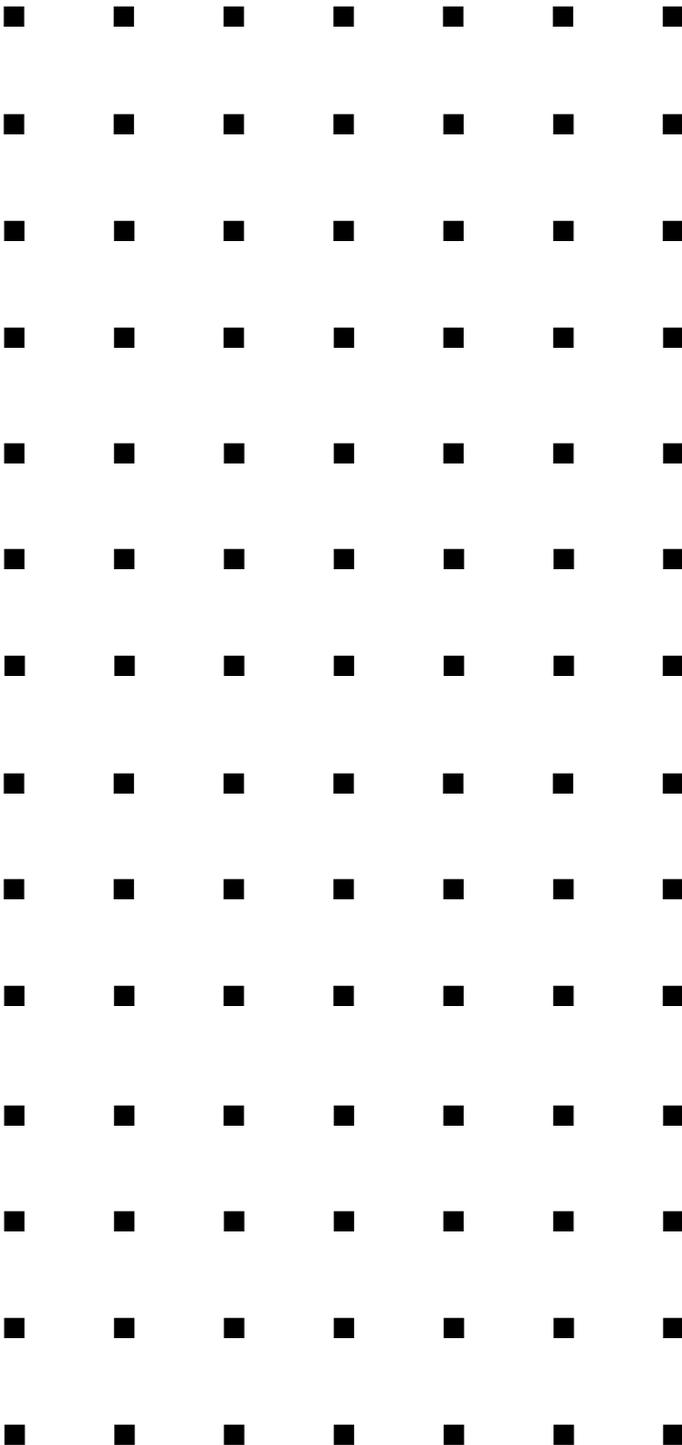


**NovaScale R480 E1**



**User Guide**

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Keep this User's Guide at hand for quick reference at anytime necessary.

## SAFETY INDICATIONS

Follow the instructions in this User's Guide for your safety to use the server.

The server contains components with possible danger and hazards that may caused by ignoring warnings. Preventive actions can be taken against such hazards.

Server components potentially dangerous are indicated with a warning label placed on or around them, and described in this User's Guide.

In the User's Guide or warning labels, "WARNING" or "CAUTION" is used to indicate a degree of danger. These terms are defined as follows:

 <b>WARNING</b>	Indicates the presence of a hazard that may result in death or serious personal injury.
 <b>CAUTION</b>	Indicates the presence of a hazard that may cause minor personal injury, including burns, or property damage.

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

High temperature.  
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.

Description of a danger

# SYMBOLS USED IN THIS USER'S GUIDE AND WARNING LABELS

## Attentions

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

## Prohibited Actions

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

## Mandatory Action

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

## SAFETY INDICATIONS BY COLOR OF THE PARTS

Only green areas are available for hot swap or hot plug operation. To avoid electric shock, disconnect all AC cords before accessing to other parts especially blue area inside the system.

**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



CLASS 1  
LASER PRODUCT

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

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Windows Vista stands for Microsoft® Windows Vista® Business operating system. Windows Server 2003 x64 Editions stands for Microsoft® Windows® Server 2003 R2, Standard x64 Edition Operating system and Microsoft® Windows® Server 2003 R2, Enterprise x64 Edition operating system, or Microsoft® Windows® Server 2003, Standard x64 Edition operating system and Microsoft® Windows® Server 2003, Enterprise x64 Edition operating system. Windows Server 2003 stands for Microsoft® Windows® Server 2003 R2, Standard Edition operating system and Microsoft® Windows® Server 2003 R2, Enterprise Edition operating system, or Microsoft® Windows® Server 2003, Standard Edition operating system and Microsoft® Windows® Server 2003, Enterprise Edition operating system. Windows XP x64 Edition stands for Microsoft® Windows® XP Professional x64 Edition operating system. Windows XP stands for Microsoft® Windows® XP Home Edition operating system and Microsoft® Windows® XP Professional operating system. Windows 2000 stands for Microsoft® Windows® 2000 Server operating system and Microsoft® Windows® 2000 Advanced Server operating system, and Microsoft® Windows® 2000 Professional operating system. Windows NT stands for Microsoft® Windows NT® Server network operating system version 3.51/4.0 and Microsoft® Windows NT® Workstation operating system version 3.51/4.0. Windows Me stands for Microsoft® Windows® Millennium Edition operating system. Windows 98 stands for Microsoft® Windows®98 operating system. Windows 95 stands for Microsoft® Windows®95 operating system. WinPE stands for Microsoft® Windows® Preinstallation Environment.

## Momentary voltage drop prevention:

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

## Notes:

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## **PREFACE**

Welcome to the NovaScale R480 E1 server.

The NovaScale R480 E1 server holds powerful performance and employs the latest technology to implement a computer for the next generation. With its potential capabilities, the server may be used as the workstation PC that configures a client-server system and provides high-speed processing and superior reliability.

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

## 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 help you find the information quickly, this User's Guide contains the following information:

#### **Chapter 1 Notes on Using Your Server**

includes information that requires attention when using the server. Make sure to read this chapter before setting up and using the server.

#### **Chapter 2 General Description**

includes information necessary to use the server, such as names and functions of its components, handling of the floppy disk and CD-RW/DVD-ROM drives. It also includes requirements and advisory information for transfer and disposal of the server.

#### **Chapter 3 Setting Up Your Server**

tells you how to select a site, unpack the system, assemble the rack-mount subsystem, make the 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 the SAS devices in your system. This chapter also provides information on the base board and I/O riser 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 information on using the attached "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 and I/O Port Address**

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

### **Appendix D Installing Windows Server 2003 x64 Editions**

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

### **Appendix E Installing Windows Server 2003**

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

### **Appendix F 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 that any component is 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 the server, as well as to set it up.
- Make a backup copy of each provided floppy disk, if any. Store the original disk as the master disk in a designated place, and use its copy.
- Improper use of any provided floppy disk or DVD-ROM may alter your system environment. If you find anything unclear, immediately ask your service representative for help.

# Chapter 1

---

## Notes on Using Your Server

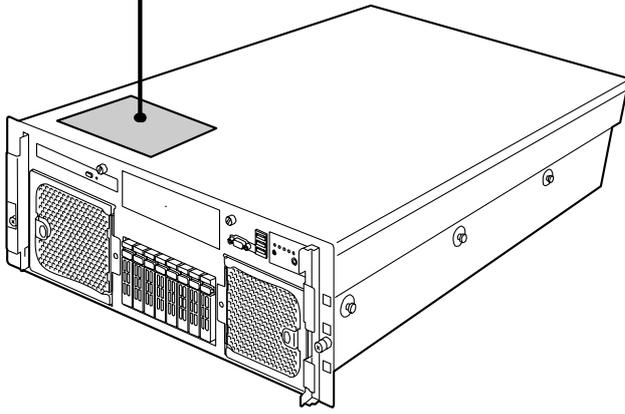
This chapter includes the information necessary for the proper and safe operation of your server.

# WARNING LABELS

A warning label is attached to the potentially dangerous components 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.

<p><b>注意 CAUTION</b></p>	<p><b>重量物注意 注意重物 WARNING: HEAVY ITEM</b></p>
<p>オプションの取付け、取外し時はすべての電源プラグをコンセントから抜き、外部装置と接続しているケーブルを外して下さい。 进行可选项的安装和拆卸时，请先把电源插头从插座中拔出，并取下与外部设备连接着的线缆。 Disconnect all AC power cords from both system and external peripherals prior to installing/removing options.</p>	<p>電源プラグを抜く 或下電將插头 電源注意 有触电危险</p>
<p>ネジは本機内部へ落とさない様、十分ご注意ください。 Do not drop any screws inside the system.</p>	<p>ざっくり落とす事故防止のため移動のさいは3人以上で行って下さい。 为了防止搬运受损以及物体失手落下，移动设备时请一定由3人以上进行。 To avoid the risk of personal injury or damage to the unit, move the unit with at least three or more people.</p>
<p>ボード及びオプション機能の接続の際は、必ずユーザーズガイドを参照し、正しく接続して下さい。 誤った接続は、故障や火災の原因となります。 对客户以及可选项设备进行连接时，请务必参照“用户指南”正确进行连接。如果错误连接，可能会导致故障或火灾的发生。 Refer to the "User's Guide" when option boards or peripherals are installed. Incorrect installations may result in damage to the system and lead to accidents.</p>	<p>必ずユーザーズガイドを参照し、正しく接続して下さい。 对客户以及可选项设备进行连接时，请务必参照“用户指南”正确进行连接。如果错误连接，可能会导致故障或火灾的发生。 Refer to the "User's Guide" when option boards or peripherals are installed. Incorrect installations may result in damage to the system and lead to accidents.</p>
<p>装置の持ち上げ、移動の際は、装置の底面をしっかりと持ち上げて下さい。 抬起或移动设备时，请注意托举设备底部。 Firmly hold the bottom of the system when required to lift and carry the system.</p>	<p>必ずユーザーズガイドを参照し、正しく接続して下さい。 对客户以及可选项设备进行连接时，请务必参照“用户指南”正确进行连接。如果错误连接，可能会导致故障或火灾的发生。 Refer to the "User's Guide" when option boards or peripherals are installed. Incorrect installations may result in damage to the system and lead to accidents.</p>
<p>グリーンで色分けされているデバイスやスロットは、システム運用中にホットスワップで交換および追加が可能です。 有绿色标记的装置或插槽可在系统运行中进行热交换及热追加。 Only green area is available for Hot Swap or Hot Plug operation. To avoid electric shock, disconnect all AC cords before accessing to others inside the system.</p>	<p>必ずユーザーズガイドを参照し、正しく接続して下さい。 对客户以及可选项设备进行连接时，请务必参照“用户指南”正确进行连接。如果错误连接，可能会导致故障或火灾的发生。 Refer to the "User's Guide" when option boards or peripherals are installed. Incorrect installations may result in damage to the system and lead to accidents.</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。保守をするまえに各々のコンポーネントの取り扱い説明書をお読みください。 有的部件即使在断电后仍会使用电池供电在运转。进行设备维护前，请务必阅读各部件相关的说明书。 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>必ずユーザーズガイドを参照し、正しく接続して下さい。 对客户以及可选项设备进行连接时，请务必参照“用户指南”正确进行连接。如果错误连接，可能会导致故障或火灾的发生。 Refer to the "User's Guide" when option boards or peripherals are installed. Incorrect installations may result in damage to the system and lead to accidents.</p>
<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ください。 有的部件可能会达到高温。请注意待其冷却之后再接触。 As some components may become very hot during system operation, give ample time to cool down as well as use precaution when handling internal components immediately after powering down.</p>	<p>必ずユーザーズガイドを参照し、正しく接続して下さい。 对客户以及可选项设备进行连接时，请务必参照“用户指南”正确进行连接。如果错误连接，可能会导致故障或火灾的发生。 Refer to the "User's Guide" when option boards or peripherals are installed. Incorrect installations may result in damage to the system and lead to accidents.</p>
<p>動作前および電源を切った直後は、ハードディスクの表面が高温になっているので注意して下さい。 设备运行时以及刚切断电源后，硬盘表面温度会很高，请注意。 As the hard disk drives may retain heat after powering down allow ample for cooling prior to handling.</p>	<p>必ずユーザーズガイドを参照し、正しく接続して下さい。 对客户以及可选项设备进行连接时，请务必参照“用户指南”正确进行连接。如果错误连接，可能会导致故障或火灾的发生。 Refer to the "User's Guide" when option boards or peripherals are installed. Incorrect installations may result in damage to the system and lead to accidents.</p>
<p>Diskトレイを抜き差しする際は、指を挟まないよう注意して下さい。 插拔磁盘托架时请注意不要夹手。 To avoid the risk of personal injury, handle the disk tray with care when inserting/removing from the system.</p>	<p>必ずユーザーズガイドを参照し、正しく接続して下さい。 对客户以及可选项设备进行连接时，请务必参照“用户指南”正确进行连接。如果错误连接，可能会导致故障或火灾的发生。 Refer to the "User's Guide" when option boards or peripherals are installed. Incorrect installations may result in damage to the system and lead to accidents.</p>



## 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 part names described in the safety instruction chapter in this guide, refer to "Features and Controls" in Chapter 2.

