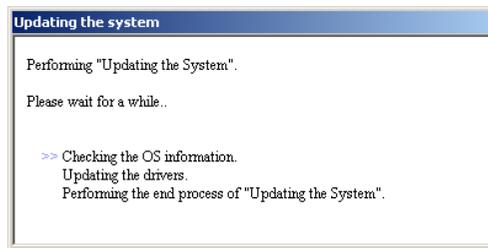
NOTE: Right-clicking on the Autorun Menu produces the same outcome.

4. Follow the message of the screen to proceed the application.

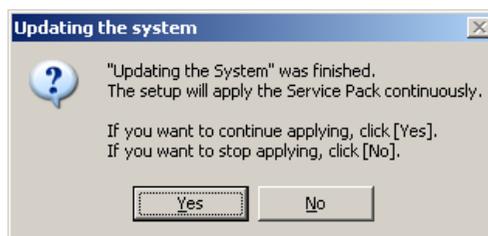
[OK] dialog box will be displayed.



NOTE: The following box appears during the update if you have deployed a full installation of Windows Server 2003. Wait until the update completes.



5. When the following message appears, "Updating the System" was finished.



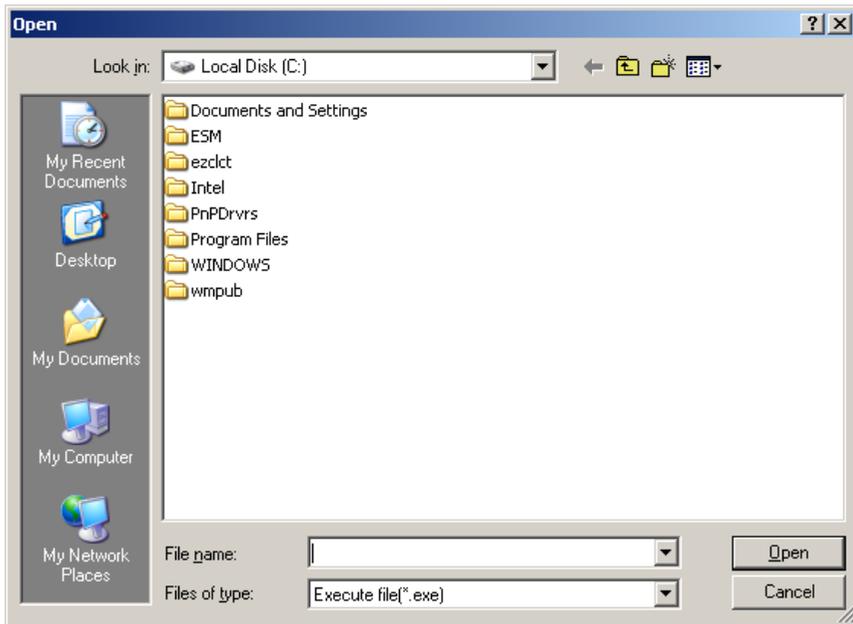
When you apply Service Pack: Click [Yes], and then go to Step 6.

When you don't apply Service Pack: Click [No], and then go to Step 8.

- When the following message appears, click [Yes].



- When the following message appears, select a Service Pack and click [Open] and then, according to a message, please apply it.



- When the following message appears, click [Yes] to restart the system.



The system has been updated.

Recovery Process

If "Updating the System" is executed before the application of the "Hotfix for Windows Server 2003 (KB921411)", "!" may be displayed on the USB root hub.

If "!" is displayed on the USB root hub, perform application of the "Hotfix for Windows Server 2003 (KB921411)" and the "Updating the System" according to the following process.

1. Start the Windows Explorer, and click [Tools] and [Folder Options].
2. Select [Files and Folders] - [Hidden files and folders] - [Show hidden files and folders] radio button from Advanced settings in the [View] tab.
3. Check off the following check box in the [Files and Folders] from Advanced settings in the [View] tab, and then click [OK].