---

### General

 <b>WARNING</b>	
	<p>Do not use the server for services where critical high availability may directly affect human lives.</p> <p>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. The manufacturer assumes no liability for any accident resulting in personal injury, death, or property damage if the server has been used in the above conditions.</p>
	<p>Do not use the server if any smoke, odor, or noise is present.</p> <p>If smoke, odor, or noise is present, immediately power off the POWER/SLEEP switch, disconnect the power plug from the outlet, then contact your service representative. Using the server in such conditions may cause a fire.</p>
	<p>Keep needles or metal objects away from the server.</p> <p>Do not insert needles or metal objects into the ventilation holes in the server or the openings in the floppy disk or CD-RW/DVD-ROM drive. Doing so may cause an electric shock.</p>
	<p>Do not use the server in any unapproved place.</p> <p>Install the server in a standard EIA 19-inch rack cabinet. Do not install the rack containing the server in an inappropriate environment. Failure to follow these instructions may cause interferences of various nature to the server and the other systems installed on the rack. Fires or personal injuries due to the rack fall may occur. For more information on the place where your server should be installed and the earthquake-resistant construction for the rack, refer to the manual attached to the rack or contact your service representative.</p>
	<p>Always install the server in a rack conforming to the relevant standard.</p> <p>Install the server on a rack conforming to the EIA standard for the server to be used. Do not use the server if it is installed in any other rack than the standard EIA 19-inch rack or if it is not installed in a proper rack. Failure to follow these instructions may cause your server to operate incorrectly and/or personal injury or damages of the surrounding devices to occur. Contact your service representative for the racks available for your server.</p>

 <b>CAUTION</b>	
 	<p>Keep water or foreign matter away from the server.</p> <p>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 power off the power and disconnect the power plug from the outlet. Do not disassemble the server. Contact your service representative.</p>

---

## Notes on Installing and Accessing the Rack Cabinet

### CAUTION



Do not carry or install the rack cabinet 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, resulting in personal injuries and/or surrounding devices to be broken. In particular, a high rack (such as 44U rack) is unstable if it is not secured using stabilizers.



Make sure that the load is not concentrated in 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 several racks together to distribute the load. Failure to follow this instruction may cause the rack to fall, resulting in personal injuries.



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

More than one person is required to install parts such as the rack doors and trays. Failure to follow this instruction may cause some parts to fall, resulting in personal injuries and/or devices to be broken.



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

Always make sure of the stability of the rack before pulling out a device.



Do not leave more than one device pulled out from the rack at the same time.

Pulling out several devices from the rack may cause the rack to fall.



Make sure the wiring of the server does not exceed the rating of the power supply.

To prevent burns, fires, and device damages, the power supplied to the server must not exceed the rating load of the power branch circuit. The server requires at least two power cords or up to four power cords (depending on your configuration). Connect each power cord to each appropriate wall outlet provided with 20A branch circuit. Contact your electric constructor or the local power company for the requirements on the wiring and installation of electric facilities.



Maintain reliable earthing

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

---

## Power Supply and Power Cord Use

### WARNING



Do not hold the power plug with a wet hand.

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

### CAUTION



Plug in to a proper power source.



Use a grounded wall outlet of the specified voltage. Using an improper power source may cause a fire or a power leak.

Do not install the server in a place where you need an extension cord. Using 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, and may cause a fire.



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

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



Use only the authorized power cord.



Use only the power cord that comes with your server. Using an unauthorized power cord may cause a fire if 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 a 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 specifically to be connected with this server, and its safety has been tested. Do not use the attached power cord for any other purpose. Doing so may cause a fire or an electric shock.

## Installation, Relocation, Storage, and Connection

### CAUTION



Never attempt to lift the server only by yourself.

Your server weighs 47 kg (depending on its hardware configuration). Carrying the server only by yourself may strain your back. Hold the server firmly by its bottom with at least three persons to carry it. Do not hold the front bezel to lift the server. The front door may disengage from the server, causing personal injury.



Do not install your server on a rack without its cover.



Failure to follow this instruction may reduce the cooling effect in the server, resulting in some malfunction and/or dust entering the server, and resulting in a fire or electric shock.



Do not pinch your finger with rails or other components.

Use a screwdriver or any other tool to press the safety latch release lever on the rack slide rail. Pressing the levers with your finger may cause an injury.



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

Doing so bends the frame of the server, and consequently, the server cannot be pushed back into the rack. Placing an object on the server may also cause a personal injury if the server should fall.



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

Do not install the server in the following places or any places other than the ones specified in this manual. Failure to follow this instruction may cause a fire.

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



Do not use the equipment in a 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 the corrosion and shorts of an internal printed board.

**⚠ 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 the power outlet before installing/removing any optional internal device or connecting/disconnecting any interface cable to/from the server. If you do not do so, 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 the interface cables provided by the manufacturer 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 when 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 the ones described in this manual. Failure to follow this instruction may cause an electric shock or fire, as well as malfunctions of the server.



Do not look into the CD-RW/DVD-ROM drive.

The laser beam used in the CD-RW/DVD-ROM drive can be harmful to the eyes. Do not look into or insert a mirror into the drive while the drive is powered on. The laser beam is invisible, but you may lose your eyesight.



Do not remove the lithium and NiMH batteries.

Your server contains lithium and NiMH batteries. Do not remove or replace the batteries. If the battery is incorrectly replaced, it may cause an explosion. Placing the battery close to a fire or in the water may also cause an explosion.

If the server does not operate appropriately because the batteries are dead, contact your service representative to replace the batteries only with the same or equivalent type recommended by the manufacturer. Do not disassemble the server in order to replace or recharge the battery yourself.



Disconnect all the power plugs before accessing the inside of the server or connecting the peripherals.

The server has two power cords.

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

Disconnect all the power plugs regularly from the outlet and clean them with a dry cloth. Heat will be generated if condensation forms on a dusty plug, and may cause a fire.

### CAUTION



Hot surface

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



Make sure to complete the board installation.

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



Protect the unused connectors with the protective cap.

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



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

Power flows inside the server while the hot-swap replaceable components (PCI add-in cards, hard disk drive, cooling fan, and power supply). Do not touch the electrical components inside the server to avoid an electric shock.

---

## During Operation

### CAUTION



Avoid contact with the server during thunderstorms.

Disconnect all the power plugs from the outlet when a thunderstorm is approaching. If it starts thundering before you disconnect the all power plugs, do not touch any part of the server including the cables. Failure to follow this warning may cause a fire or an electric shock.



Keep animals away from the server.



Failure to follow this warning may cause a fire or an electric shock.



Do not place any object on top of the server.

An object placed on top of the server may fall down, resulting in damage to your property around the server.



Do not remove the cooling fans.

Only a service technician authorized by the manufacturer can remove the cooling fans from the server.

## FOR PROPER OPERATION

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

- Install the server in a place that meets the requirements for successful operation. For more information, see Chapter 3, "Setting Up Your Server."
- Make sure to power off the server before connecting or disconnecting cables between the server and peripheral devices.
- Make sure that the access LED on the server is unlit before turning off the server or ejecting the floppy disk.
- The server management logic on your system board monitors and logs system voltage changes. When plugging the power cord to the system, you may experience a 10 seconds delay between power on and the time you pressed the POWER/SLEEP switch on the front panel. This is normal system operation and is required by the server management logic.
- If you power off the server, wait at least 30 seconds before powering it back on.
- Do not power off the server until characters following the full screen logo have appeared on the screen. It may take one to five minutes depending on your configuration.
- Power off the power and unplug the power cord from the outlet before relocating the server.
- Some software include a command allowing you to eject the CD-RW/DVD-ROM drive tray. Make sure that the front bezel is removed before running the command. Running this command with the front bezel installed may cause the CD-RW/DVD-ROM drive tray or the media to hit the front bezel, resulting in a failure of the server
- Clean the server on a regular basis. (See Chapter 7 for cleaning.) Regular cleaning proactively can prevent various failures of the server.
- Lightning may cause a momentary voltage drop. To prevent this problem, we recommend you use an uninterruptible power supply unit.
- Check and adjust the system clock before the operation if any of the following conditions is applicable.
  - After carrying of the server
  - After storage of the server
  - After the server entered into the pause state under the following environmental conditions (temperature: 10°C - 35°C, humidity: 20% - 80%)
- Check the system clock roughly once per month. If the system clock is installed in a system requiring high time precision, we recommended you use a time server (NTP server).  
If the system clock is delayed or advanced as time goes by in spite of adjustment, contact your sales agent and request a maintenance operation.
- Store the unit under the approved storage conditions (temperature: -10°C - 55°C, humidity: 20% - 80%, without condensation) to allow the built-in devices and the unit to operate correctly in the next operation.
- Make sure to use the 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.
- We recommend you use our genuine products. Some third-party products claim that they support our server. However, repairing the server due to a failure or damage resulting from the use of such third-party products will be charged.
- Playback of disks which do not conform to the CD or DVD standard is not guaranteed.
- Power off any cellular phone or pager. Radio interferences may cause malfunctions of the server.

## THIRD PARTY TRANSFER

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

### Server

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 the Windows "Recycle Bin" or execute a "format" command of the operating system. However, the actual data remains written on the hard disk drive, and may be restored by special software and used for unexpected purposes.

We strongly recommend that a software or service (both available at stores) for data erasure is used in order to avoid the troubles explained above. For more information on data erasure, ask your sales representative.

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

## CONSUMABLES

Your server contains some components that are only good for a limited period of time and require replacement, such as batteries, fans, the internal CD-RW/DVD-ROM drive, the floppy disk drive, and the mouse. For stable operation of the server, we recommend you replace these components on a regular basis. Ask your service representative for replacement or more information on the product lifespan.

## DISPOSAL OF THE SERVER

Dispose of the server, all the internal devices, floppy disks, and DVD/CD-ROMs according to your national laws and regulations. Also dispose of the power cord provided with the server so that it cannot be used with other devices.

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**IMPORTANT:** For disposal (or replacement) of the battery on the baseboard of the server, consult with your service representative.

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**NOTE:** If the real-time clock battery on the base board has reached the end of its life, the following message appears on the display while running the POST. Contact your service representative to replace the battery.

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0250 System battery is dead –Replace and run SETUP

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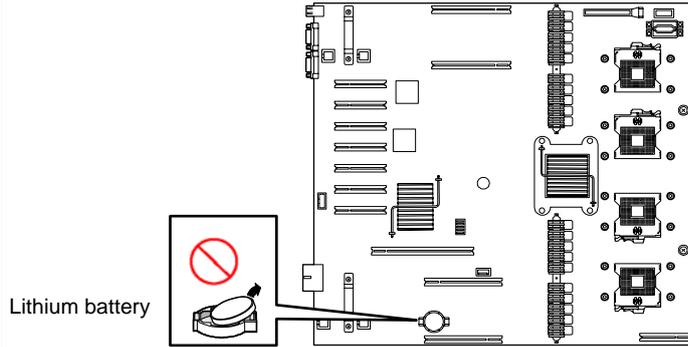
**⚠ WARNING**



Do not remove the lithium and NiMH batteries.

Your server contains lithium and NiMH batteries. Do not remove the battery. There is a danger of explosion if the battery is incorrectly replaced. Placing the lithium or NiMH battery close to a fire or in the water may cause an explosion.

When the server does not operate appropriately due to the failure of lithium and NiMH batteries, contact your service representative to replace only with the same or equivalent type recommended by the manufacturer. Do not disassemble the server to replace or recharge the battery by yourself.