Hide extensions for know file type

Hide protected operating system files [Recommended]

When the message "You have chosen to display protected operating system files..." is displayed, click [Yes].

4. Make sure of the files.

Open "<System drive:>\WINDOWS\system32\drivers" directory, and make sure usbhub.sys and usbport.sys are exists in the directory.

If you can not found them, copy the files according to the following process.

- (1) Open "<System drive:>\WINDOWS\system32\dllcache" directory.
- (2) Copy usbhub.sys and usbport.sys from the directory noted above to "<Systemdrive:>\WINDOWS\system32\drivers".

5. Restart the system.
6. Refer to [Application process of the Hotfix (KB921411)] and apply the "Hotfix for Windows Server 2003 (KB921411)".
7. Refer to [Application process of "Updating the System"] and execute "Updating the System".
8. Restart the system.

With that, process is finished.

DRIVER INSTALLATION AND ADVANCED SETTINGS

This section describes on how to install and setup various standard drivers mounted on the device.

For the information on installing and setting up the driver that is not described in this section, please refer to the document attached to the driver.

LAN Driver and PROSet

Please refer to Chapter 5 "Installing and Setting Device Drivers" for Windows Server 2003 to install and setup LAN driver and PROSet.

Graphics Accelerator Driver

If you utilize standard graphics accelerator drivers, update your system with NEC EXPRESSBUILDER DVD attached to your system.

Standard graphics accelerator drivers will be installed automatically.

Please follow the following procedure when you want to reinstall the driver individually.

1. Insert the NEC EXPRESSBUILDER DVD into the optical disk drive.
If the autorun menu is displayed, close menu screen.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "install.bat" in the following directory.
\\018\win\winnt\dotnet\video
4. Follow the message to continue the installation.
If the dialog message "Digital Signature could not be found." appears, select [Yes] to continue.
5. Remove the NEC EXPRESSBUILDER DVD from the optical disk drive, restart the system.

Installing SCSI Controller Driver (N8103-107)

If you use the SCSI Controller N8103-107, update your system with NEC EXPRESSBUILDER DVD attached to your system.

The SCSI Controller driver will be installed automatically.

Installing SAS Controller Driver (N8103-104A)

If you use the SAS Controller N8103-104A, update your system with NEC EXPRESSBUILDER DVD attached to your system.

The SAS Controller driver will be installed automatically.

Installing RAID Controller Driver (N8103-135)

The installation procedure depends on your environment.

Follow steps below appropriate to your environment.

- If the RAID Controller (N8103-134) is used:
 - You do not need to install the driver manually. It is automatically installed by Windows Plug-and-Play.
- If the RAID Controller (N8103-134) is not used:
 - Update your system with NEC EXPRESSBUILDER DVD attached to your system.
 - The RAID Controller driver will be installed automatically.

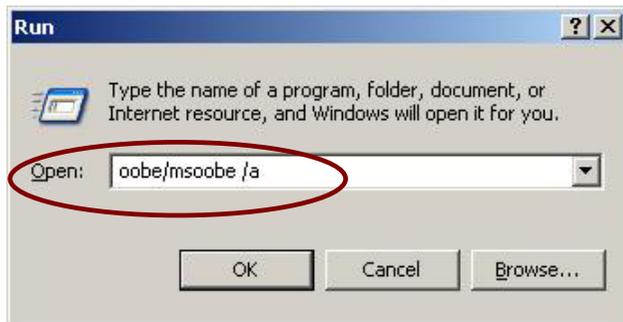
About Windows Activation

Windows Server 2003 must be activated before you can use Windows Server 2003.