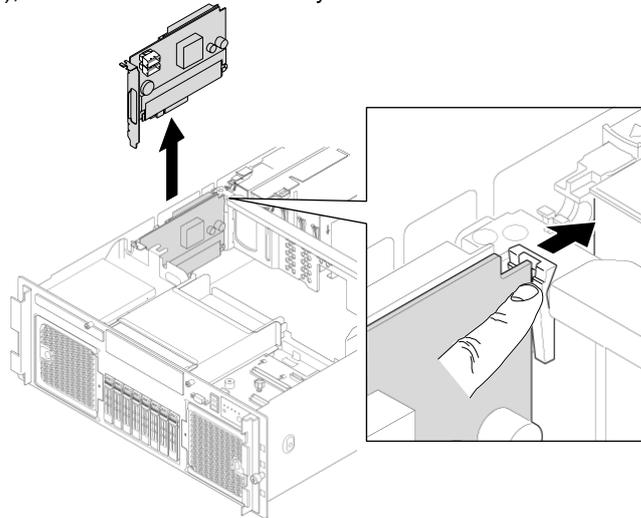
Lithium battery

**Base board**



The onboard or optional RAID Controller (Disk Array Controller) also contains a Ni-MH battery.

To dispose of the Ni-MH battery, remove the RAID Controller (Disk Array Controller), and then remove the battery from the board.



For the battery location of the optional RAID Controller (Disk Array Controller), refer to the manual coming with the RAID Controller (Disk Array Controller).

## USER SUPPORT

When the server requires after-sales service, check if the warranty is still valid, and determine which service is necessary as indicated on the "Certificate".

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 one of the descriptions. If it does, take the recommended measure to try and correct the issue.
3. Check if the software required for the operation of the server is properly installed.
4. Check the server using a computer virus detection program. Computer virus detection programs are available for purchase in stores.

If the server still appears to fail after you have checked the above points, consult with your service representative. Take notes on LED indications of the server and alarm indications on the display unit before calling, these may provide a significant help to your service representative.

### When your server will be repaired

Prepare the following when having your server repaired:

- Certificate
- Notes of the messages displayed on the display unit
- Error information\*
- Records of the server and peripheral equipments

\* Error information includes the Error Message shown in Chapter 8.

Prepare the error information only when required by 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

Your working posture is good 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.

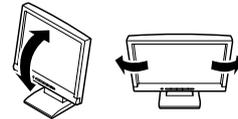
No part of your body must be under excessive strain, your muscles must be relaxed.

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



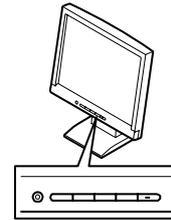
### Adjustment of the Display Unit Angles

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 a "good working posture" and you will feel more tired than you should if you operate a display unit without adjusting horizontal and vertical angles.



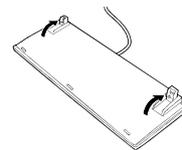
### Adjustment of Screen Brightness and Contrast

The display unit has brightness and contrast adjustment functions. The most suitable brightness and contrast adjustment depends on the individual and on the working environment (well-lighted room or insufficient light). Adjust brightness and contrast so that the screen is easy to see. An extremely bright or dark screen will have cause eye troubles.



### Adjustment of the Keyboard Angle

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



### Cleaning the Equipment

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

### Fatigue and Rest

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



# Chapter 2

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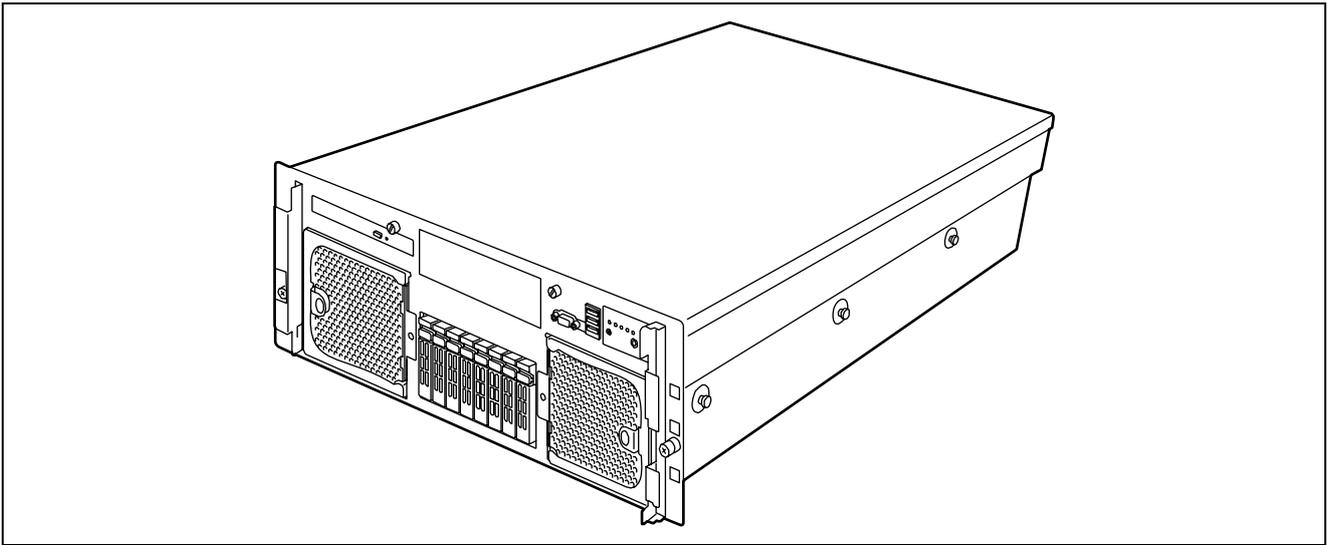
## General Description

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 highly reliable, high-powered, fault-tolerant, high-capacity, multiprocessing server based on the Quad-Core Intel® Xeon® Processor 7300 series or Dual-Core Intel® Xeon® Processor 7200 series. It is a solid performer and offers the latest technology. The combination of computing performance, memory capacity, and integrated I/O provides a high performance environment for many server market applications. These range from large corporations supporting remote offices, to small companies looking to obtain basic connectivity capability such as file and print services, e-mail, web access, web site server, etc.

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

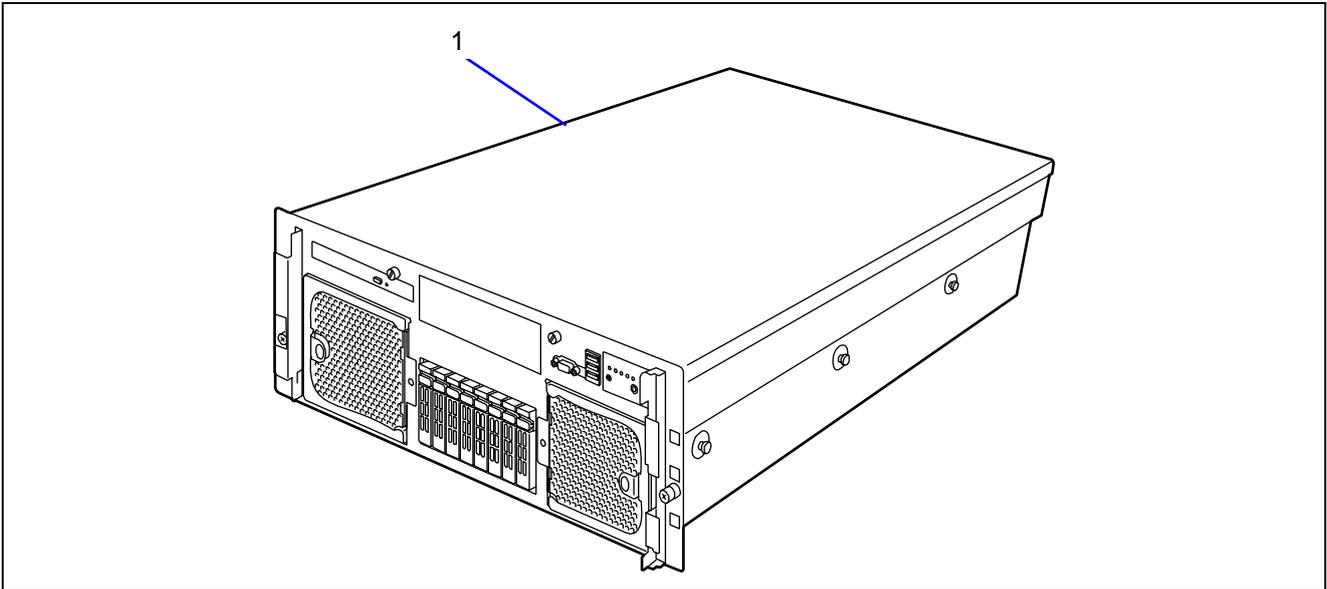


Your server includes a CD-RW/DVD-ROM drive, a 2.5-inch hard disk drive bay, and removable media device bay (Option). The 2.5-inch hard disk drive bay can contain up to eight hard disk drives.

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

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## Top View

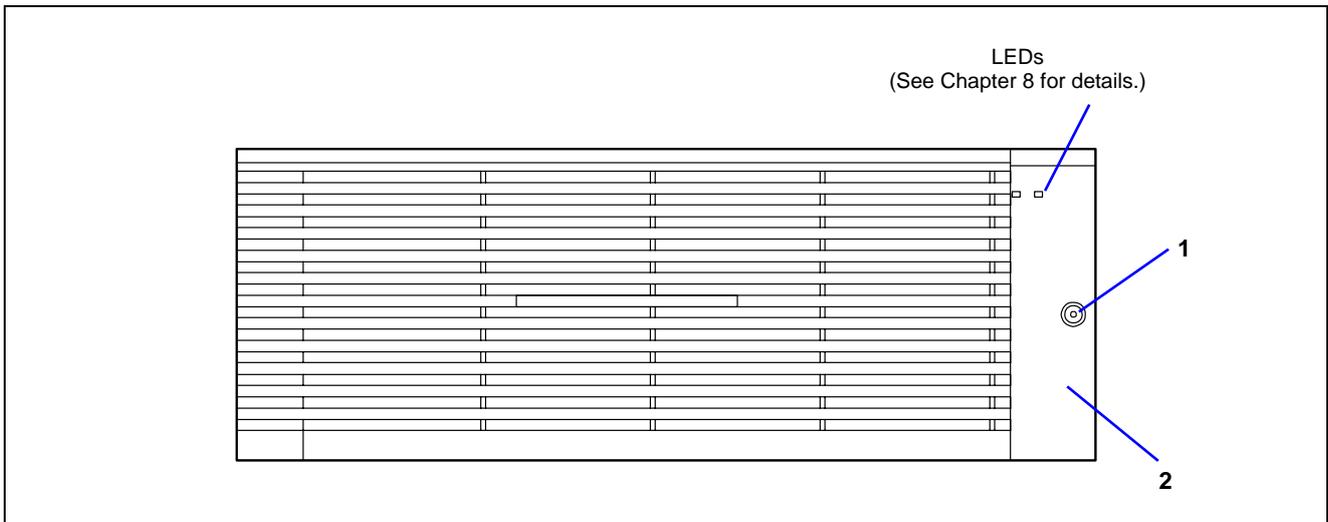


### 1 Top cover

Open the top cover to install or remove optional memory boards, DIMMs, PCI boards, and fans.

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## Front View



**1 Key hole**

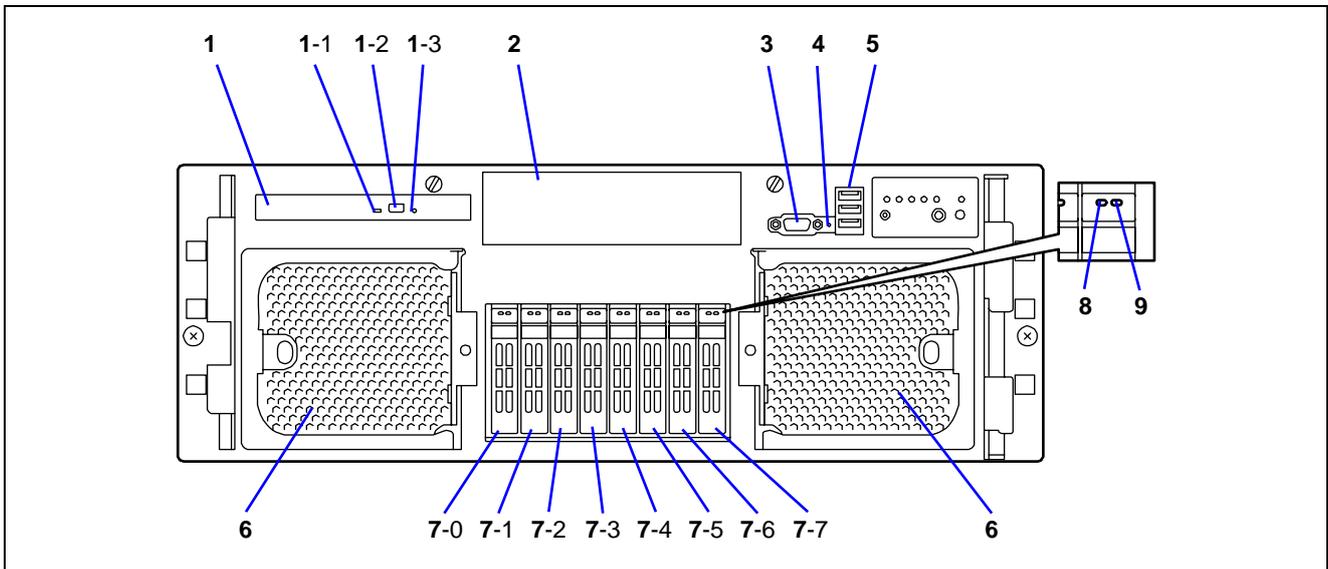
Insert the security key to lock/unlock the front bezel

**2 Front bezel**

Open the front bezel to access the POWER/SLEEP switch, 5.25-inch device (option), or CD-RW/DVD-ROM drive, or to install or remove the USB floppy disk drive, hard disk drive, processor, memory board, DIMM, PCI board, and fan.