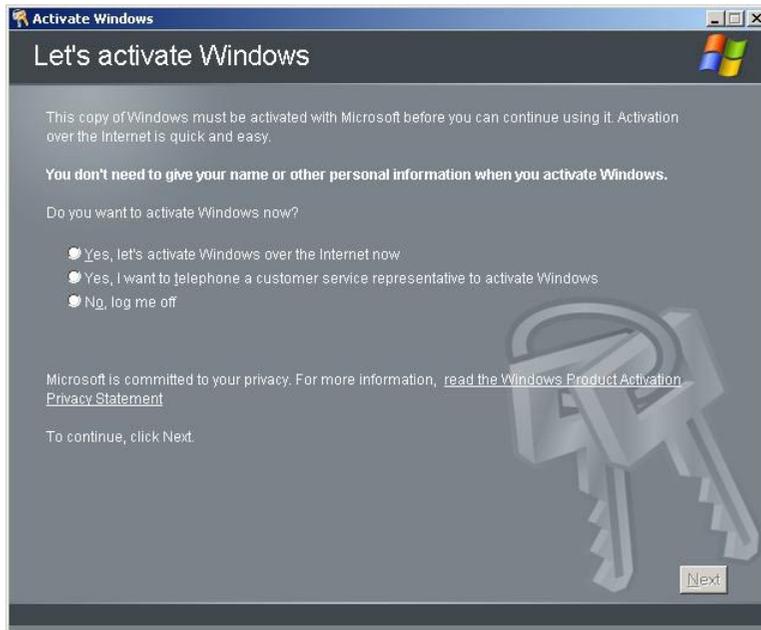
Windows activation process is as follows.

NOTE: When you use Windows Server 2003 R2 BackUp CD-ROM, activation process is not needed.

1. Click [Run] on [Start] menu.
Type as follows in the [Open:] box, and click [OK].
oobe/msoobe /a



2. When the screen as follows is displayed, click [Next].



The following screen is displayed.



3. Process "Windows activation" according to the following message.



The procedure to set PAE option

If your 32-bit system has a memory capacity in excess of 4GB, setting PAE option will enable the system to be installed with over 4GB of memory.

IMPORTANT: However, the Microsoft operating system products which support /PAE switch option are limited.

Refer to the following article in Microsoft Knowledge Base to check the supported products.

Microsoft Knowledge Base - Article ID: 291988
"A description of the 4GB RAM tuning feature and the Physical Address Extension switch"

In Windows Server 2003 system, the PAE option can be set by editing boot.ini.

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

1. Click [Start], point to [Settings], and then click [Control Panel].
2. In [Control Panel], double-click [System].
[System Properties] dialog box will be shown.
3. Click the [Advanced] tab, and then click [Settings] under [Setup and Recovery].
4. Under [System Setup], click [Edit] to open [Boot.ini].
5. Add "/PAE" to [Operating Systems] section in [Boot.ini] file, and then save it.

<Example of Boot.ini file>

```
[boot loader]
timeout=30
default=multi(0)disk(0)rdisk(0)partition(2)\WINDOWS
[operating systems]
multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003"
/fastdetect
multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003, PAE" /fastdetect
/PAE
C:\CMDCONS\BOOTSECT.DAT="Microsoft Windows Recovery Console " /cmdcons
```

This is the end of editing Boot.ini file.

NOTE: If you choose one of the items in the "Default operating system" drop-down list box in [Setup and Recovery] group box, you can make your system start automatically from the switch you specified.

SETTING FOR SOLVING PROBLEMS

Set for collecting memory dump using the procedure described in Chapter 5.

Appendix H

Using a Client Computer Which Has a CD Drive

The NEC EXPRESSBUILDER disk is DVD so that a client computer which you want to use for managing the server needs a DVD drive.

If you want to install the management software of EXPRESSBUILDER to the client without the DVD drive, make a CD-R from EXPRESSBUILDER DVD according to the following steps.

NOTE: This procedure can copy only one CD at the purpose of installing the management software to the client.

1. Insert the EXPRESSBUILDER DVD to the computer which has a DVD drive.
2. If Autorun menu appears, close the menu.
3. Copy the below files of EXPRESSBUILDER to a hard disk by using Explorer.

```
\(root folder) : copy version.xml
|
|018
|  |-- \ar_menu : copy this sub-folder
|  |-- \doc : copy this sub-folder
|  |-- \win : copy this sub-folder
```

4. Delete the ar_menu\autorun_menu.xml on the hard disk, and rename the ar_menu\autorun_en.xml on the hard disk to the autorun_menu.xml.
5. Copy the above files/folders to a CD-R.
Match the root folder when you burn a CD-R.
6. Delete the files/folders that you copied at step 3.
7. Insert the CD-R to a client computer which you want to install the management software.
8. Kick the below file of the CD-R by using Explorer.

```
\018\ar_menu\autorun_menu.exe    (for Windows 32 bit edition)
autorun_menu_x64.exe             (for Windows 64 bit edition)
```

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Appendix I

Accessing Power and Performance Data

This chapter describes how to collect the power and performance data, including power consumption, inlet air temperature, and processor utilization of NEC Express server in usual operation. These are defined in ENERGY STAR® Program Requirements for Computer Servers and must be available to users.

The sample program shown below is verified to be run normally on Windows Server® 2008 Enterprise 32bit (x86) Edition.

POWER CONSUMPTION

Run the following commands to access power consumption readings on BMC (Baseboard Management Controller) via IPMI (Intelligent Platform Management Interface).

Network Function Code: 3Eh (Controller-specific OEM)

Command Code: 0Bh (Get Current Sensor Data)

Shown below is a sample file created by Visual Basic Script (e.g. Power.vbs).

```
' Start script
Option Explicit

' Prepare for IPMI Driver
Dim osv, oclass
Dim oinstance, oipmi
set osv = getobject("winmgmts:root\wmi")
set oclass = osv.get("microsoft_ipmi")
for each oinstance in osv.instancesof("microsoft_ipmi")
    set oipmi = oinstance
next

'Format the IPMI command request
Dim oinparams
set oinparams = oclass.methods_("requestresponse").inparameters
oinparams.networkfunction = &h3e ' OEM NetworkFunction
oinparams.lun = 0
oinparams.responderaddress = &h20
oinparams.command = &h0b ' Get Current Sensor Data Command
oinparams.requestdatasize = 0
```

```
'call the driver
Dim outparams
set outparams = oipmi.execmethod_("requestresponse",oinparams)

WScript.Echo " Completion Code = 0x" & hex(outparams.Completioncode)
If outparams.Completioncode <> 0 Then
    WScript.Echo " Not supported"
Else
    'WScript.Echo " Data LS Byte      = 0x" & hex(outparams.ResponseData(1))
    'WScript.Echo " Data MS Byte      = 0x" & hex(outparams.ResponseData(2))
    WScript.Echo " Power Consumption = " & outparams.ResponseData(2)*256 + _
        outparams.ResponseData(1) & " watts"
End If
' End Script
```

Command Line (Example)

```
C:\VBS> cscript //nologo Power.vbs
```

Execution Result (Example)

```
Completion Code = 0x0
Power Consumption = 528 watts
```

The power consumption is 528 watts.

NOTE: Power consumption may not be collected depending on power supply configuration of the server. In such a case, Completion Code is shown as 0xC1 or 0xCB.

INLET AIR TEMPERATURE

Run the following IPMI commands to access the SDR (Sensor Data Record) and obtain an inlet air temperature data.