## Front View (with Front Bezel Removed)

Refer to Chapter 8 for more information on the LEDs indications.

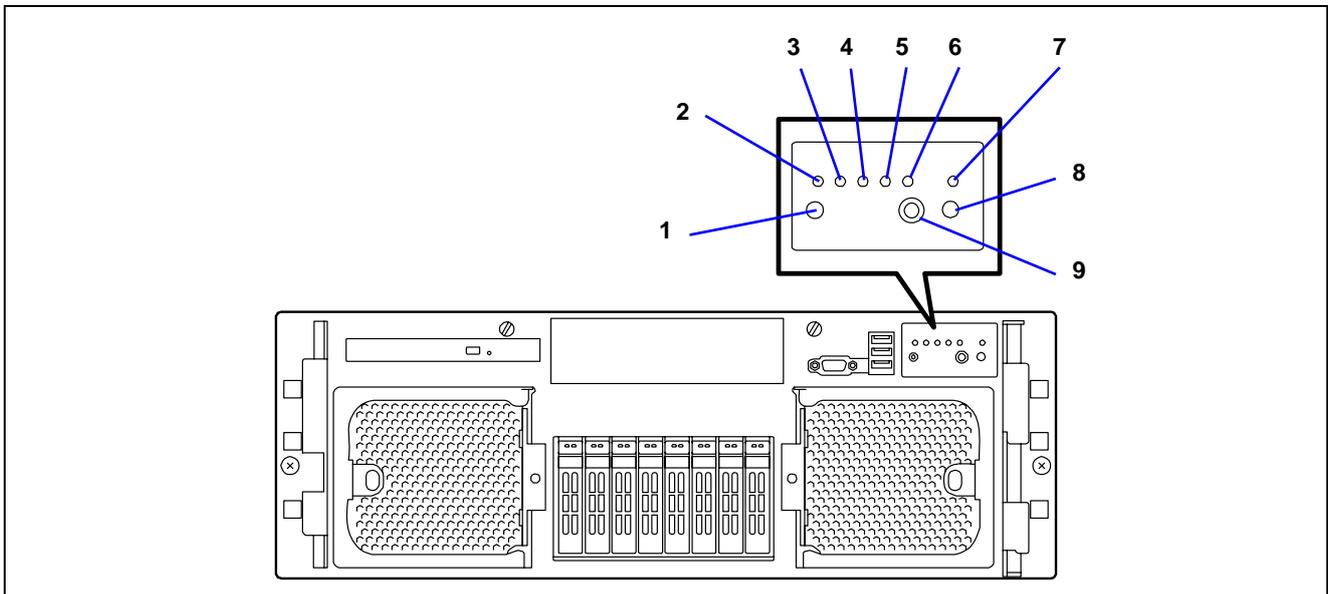


- 1 CD-RW/DVD-ROM drive**  
The CD-RW/DVD-ROM drive reads data from the inserted CD/DVD-ROM.  
1-1: Access LED (lights orange during the access)  
1-2: CD/DVD tray eject button  
1-3: Emergency hole
- 2 5-inch device bay**  
Install a 5-inch device into this slot.
- 3 Monitor connector** (only for maintenance use)  
Do not connect any display unit. This connector is exclusively used for maintenance.
- 4 DUMP switch**  
Press this switch to collect a memory dump if the memory dump feature is enabled on the operating system (see Chapter 8).
- 5 Front USB1 (top) / Front USB2 (middle) / Front USB3 (bottom) connectors**  
Connect a device supporting the USB 2.0 (Hi-speed) interface.
- 6 Front fan box**
- 7 2.5-inch device bay**  
Install a 2.5-inch hard disk drive. The last digit represents the slot number.
- 8 DISK Access LED**
- 9 DISK Error LED**

---

## Front View (Switches and LEDs)

Refer to Chapter 8 for more information on the LEDs indications.



**1 RESET switch**

Press this switch to reset the server.

**2 DISK Access LED**

**3 LAN1/2 access LED**

**4 LAN3/4 access LED**

**5 STATUS LED**

**6 POWER/SLEEP LED**

**7 UID (Unit ID) LED**

**8 UID (Unit ID) switch**

Use this switch to turn on or off the ID LED located on the front and rear panels of the server. Pressing this switch once turns on the UID LED, and pressing it again turns it off.

**9 POWER/SLEEP switch**

Use this switch to power on/off the server.

If you press the switch once, the POWER/SLEEP LED goes on and the power is turned on.

If you press the switch again, the power is turned off.

The system is forcibly shut down when the power switch is pressed continuously for four seconds or longer.

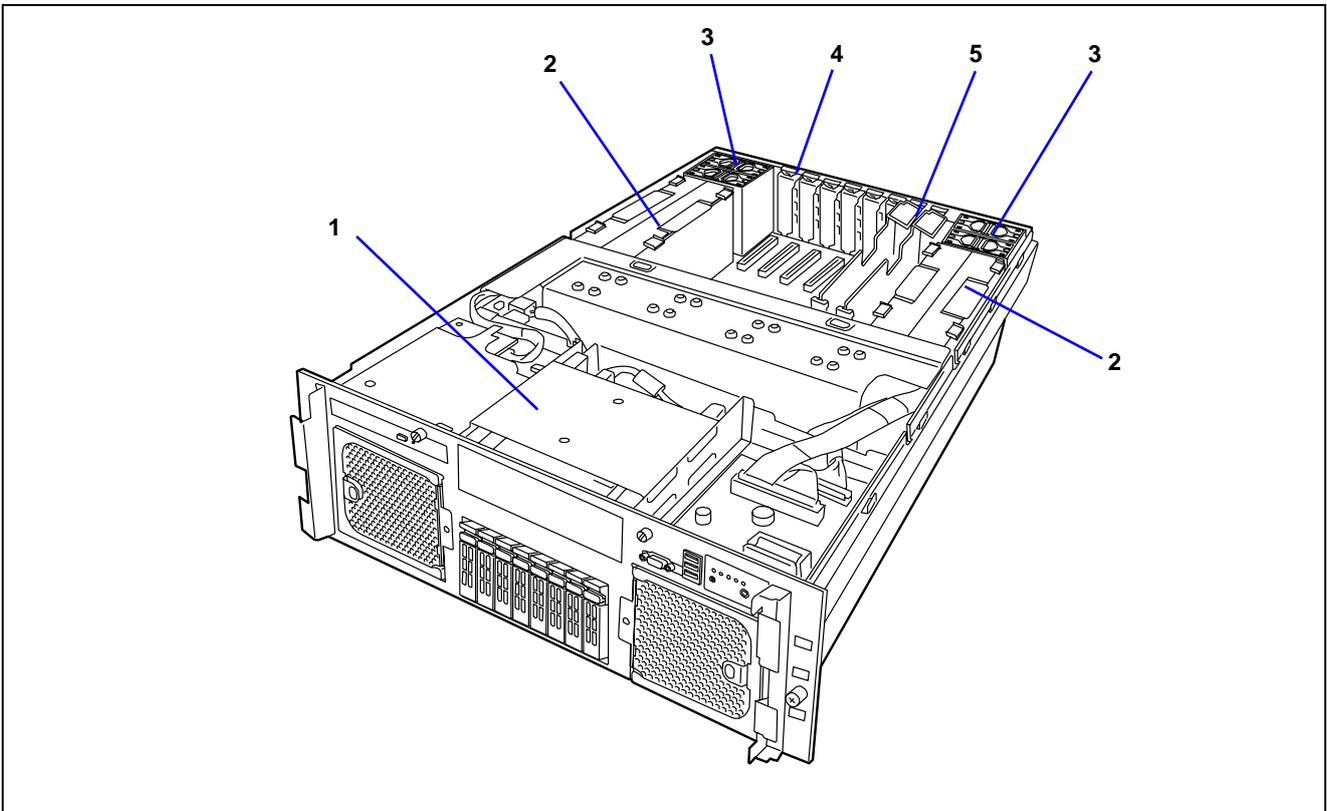
When the sleep feature is enabled:

- pressing this switch once places the server in sleep (power saving) mode,
- and pressing this switch again resumes the normal state (supported in Windows Server 2003).



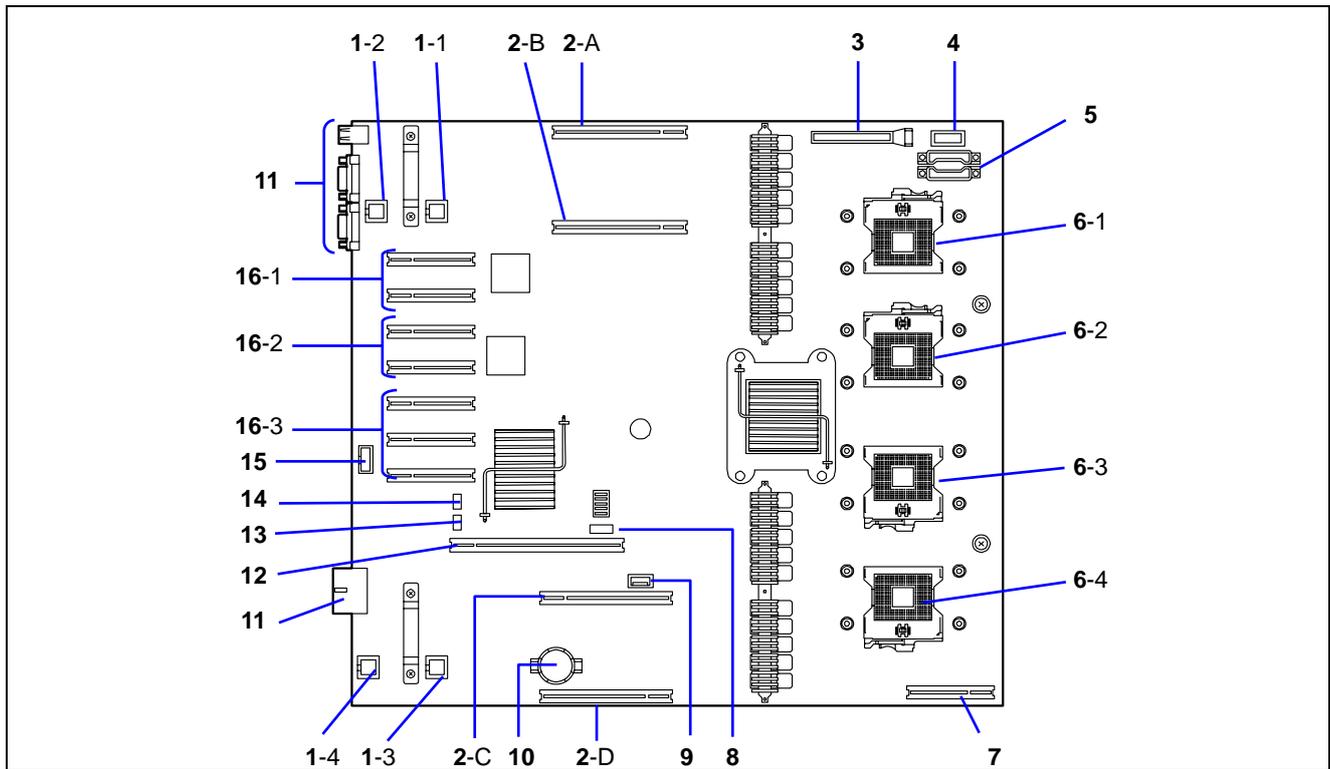
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## Internal View