Get SDR Repository Info

Reserve SDR Repository

Get SDR

Get Sensor Reading

Shown below is an example of the file created by Visual Basic Script (e.g. Sensor.vbs).

```
'start script
Option Explicit

' Prepare for MS IPMI Driver
Dim osv, oclass
Dim oinstance, oipmi
set osv = getobject("winmgmts:root\wmi")
set oclass = osv.get("microsoft_ipmi")
for each oinstance in osv.instancesof("microsoft_ipmi")
    set oipmi = oinstance
next

' (Get SDR Repository Info)
Dim oinparams
set oinparams = oclass.methods_("requestresponse").inparameters
' (Get SDR Repository Info)
oinparams.networkfunction = &h1
oinparams.lun = 0
oinparams.responderaddress = &h20
oinparams.command = &h20
oinparams.requestdatasize = 0
' Fire IPMI Command
Dim outparams
Dim i, RecordCount
set outparams = oipmi.execmethod_("requestresponse",oinparams)
RecordCount = outparams.ResponseData(3)*256 + outparams.ResponseData(2)

' (Reserve SDR Repository)
oinparams.networkfunction = &h1
oinparams.lun = 0
oinparams.responderaddress = &h20
oinparams.command = &h22
oinparams.requestdatasize = 0
Dim Reserve_LS, Reserve_MS
set outparams = oipmi.execmethod_("requestresponse",oinparams)
Reserve_LS = outparams.ResponseData(1)
Reserve_MS = outparams.ResponseData(2)
```

```
' (Get SDR) for each record
Dim Record_LS,Record_MS, Offset, Length
Dim cnt, sensorNum, sensorType
' First Record
Record_LS = 0
Record_MS = 0
For cnt = 0 to RecordCount-1
    Offset = 0
    Length = 9
    oinparams.networkfunction = &ha
    oinparams.lun = 0
    oinparams.responderaddress = &h20
    oinparams.command = &h23
    oinparams.requestdata = array(Reserve_LS, Reserve_MS, Record_LS, Record_M
s, Offset, Length)
    oinparams.requestdatasize = 6
    set outparams = oipmi.execmethod_("requestresponse",oinparams)
    If outparams.Completioncode = 0 Then
        If outparams.ResponseData(6) = 1 Then ' Full Sensor Record
            call GetSensorType(Reserve_LS, Reserve_MS, Record_LS, Record_MS,
sensorType)
            If sensorType = 1 Then ' Temperature
                WScript.Echo "====="
                call GetIDString(Reserve_LS, Reserve_MS, Record_LS, Record_MS
)
                WScript.Echo " Sensor Type = Temperature"
                sensorNum = outparams.ResponseData(10)
                call GetSensor(Reserve_LS, Reserve_MS, Record_LS, Record_MS,s
ensorNum)
            End If
        End If
        Record_LS = outparams.ResponseData(1)
        Record_MS = outparams.ResponseData(2)
        If Record_LS = &hff And Record_MS = &hff Then
            exit For
        End If
    End If
Next

Sub GetSensorType(rv_ls, rv_ms, rc_ls, rc_ms, sensorType)
    Dim outtmp
    oinparams.networkfunction = &ha
    oinparams.lun = 0
    oinparams.responderaddress = &h20
    oinparams.command = &h23
    oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 12, 2)
    oinparams.requestdatasize = 6
    set outtmp = oipmi.execmethod_("requestresponse",oinparams)
    sensorType = outtmp.ResponseData(3)
End Sub
```

```

Sub GetSensor(rv_ls, rv_ms, rc_ls, rc_ms, sensorNum)
  Dim outtmp, units1, units2, sensortype
  oinparams.networkfunction = &h4
  oinparams.lun = 0
  oinparams.responderaddress = &h20
  oinparams.command = &h23
  oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 20, 14)
  oinparams.requestdatasize = 6
  set outtmp = oipmi.execmethod_("requestresponse",oinparams)

  units1 = outtmp.ResponseData(3)
  Select Case outtmp.ResponseData(4)
    case 0: units2 = "unspecified"
    case 1: units2 = "degrees c"
    case 6: units2 = "watts"
    case else: units2 = "Refer to IPMI Specification: Type=0x" _
      & hex(outtmp.ResponseData(4))
  End Select

  ' (Get Sendor Reading)
  Dim sensorData, rawData, currentValue
  oinparams.networkfunction = &h4
  oinparams.lun = 0
  oinparams.responderaddress = &h20
  oinparams.command = &h2d
  oinparams.requestdata = array(sensorNum)
  oinparams.requestdatasize = 1
  set sensorData = oipmi.execmethod_("requestresponse",oinparams)
  If sensorData.Completioncode <> 0 Then
    'WScript.Echo " Sensor Not Available"
    exit Sub
  End If
  rawData = sensorData.ResponseData(1)
  If units1 and &h40 Then
    If rawData And &h80 Then
      rawData = rawData Xor &hff
    End If
  ElseIf units1 and &h80 Then
    call get2complement(rawData, rawData, 8)
  End If
  If (sensorData.ResponseData(2) And &h80) = 0 Or _
    (sensorData.ResponseData(2) And &h40) = 0 Or _
    (sensorData.ResponseData(2) And &h20) Then
    WScript.Echo " Event Status: Unavailable"
  Else
    'WScript.Echo " Event Status: ok"
    Dim M,B,k1,k2
    Dim ret
    M = (outtmp.ResponseData(8) And &hc0) * 4 + outtmp.ResponseData(7)
    B = (outtmp.ResponseData(10) And &hc0) * 4 + outtmp.ResponseData(9)
    call get2complement(M, M, 10)
    call get2complement(B, B, 10)
    call get2complement(outtmp.ResponseData(12) And &h0f, k1, 4)
    call get2complement((outtmp.ResponseData(12) And &hf0)/16, k2, 4)
    currentValue = Cdbl (((M * rawData) + (B * (10 ^ k1))) * (10 ^ k2))
    WScript.Echo " Current Value = " & currentValue & " " & units2
  End If
End Sub

```

```
Sub get2complement(raw, rv, bit)
  Select Case bit
    case 4:
      If raw And &h8 Then
        rv = 0 - ((&h10 - raw) and &h0f)
      Else
        rv = raw
      End If
    case 8:
      If raw And &h80 Then
        rv = 0 - ((&h100 - raw) and &h0ff)
      Else
        rv = raw
      End If
    case 10:
      If raw And &h200 Then
        rv = 0 - ((&h400 - raw) and &h3ff)
      Else
        rv = raw
      End If
  End Select
End Sub

Sub GetIDString(rv_ls, rv_ms, rc_ls, rc_ms)
  Dim tmpMessage
  Dim outsdridstringtype
  oinparams.networkfunction = &ha
  oinparams.lun = 0
  oinparams.responderaddress = &h20
  oinparams.command = &h23
  oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 47, 1)
  oinparams.requestdatasize = 6
  set outsdridstringtype = oipmi.execmethod_("requestresponse",oinparams)

  Dim outsdridstring
  Dim idlength, j
  idlength = outsdridstringtype.ResponseData(3) and 31
  oinparams.networkfunction = &ha
  oinparams.lun = 0
  oinparams.responderaddress = &h20
  oinparams.command = &h23
  oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 48, idlength)
  oinparams.requestdatasize = 6
  set outsdridstring = oipmi.execmethod_("requestresponse",oinparams)
  tmpMessage = " ID String = "
  For j = 3 to idlength + 2
    tmpMessage = tmpMessage & Chr(outsdridstring.ResponseData(j))
  Next
  WScript.Echo tmpMessage
End Sub
'End Script
```

Command Line (Example)

```
C:\VBS> cscript //nologo Sensor.vbs
```

Execution Result (Example)

```
=====
ID String = Front Panel Temp
Sensor Type = Temperature
Current Value = 27 degrees C
=====
ID String = Baseboard Temp1
Sensor Type = Temperature
Current Value = 50 degrees C
=====
ID String = Baseboard Temp2
Sensor Type = Temperature
Current Value = 53 degrees C
=====
ID String = IO Riser Temp
Sensor Type = Temperature
Current Value = 43 degrees C
=====
ID String = M1 DIMM 1A Temp
Sensor Type = Temperature
Current Value = 37 degrees C
=====
:
:
```

Inlet air temperature data is obtained from the sensor that contains the character string "Amb", "Ambient", or "Front Panel" in its ID String.

In the example above, the data is obtained from "Front Panel Temp" sensor, and the sensor reading is 27°C.

PROCESSOR UTILIZATION

To collect the utilization of processors, use Win32_PerfFormattedData_PerfOS_Processor class provided with the Windows OS.