- 1 5-inch device bay
- 2 Memory board
- 3 Rear fan bay
- 4 Non-hot-plug PCI slot
- 5 Hot-plug PCI slot

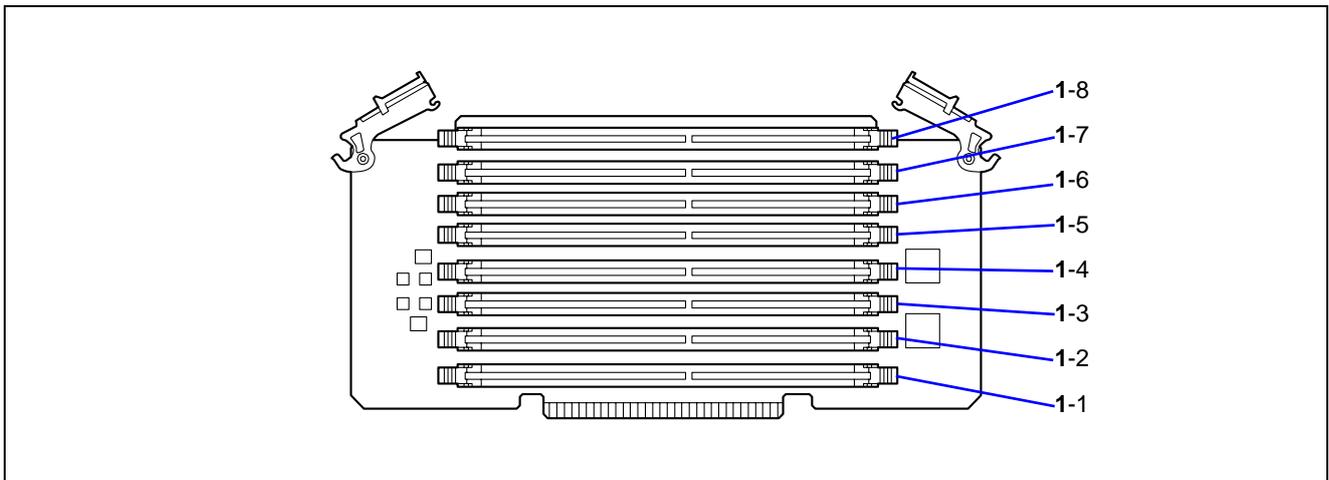
## Base Board



- 1 Rear fan connector**  
The last digit represents the port number.
- 2 Memory board connector**  
The last digit represents the port number.
- 3 Front panel connector**
- 4 Power BP interface connector**
- 5 Power connector**
- 6 Processor socket**  
The last digit represents the port number.
- 7 SAS riser connector**
- 8 SATA connector**
- 9 Internal USB connector**
- 10 Lithium battery**
- 11 Connectors for external devices**
- 12 I/O riser connector**
- 13 Jumper switch for clearing password**
- 14 Jumper switch for clearing CMOS**
- 15 Internal serial port A**
- 16 PCI Express board slot (PCI #1 to #7 from top)**  
16-1: PCI #1 and #2 (Hot-plug PCI Express x8)  
16-2: PCI #3 and #4 (Non-hot-plug PCI Express x8)  
16-3: PCI #5, #6, and #7 (Non-hot-plug PCI Express x4)

---

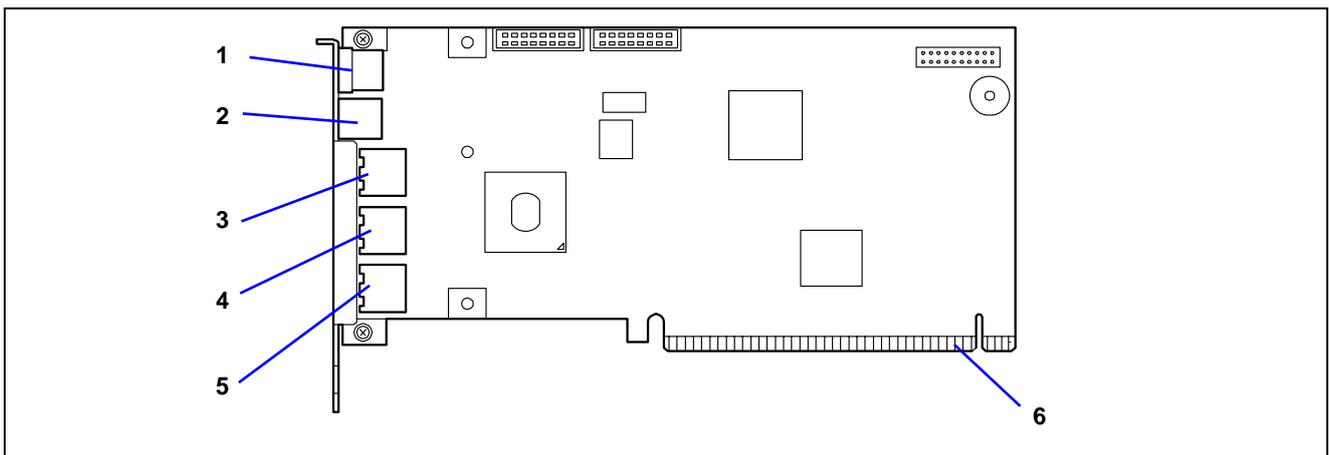
## Memory Board



- 1 DIMM slot (The last digit represents the slot number.)

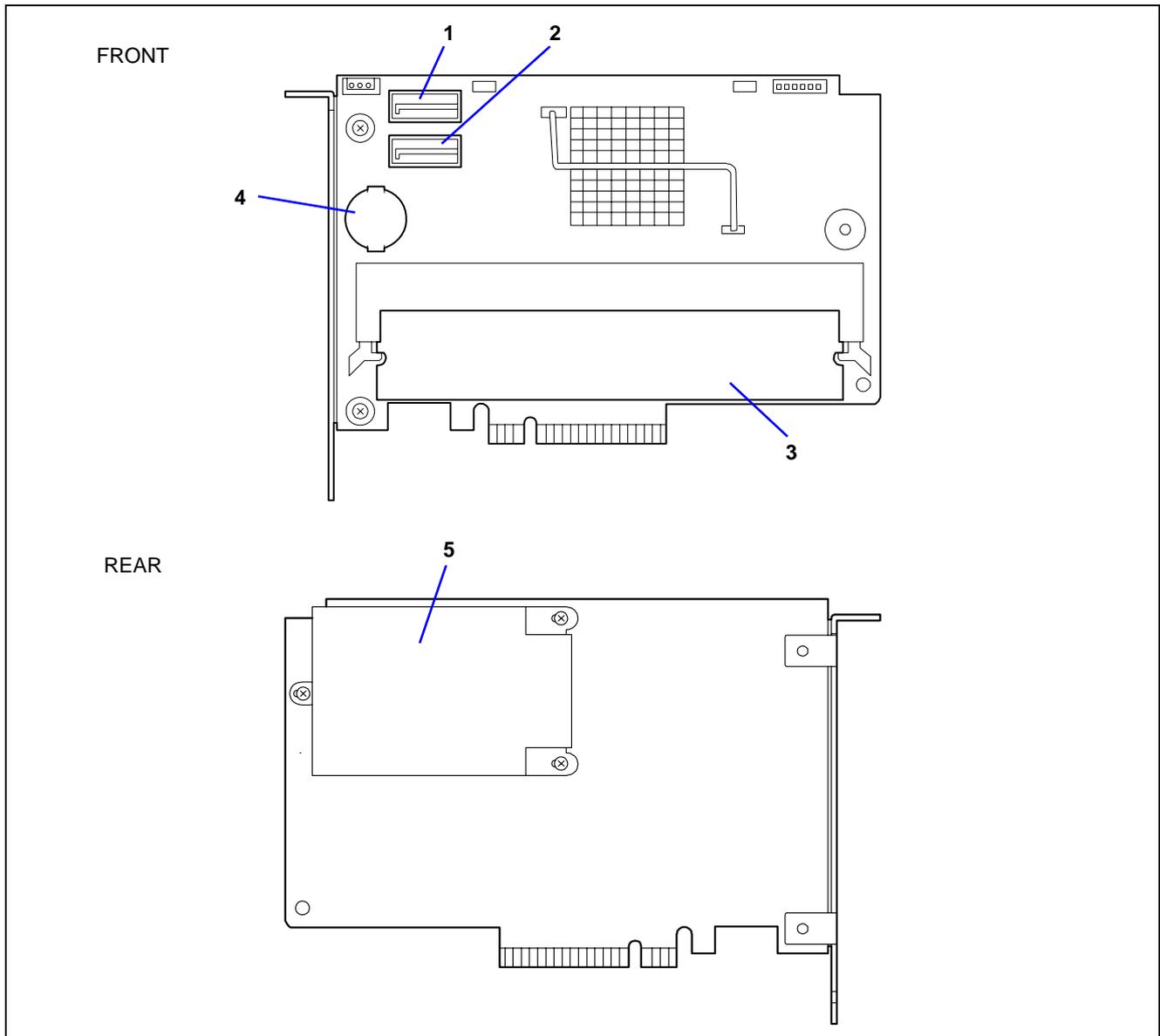
---

## I/O Riser Board



- 1 Mouse connector  
2 Keyboard connector  
3 Management LAN connector  
4 LAN connector #4  
5 LAN connector #3  
6 Baseboard interface connector

## SAS Riser Board

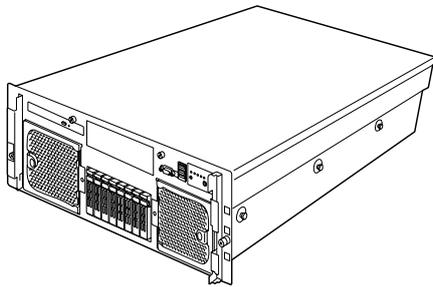


- 1 SAS port A
- 2 SAS port B
- 3 DIMM connector for RAID
- 4 RAID activation key
- 5 Ni-MH battery for RAID

## STANDARD FEATURES

### High performance

- Intel® Xeon® Processor 7300/7200 series
  - E7210 (Clock speed: 2.40GHz, Secondary cache: 2x4MB)
  - X7350 (Clock speed: 2.93GHz, Secondary cache: 2x4MB)
- High-speed memory access (Supports DDRII 667 FB DIMM -compliant interleaved memory)
- High-speed 1000BASE-T/100BASE-TX/10BASE-T interface (4 ports) (1000Mbps/100Mbps/10Mbps supported)



### High-reliability

- Memory mirroring feature
- Online sparing memory feature
- Memory monitoring feature (error correction/error detection)
- Memory chipkill feature supported
- Memory/processor degradation feature (logical isolation of a failed device)
- Bus parity error detection
- Thermal sensor
- Error notification
- Internal cooling fan monitoring feature
- Internal voltage monitoring feature
- BIOS password feature
- Security feature (security lock)
- Redundant power supply (for 200 to 240 VAC power or partially for 100 to 120 VAC)
- RAID system (Onboard RAID Controller)

### Expandability

- Wide variety of optional I/O slots
  - 4 PCI Express (x8) slots (2 slots support hot-plug)
  - 3 PCI Express (x4) slot (x8 board can be installed)
- Large memory of up to 128 GB
- 2.5-inch hard disk drive bay holding 8 hard disk drives
- Remote power-on feature
- Up to four multi-processors are available for upgrade.
- USB 2.0 interface
- Backup device bay

### Many Available Features

- El Torito Bootable CD-ROM (no emulation mode) format support
- POWER switch mask
- Software power-off
- Remote power-on feature
- AC-LINK feature
- Intelligent Platform Management Interface (IPMI) feature
- Baseboard Management Controller (BMC)
- Remote console feature

### Self-diagnosis

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

### Maintenance Features

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

### Power Saving Feature

- Sleep feature (available for Windows Server 2003)

### Easy and Fine Setup

- EXPRESSBUILDER (system setup utility)
- Express Setup
- SETUP (BIOS setup utility)
- RAID Configuration Utility

### Management Utilities

- NEC ESM PRO
- NEC DianaScope
- Remote Management Feature

---

## Power Supplies

The server can continue its operation without interruption even if a single power supply unit fails (power redundant configuration).

In addition, if the AC power of each power supply unit is divided into two lines, the server can continue its operation without power interruption even if one of the AC power line fails (AC power redundant configuration).

If the power cord is disconnected from the power supply unit immediately after it is connected, the event "power degraded" may not be registered in the OS event log, and only the event "power recovered" is registered.

### Redundant Power Configuration

Your server is configured with the 100 VAC non-redundant power supply system at the factory.

To use your server with the redundant power system (100 VAC or 200 VAC), update the Platform Information Area (PIA) and Sensor Data Record (SDR) in the server firmware.

Contact your supplier to obtain the latest firmware.

---

## Peripheral Bays

The server is equipped with one slot to install a backup device such as a magnetic tape drive.

### Available Devices

The 5-inch device slot can contain a single-height SCSI device.

- Setting the SCSI ID

When connecting the 5-inch device with the optional SCSI controller, refer to the manual that comes with the SCSI controller.

- Setting the terminator

Set the terminator to "OFF".

---

## Memory Mirroring Feature

### Memory Mirroring Feature

The memory mirroring feature sets a memory board as spare memory in standby state. If the current memory board encounters an uncorrectable error, the memory mirroring feature switches to the standby memory board. When this feature is used, the current memory board and the standby memory board should be combined. Available combinations are:

- Mirroring with a pair of memory boards A and B and a pair of memory boards C and D

To enable the memory mirroring feature, the combined memory boards must have DIMMs of same size and capacities.

### Setting the BIOS

Start SETUP and select [Advanced] → [Memory Configuration] → [Memory RAS Feature] perform the following settings:

- To enable the memory mirroring feature: Select [Mirror].

### Others

- Memory capacity displayed on the OS = total capacity of physically installed memory – capacity for standby memory  
Memory mirroring feature: 1/2 of actually installed memory capacity
- Enabling the memory mirroring feature does not influence the applications operations.
- The mirroring feature is automatically disabled when an error message is displayed:

The following indicates that the memory mirroring feature is in use:

- a) The failing DIMM group is degraded when the server restarts.
- b) If the NEC ESMPRO Agent has been installed, the following log is registered as a system log of Event Viewer:
  - Source name: ESMCommonService
  - Event ID: 2313
  - Explanation: Part of the DIMM was isolated due to a memory error.
  - Memory number: XX
  - Date/time: XX
- c) If a report setting is specified through the NEC ESMPRO Agent, a Manager reporting and ALIVE reporting are performed. The report contents are as follows:
  - Explanation: Part of the DIMM was isolated due to a memory error.
  - Memory number: XX
  - Date/time: XX

---

## System Cooling

The chassis top cover must be installed for proper system cooling. Cooling components must be hot-swapped within two minutes. This time period applies only to the time that the cooling component is physically removed, not from the time of failure.

The cooling subsystem consists of hot-swap, redundant (7+1) fans. In a redundant configuration, the system supports one fault at a time, either one fan fault or one power supply fault, and it supports the hot swapping of one component at a time. If a cooling component fails, the system cooling is maintained and the system continues to operate while the component is hot swapped.

---

## System Board Features

The following subsections describe the system board major components.

### Processor

The processor board accommodates one to four Intel® Xeon® Processor 7300/7200 series in the FC-PGA2 package.

### DIMM Memory

To install or remove the DIMM, remove the memory board first. One memory board is factory-installed in the server. Up to four memory boards (128GB maximum) can be installed in the server.

Install the DIMM (Dual Inline Memory Module) to the DIMM socket on the memory board in the server. DIMMs are installed in the ascending order of the DIMM socket numbers in the unit of two modules.

### Onboard Video

The baseboard incorporates a Pilot II graphics accelerator with 16MB of video SDRAM. The onboard video can be disabled through the BIOS Setup or when a video card is installed in any of the PCI Express slots.

## LSI MegaRAID™ SAS PCI EXPRESS™ ROMB

The SAS riser card includes the LSI MegaRAID™ SAS PCI EXPRESS™ ROMB (called "On Board RAID (MegaRAID ROMB)" hereafter) The On Board RAID (MegaRAID ROMB) supports the following features:

- Dual-channel SAS interface (CH0 and CH1)  
Connect the HDD cage to CH0 and CH1.
- RAID levels 0, 1, 5, 6, 10, and 50
- 512MB of cache memory
- Battery-backup cache memory (option)

## Network Interface Controllers

---

**NOTE:** To ensure EMC product regulation compliance, the system must be used with shielded LAN cables.

---

The base board includes Intel 82563EB Physical Layer Transceiver (PHY), and the I/O riser card includes the Intel 82575EB Network Interface Controller (NIC). Both chips support the following features:

- Two channels of 10Base-T, 100Base-TX, and 1000BASE-T networks.
- The both chips provide the standard IEEE 802.3 Ethernet Interface for 1000Base-T, 100Base-TX, and 10Base-T (802.3, 802.3u, 802.3ab).

## Remote Management

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

The EXPRESSSCOPE Engine 2 uses the BMC (Baseboard Management Controller) as a system management LSI.

The EXPRESSSCOPE Engine 2 provides the following features:

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

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

---

**NOTE:** The measured value of temperature, voltage, fan, or electric power may contain an error depending on the operating environment.

---

## Degradation Feature

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

Failed DIMMs, processors, and cooling fan may be identified on the screen that the POST displays, or with the BIOS setup utility, "SETUP." They may also be identified on a system on which NEC ESMPRO installed.

## Remote Power-On Feature (Wake On LAN/PME)

The remote power-on function powers on the server through a network. It sends a special packet from the management computer to power on a remote server that is powered off.

To enable this feature, you must select "Enabled" for "Wake On LAN/PME" in the Advanced Chipset Control 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/SLEEP switch once to start the OS, and turn off the server using 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.)

---

**NOTE:** Wake On LAN feature is supported in 100BASE-TX/1000BASE-T adapter on the base board and I/O riser board.

---

## 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. AC-LINK feature can be enabled or disabled with "AC-LINK" in the Server menu of the BIOS setup utility, "SETUP." (See Chapter 4.)

---

## **Security**

To help prevent unauthorized entry or use of the system, the system includes a full lockable front panel and a Server Management software that monitors the system intrusion switches.

### **Security with Mechanical Locks and Monitoring**

The front bezel of the server features a mechanical lock to prevent access to the front of the computer chassis.

The computer chassis includes an intrusion switch for the top cover. When this cover is opened, the switch transmits an alarm signal to the system board, where server management software processes the signal.

### **Software Locks via the System Setup Utility**

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

- Enable the keyboard lockout timer so that the server requires a password to reactivate the keyboard and mouse after a specified time-out period – 1 to 120 minutes.
- Set and enable an administrative password.
- Set and enable a user password
- Set a secure mode to prevent keyboard or mouse input and to prevent use of the front panel reset, power and sleep switches.
- Activate a hot-key combination to enter the secure mode quickly.
- Disable writing to the floppy disk drive when the secure mode is set.

---

## EXPRESSBUILDER

The EXPRESSBUILDER helps you install the Operating System, the Management software or use the maintenance utilities.

Refer to Chapter 6 for details.

The functions of the EXPRESSBUILDER are:

- To install the Operating System.  
"Express Setup" helps you install the Windows. (See Chapter 5.)
  - To diagnose the system.  
EXPRESSBUILDER includes the test and diagnostics to check your server. (See Chapter 6.)
  - To create the drivers disks\*.  
Use this function to create the OEM-Disk which is used at the Windows manual installation. (See Chapter 6.)
  - To update the BIOS.  
Use this function to update the system BIOS or firmware of the server. (See Chapter 6.)
  - To update the Windows System\*.  
"Update the system" in the Autorun Menu updates several Windows resources. (See Chapter 6.)
  - To install the applications\*.  
You can install several Windows applications from the Autorun Menu. (See Chapter 6.)
  - To read the documents\*  
You can access the documents from the Autorun Menu. (See Chapter 6.)
- \* These functions are available under Windows system.

---

## NEC ESMPRO

NEC ESMPRO is a server management software that runs on the OS. NEC ESMPRO includes the NEC ESMPRO Manager for the server monitoring terminal and the NEC ESMPRO Agent for the server.

---

**NOTE:** For more information on the major functions of NEC ESMPRO, system configuration and setups done with NEC ESMPRO, see Chapter 6. Available functions 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 7 for details.

---

## System Diagnostic Utility

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

---

## NEC DianaScope

The NEC DianaScope is a software for the remote management of the server.

The NEC DianaScope can control the managed server even if the OS is not running on the managed server.

See Chapter 6 and online document in the EXPRESSBUILDER.

## USING YOUR SERVER

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

---

### Front Bezel

Remove the front bezel to power on/off the server, to access the CD-RW/DVD-ROM drive, and to install/remove hard disk drives to/from the 2.5-inch hard disk drive bay.

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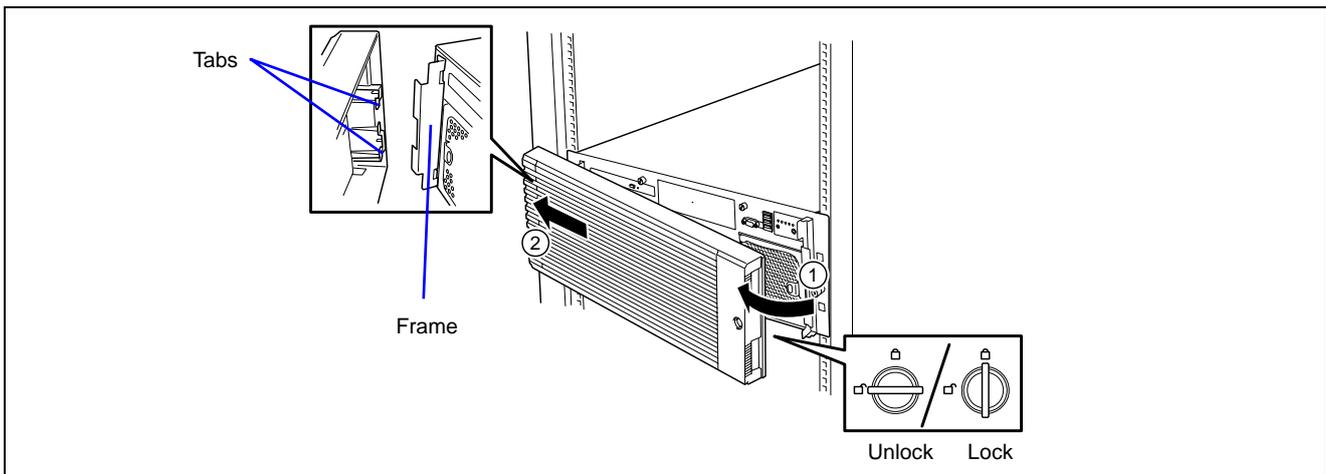
**IMPORTANT:** To open the front bezel, you must unlock the door with the provided security key.

---

### Installing or Removing the Front Bezel

You must remove the front bezel when powering on/off the server, accessing the CD-RW/DVD-ROM drive, installing/removing a hard disk drive to/from the 2.5-inch hard disk drive bay, or removing the top cover.

1. Insert the attached security key into the key slot, press slightly on the key and turn it one quarter to the left to release the lock.
2. Hold the right end of the front bezel lightly and pull it toward you.
3. Slide the front bezel to the left a little to remove the tab from the frame and then remove the front bezel from the server.



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

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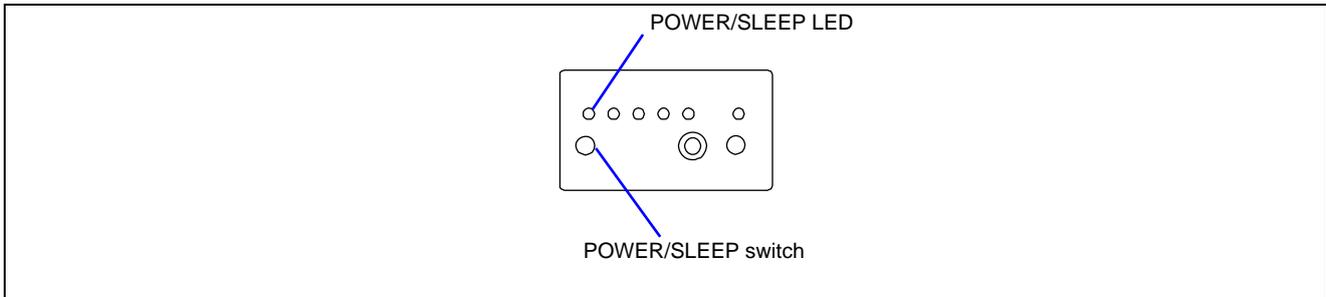
## POWER/SLEEP Switch

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

### Power On

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

The POWER/SLEEP LED lights in green.