Shown below is a sample file created by Visual Basic Script (e.g. Proc.vbs).

In this script, the processor utilization is collected every 30 seconds.

```
' Start Script
strComputer = "."
Set objWMIService = GetObject("winmgmts:"
    & "{impersonationLevel=impersonate}!\\.\\" & strComputer & "\root\cimv2")
set objRefresher = CreateObject("wbemScripting.Swbemrefresher")
Set objProcessor = objRefresher.AddEnum _
    (objWMIService, "win32_PerfFormattedData_PerfOS_Processor").objectSet
objRefresher.Refresh
Dim first
first = true
Do
    For each intProcessorUse in objProcessor
        If first Then
            If intProcessorUse.Name = "_Total" Then
                first = false
            End If
        else
            Wscript.Echo "Proc" & intProcessorUse.Name & " : " & _
                "PercentProcessorTime=" & _
                intProcessorUse.PercentProcessorTime
        End If
    Next
    Wscript.Sleep 30*1000    'sleep 30 * 1000ms
    objRefresher.Refresh
Loop
' End Script
```

Command Line (Example)

```
C:\VBS> cscript //nologo Proc.vbs
```

Execution Result (Example)

```
Proc0 : PercentProcessorTime=9
Proc1 : PercentProcessorTime=0
Proc2 : PercentProcessorTime=0
Proc3 : PercentProcessorTime=0
Proc4 : PercentProcessorTime=0
Proc5 : PercentProcessorTime=1
Proc6 : PercentProcessorTime=6
Proc7 : PercentProcessorTime=41
Proc8 : PercentProcessorTime=0
Proc9 : PercentProcessorTime=0
Proc10 : PercentProcessorTime=0
Proc11 : PercentProcessorTime=0
Proc12 : PercentProcessorTime=0
Proc13 : PercentProcessorTime=7
Proc14 : PercentProcessorTime=20
Proc15 : PercentProcessorTime=63
  :
  :
Proc_Total : PercentProcessorTime=8
```

Proc0 to Proc64 represents utilization of individual processor, and Proc_Total represents utilization of overall processors.

NOTE: The processor number indicates a logical CPU number, not a physical CPU number. The maximum processor number depends on processor type and how they are configured.

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Appendix J

Product Configuration Record Table

Use this table for information about setup and system environment change.

Hardware

Main Unit						
	Model name		Serial No.		Date Installed	
Processor						
#1	Clock		Serial No.		Date Installed	
#2	Clock		Serial No.		Date Installed	
#3	Clock		Serial No.		Date Installed	
#4	Clock		Serial No.		Date Installed	
Memory Backboard 1						
Slot 1A	Size		Serial No.		Date Installed	
Slot 2A	Size		Serial No.		Date Installed	
Slot 1B	Size		Serial No.		Date Installed	
Slot 2B	Size		Serial No.		Date Installed	
Slot 1C	Size		Serial No.		Date Installed	
Slot 2C	Size		Serial No.		Date Installed	
Slot 1D	Size		Serial No.		Date Installed	
Slot 2D	Size		Serial No.		Date Installed	
Memory Backboard 2						
Slot 1A	Size		Serial No.		Date Installed	
Slot 2A	Size		Serial No.		Date Installed	
Slot 1B	Size		Serial No.		Date Installed	
Slot 2B	Size		Serial No.		Date Installed	
Slot 1C	Size		Serial No.		Date Installed	
Slot 2C	Size		Serial No.		Date Installed	
Slot 1D	Size		Serial No.		Date Installed	
Slot 2D	Size		Serial No.		Date Installed	
Memory Backboard 3						
Slot 1A	Size		Serial No.		Date Installed	
Slot 2A	Size		Serial No.		Date Installed	
Slot 1B	Size		Serial No.		Date Installed	
Slot 2B	Size		Serial No.		Date Installed	
Slot 1C	Size		Serial No.		Date Installed	
Slot 2C	Size		Serial No.		Date Installed	
Slot 1D	Size		Serial No.		Date Installed	
Slot 2D	Size		Serial No.		Date Installed	