---

### IMPORTANT:

- If the power cord is connected to a power control device such as a UPS (Uninterruptive Power Supply), make sure that the power control device is powered.
  - If the power cord is connected to the server, an initial diagnosis of the hardware starts. The POWER/SLEEP switch does not work during this diagnosis. Wait for about 30 seconds, and press the POWER/SLEEP switch.
  - Do not power off the server until the characters following the full-screen logo appear on the screen. Depending on your configuration, it may take three to five minutes.
- 

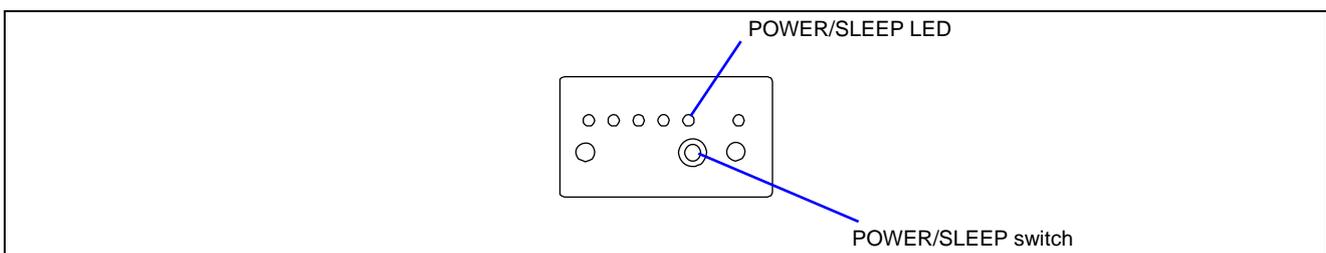
### Sleep

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

---

**NOTE:** To use the SLEEP switch, an OS supporting the sleep feature is required.  
(Available in Windows Server 2003)

---



Provide the settings for power saving on the operating system, then press the POWER/SLEEP switch on the front of the server to place the server in the power-saving mode. (The POWER/SLEEP 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/SLEEP switch. (It may take a little time to resume the original state.)

---

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

---

---

**IMPORTANT:** Do not change the system configuration while in a power-saving mode, you might fail to resume the original state.

---

---

## POST

The POST (Power On Self-Test) is the self-diagnosis feature saved in the base board of the server.

When the power of the server is turned on, the POST automatically runs to check the base board, I/O riser board, memory board, processor, keyboard, and mouse. During the POST, messages indicating that several BIOS setup utilities are started may also appear.

At the shipment of the server, it is set to have a full screen logo appear on the display unit during POST. Pressing **Esc** allows the information to be displayed during the POST execution.

---

**NOTE:** The POST results can be automatically displayed (without pressing the **Esc** key). To achieve this, open the BIOS Setup Menu, and change the "Boot-time Diagnosis Screen" setting from "Advanced" to "Enabled".

---

It may not always be necessary to check the POST results. Check the POST messages in the following cases:

- Installation of the server
- Suspicion of failure
- Abnormal number of beeps in the period between power-on and OS start
- Error message on the display unit

## POST Flow

The flow of the operations executed by POST is sequentially described below:

---

**IMPORTANT:** Depending on the system configuration, the message "Press Any Key" may appear on the display screen for an installed optional board. Refer to the option manual and press any key.

---

1. After power-on, the POST is activated to start the memory check. The message indicating the counted size of the base memory and that of the additional memory appears at the upper left corner of the display screen. In addition, the following message appears at the bottom of the screen.

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

---

**NOTE:** If you change the factory-default for [Extended RAM Step] in [Advanced] menu of BIOS SETUP and execute the memory test, pressing **Space** skips the memory test.

---

It may take several minutes to complete the memory check depending on the size of the memory installed in the server. Similarly, it may take about a minute to display the proper information on the screen at rebooting.

2. If optional boards, such as a RAID Controller are installed, the POST displays a message prompting the start of the BIOS setup utility for the optional board.

Refer to the manual that comes with the option board for more information.

When you press **Ctrl** and any other key at the same time to start the setup utility of the optional board, a subsequent key entry may sometime fails (e.g., key entry is not accepted or incorrectly recognized). In this case, press **Ctrl** again to recover.

3. The POST displays the SCSI ID numbers used by the connected SCSI devices on the screen.
4. The POST detects the Onboard RAID Controller and displays the message prompting the start of the WebBIOS (if no keyboard key is pressed, the POST automatically continues). If necessary, press the keys according to the screen display.

LSI MegaRAID SAS-MFI BIOS Version XXXX (Build MMM DD, YYYY)  
Copyright (c) 2007 LSI Logic Corporation  
HA -X (Bus X Dev X) MegaRAID SAS PCI Express(TM) ROMB  
FW package: X.X.X-XXXX  
X Logical Drive(s) found on the host adapter.  
X Logical Drive(s) handled by BIOS  
Press <Ctrl> <H> for WebBIOS

Now press **Ctrl + H**. The utility starts upon the POST completion.

---

**NOTES:**

- Using WebBIOS allows you to build or change the RAID configuration with internal SAS hard disk drives.
  - To build or change RAID configuration with SAS hard disk drives connected to the LSI Logic MegaRAID SAS 8480E Disk Array Controller, use the Universal RAID Utility. WebBIOS does not support this feature.
  - The Onboard RAID Controller (MegaRAID ROMB) has a factory-installed battery. See Chapter 8 for error messages related to the battery. See also "Battery for Onboard RAID Controller (MegaRAID ROMB)" in Chapter 4.
- 

5. Displays the message notifying you of the detection of the processor and of the connected keyboard and mouse.
6. Displays any of the following messages.

Pattern 1:

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

Pattern 2:

Press <F1> to resume, <F2> to enter Setup, <F12> to Network

\* The displayed message varies depending on the device status.

---

**NOTE:** The operation or utility to be started at each key entry is described below. These operations or utilities may not always be started.

■ **F2**

Press **F2** to start the BIOS setup utility. Start the utility to change the settings of the server in order to fit the environment in which the server is used. In general, the settings require no changes, except when an error message is displayed. See Chapter 4 for more information.

■ **F12**

Press **F12** to run the network boot.

■ **F1**

If message "Press <F1> to resume" appears, an error has been detected during POST. See "Error messages during POST" for the information on the messages and the proper actions to take to solve the errors. If an error message appears, pressing **F1** allows the BIOS setup utility to be started.

---

7. When a password is set in the BIOS setup utility SETUP, the screen prompting you to enter the password appears after the normal termination of POST.

The password can be entered for up to three times. After three wrong entries, the server cannot be started. In this case, power off the server, wait for about 10 seconds, and then power on the server again.

---

**IMPORTANT:** Set the password only after the OS installation.

---

8. The OS starts at the end of the POST.

## POST Error Messages

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

---

**IMPORTANT:** Note the messages displayed before consulting with your service representative. Alarm messages are useful information for maintenance.

---

## Power Off

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

---

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

---

1. Shut down the OS.
2. Press the POWER/SLEEP switch on the front of the server.  
The POWER/SLEEP LED goes off.
3. Power off the peripheral devices.

---

## Floppy Disk Drive

Your server is not equipped with a floppy disk drive. Use the optional USB floppy disk drive if necessary.

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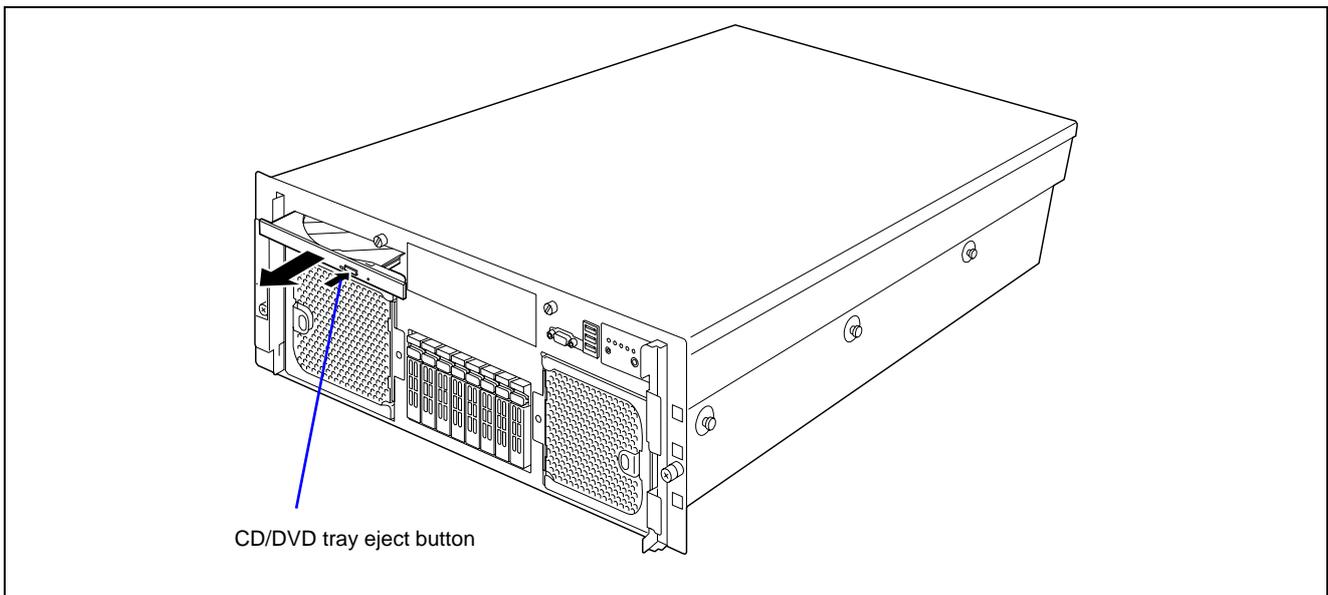
## CD-RW/DVD-ROM Drive

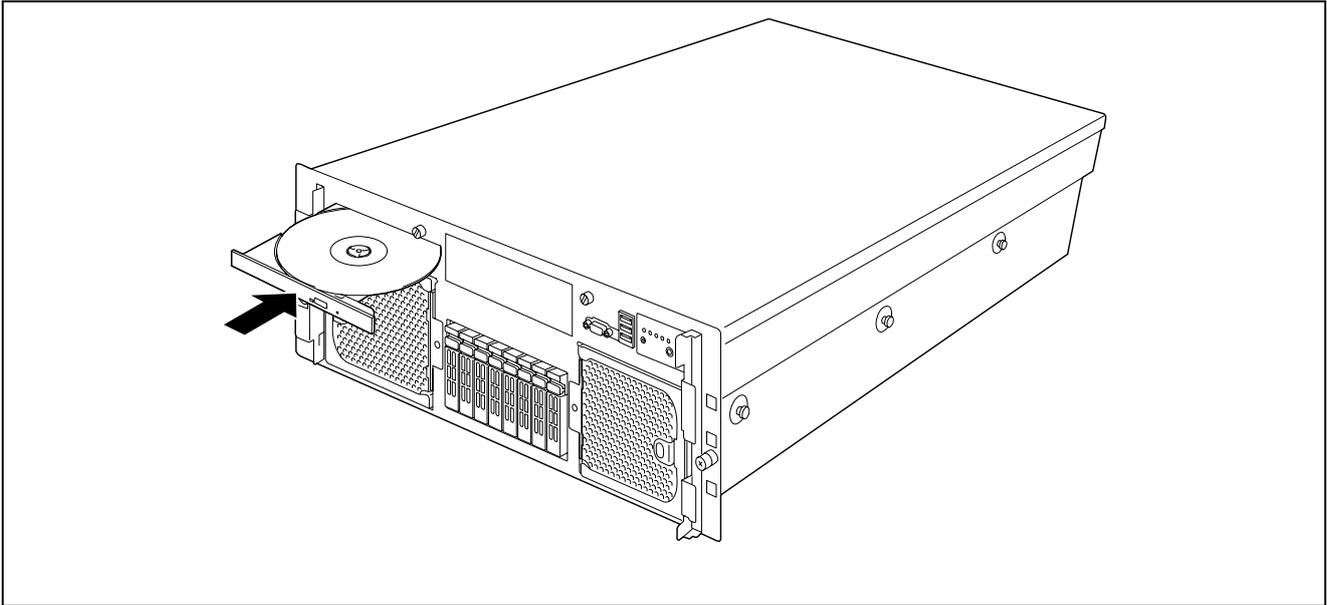
Your server is equipped with a CD-RW/DVD-ROM drive on its front to read data from a CD/DVD-ROM. The CD/DVD-ROM provides larger and faster data read than the floppy disk.

<b>⚠ CAUTION</b>	
	Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.  Do not leave the tray ejected from the CD-RW/DVD-ROM drive.

### Setting/Removing the CD/DVD-ROM

1. Confirm that the server is powered on (and the POWER/SLEEP LED lit) before setting the CD/DVD-ROM on the CD-RW/DVD-ROM drive.
2. Press the media tray eject button on the front of the CD-RW/DVD-ROM drive. The tray comes out. Put the CD/DVD-ROM on the tray carefully and securely with the label facing upward.