J-2 Product Configuration Record Table

Memory Backboard 4						
Slot 1A	Size		Serial No.		Date Installed	
Slot 2A	Size		Serial No.		Date Installed	
Slot 1B	Size		Serial No.		Date Installed	
Slot 2B	Size		Serial No.		Date Installed	
Slot 1C	Size		Serial No.		Date Installed	
Slot 2C	Size		Serial No.		Date Installed	
Slot 1D	Size		Serial No.		Date Installed	
Slot 2D	Size		Serial No.		Date Installed	
Memory Backboard 5						
Slot 1A	Size		Serial No.		Date Installed	
Slot 2A	Size		Serial No.		Date Installed	
Slot 1B	Size		Serial No.		Date Installed	
Slot 2B	Size		Serial No.		Date Installed	
Slot 1C	Size		Serial No.		Date Installed	
Slot 2C	Size		Serial No.		Date Installed	
Slot 1D	Size		Serial No.		Date Installed	
Slot 2D	Size		Serial No.		Date Installed	
Memory Backboard 6						
Slot 1A	Size		Serial No.		Date Installed	
Slot 2A	Size		Serial No.		Date Installed	
Slot 1B	Size		Serial No.		Date Installed	
Slot 2B	Size		Serial No.		Date Installed	
Slot 1C	Size		Serial No.		Date Installed	
Slot 2C	Size		Serial No.		Date Installed	
Slot 1D	Size		Serial No.		Date Installed	
Slot 2D	Size		Serial No.		Date Installed	
Memory Backboard 7						
Slot 1A	Size		Serial No.		Date Installed	
Slot 2A	Size		Serial No.		Date Installed	
Slot 1B	Size		Serial No.		Date Installed	
Slot 2B	Size		Serial No.		Date Installed	
Slot 1C	Size		Serial No.		Date Installed	
Slot 2C	Size		Serial No.		Date Installed	
Slot 1D	Size		Serial No.		Date Installed	
Slot 2D	Size		Serial No.		Date Installed	
Memory Backboard 8						
Slot 1A	Size		Serial No.		Date Installed	
Slot 2A	Size		Serial No.		Date Installed	
Slot 1B	Size		Serial No.		Date Installed	
Slot 2B	Size		Serial No.		Date Installed	
Slot 1C	Size		Serial No.		Date Installed	
Slot 2C	Size		Serial No.		Date Installed	
Slot 1D	Size		Serial No.		Date Installed	
Slot 2D	Size		Serial No.		Date Installed	

Hard Disk Drive						
Slot 0	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Slot 1	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Slot 2	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Slot 3	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Slot 4	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Slot 5	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Slot 6	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Slot 7	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Backup Device						
Slot 1 (Optional)	Size		Capacity		Serial No.	
	Model name		Type number		Date Installed	
PCI Slot #1						
	Model name				Serial No.	
					Date Installed	
PCI Slot #2						
	Model name				Serial No.	
					Date Installed	
PCI Slot #3						
	Model name				Serial No.	
					Date Installed	
PCI Slot #4						
	Model name				Serial No.	
					Date Installed	
PCI Slot #5						
	Model name				Serial No.	
					Date Installed	
PCI Slot #6						
	Model name				Serial No.	
					Date Installed	
PCI Slot #7						
	Model name				Serial No.	
					Date Installed	

J-4 Product Configuration Record Table

PCI Slot #8						
	Model name				Serial No.	
					Date Installed	
PCI Slot #9						
	Model name				Serial No.	
					Date Installed	
PCI Slot #10						
	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	
Display						
	Model name				Serial No.	
	Manufacturer				Date Installed	
Keyboard						
	Model name				Serial No.	
	Manufacturer				Date Installed	
Mouse						
	Model name				Serial No.	
	Manufacturer				Date Installed	

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