3. Press the CD/DVD tray eject button or push the front of the tray lightly to retract it into the drive.

---

**IMPORTANT:** If a noisy sound is emitted by the CD-RW/DVD-ROM drive after setting a CD/DVD-ROM, and set it again correctly.

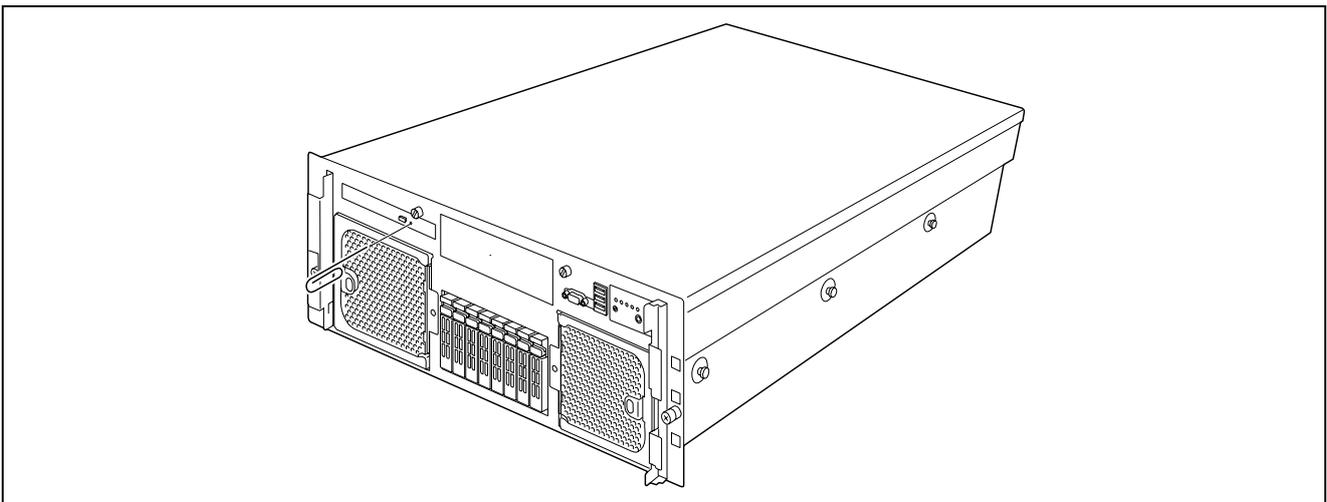
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To take out the media from the CD-RW/DVD-ROM drive, press the CD/DVD tray eject button to eject the tray. (If the access LED is lit orange, the CD/DVD-ROM is being accessed and the CD/DVD tray eject button is disabled.) Some OS have a command to eject a tray.

After taking out the CD/DVD-ROM, retract the tray into the drive.

If you fail to eject the CD/DVD-ROM tray with the CD/DVD-ROM tray eject button, follow the procedure below.

1. Press the POWER/SLEEP switch to power off the server. (The POWER/SLEEP LED goes off.)
2. Insert a metal pin of approximately 1.2 mm in diameter and 100 mm in length (a straightened large paper clip will make a substitute) into the emergency hole on the upper front of the CD-RW/DVD-ROM drive and gently push it in until the tray is ejected.



---

**IMPORTANT:**

- Do not use a toothpick or a plastic stick that could break easily.
  - If the above procedure does not let you take out the CD/DVD-ROM, contact your service representative.
- 

3. Hold the tray and pull it out.
4. Take out the CD/DVD-ROM.
5. Push the tray back into position.

---

**NOTE:** Using the CD/DVD-ROM

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

- For a disk which does not conform to the CD/DVD standard, the playback of such a disk with the DVD drive is not guaranteed.
  - Do not drop the CD/DVD-ROM.
  - Do not place anything on the CD/DVD-ROM or bend the CD/DVD-ROM.
  - Do not attach any label onto the CD/DVD-ROM.
  - Do not touch the signal side (nothing is printed on this side) with your fingers.
  - Place the CD/DVD-ROM with its printed side upward and gently put it on the tray.
  - Do not scratch the CD/DVD-ROM or write anything directly on it with a pencil or ball-point pen.
  - Do not leave the CD/DVD-ROM near foods and drinks, or in a place exposed to cigarette smoke.
  - Do not leave the CD/DVD-ROM in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).
  - When dust or fingerprints are visible on the CD/DVD-ROM, wipe the CD/DVD-ROM from its centre to the edge using a dry soft cloth slowly and gently.
  - Use the CD/DVD cleaner to clean the CD/DVD-ROM. Do not use record spray/cleaner, benzene, or thinner.
  - Keep the CD/DVD-ROM in a CD/DVD-ROM case when not using it.
  - If the CD/DVD-ROM emits a lot of noise in the CD-RW/DVD-ROM drive, remove the CD/DVD-ROM and insert it back again.
  - Do not hit the CD/DVD-ROM with the screw fixing the top cover when setting or removing the disc.
-

# Chapter 3

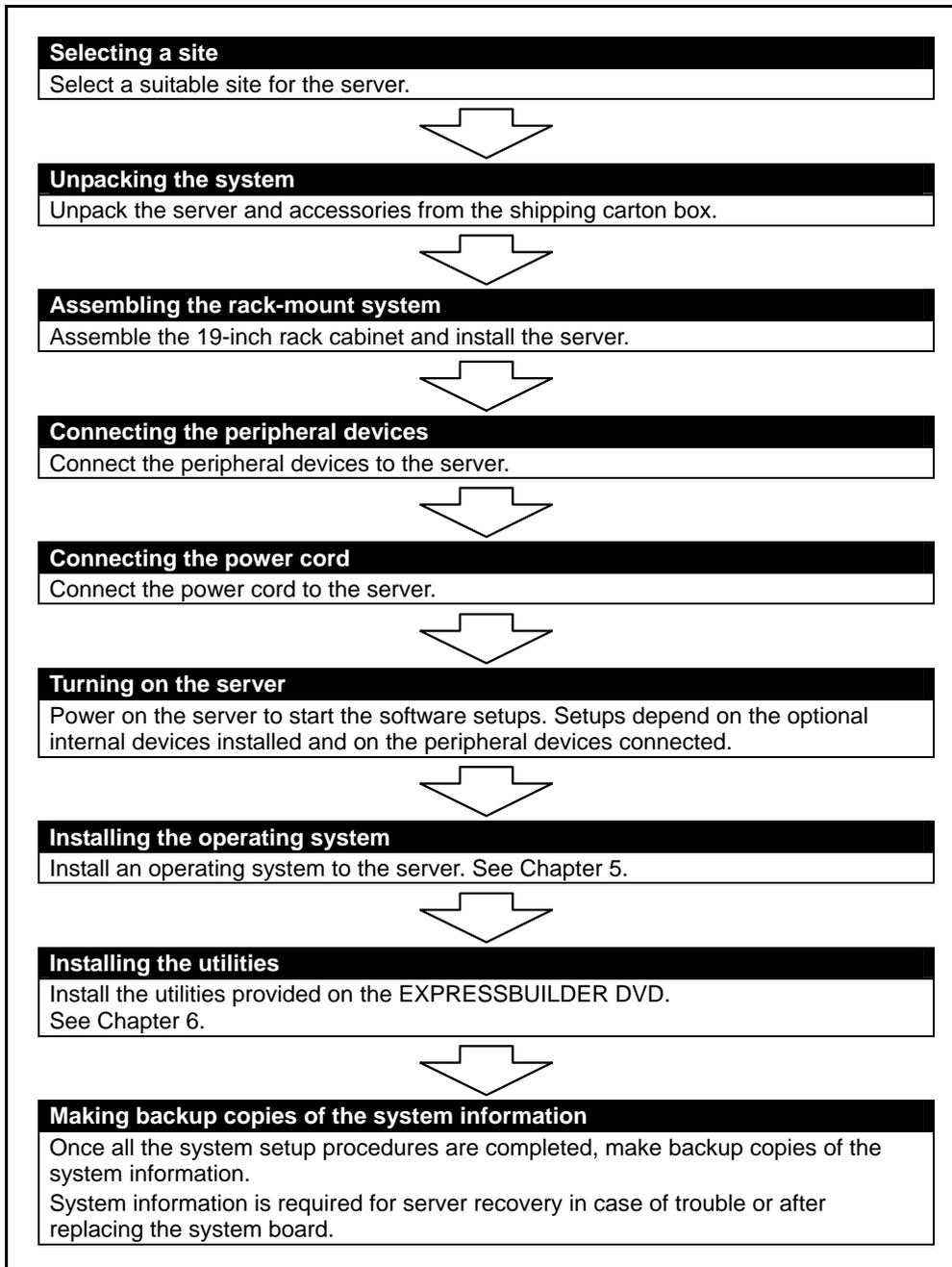
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## Setting Up Your Server

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

## SETUP FLOW

Follow the flowchart below to set up the server.



## SELECTING A SITE

Your server unit should be mounted in a standard EIA 19-inch rack cabinet.

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

 <b>WARNING</b>	
 	<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 1-3 to 1-8 for details.</p> <p>Do not use the server in any unapproved place.</p>

 <b>CAUTION</b>	
   	<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 1-3 to 1-8 for details.</p> <ul style="list-style-type: none"><li>Do not carry or install the server only by a single person.</li><li>Do not install the server in a place where the load is concentrated on a specific point.</li><li>Do not install any components in the server only by a single person.</li><li>Do not pull out a device from the rack if the rack is unstable.</li><li>Do not provide wiring exceeding the rating power.</li></ul>

---

**IMPORTANT:** Increase in temperature within the rack and air flow

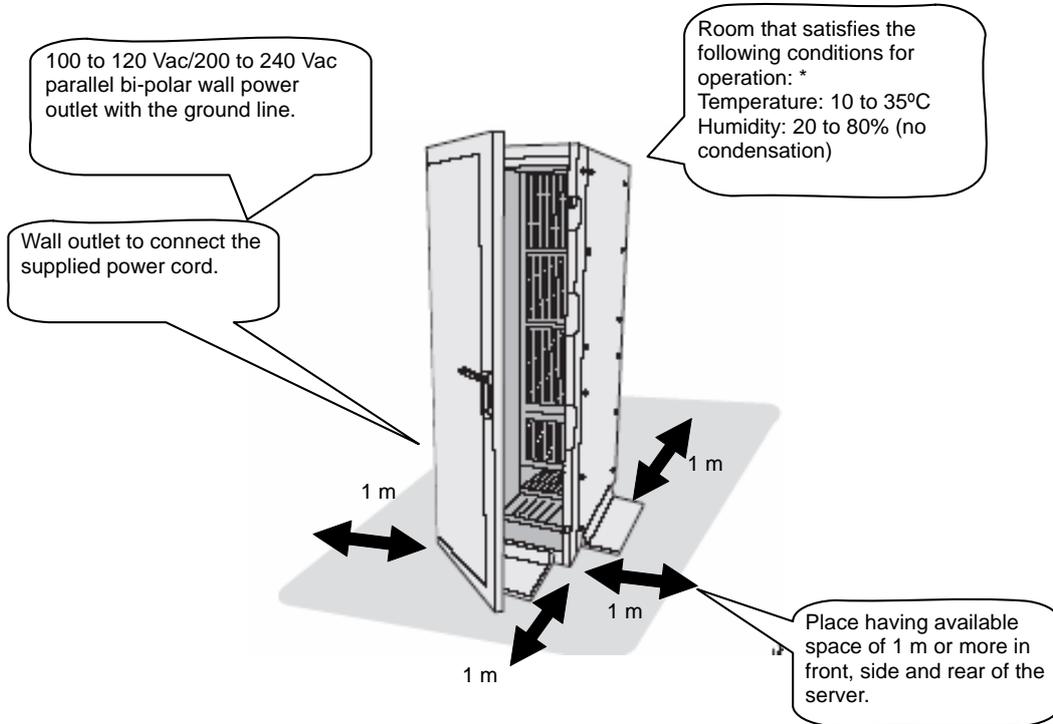
If several servers are installed in the rack or if the ventilation within the rack is not enough, the temperature in the rack may be raised by the heat generated from the units, and be higher than the operation temperature of the server (10 to 35°C).

This causes the server to operate improperly. Review the air flow within the rack or in the room and take sufficient measures in order to prevent the temperature within the rack from exceeding the warranted temperature range during the system operation.

---

The following figure illustrates a site suitable for installing the rack cabinet.

\*We recommend that the server should be used in a room where temperature is in the range between 15 to 25°C.



Do not install the rack in the places listed below. Not doing so may cause some malfunctions to occur.

Do not:

- Locate the rack in a narrow space that would prevent devices from being pulled out from the rack completely.
- Locate the rack on a floor that cannot bear the total weight of the rack and devices mounted in the rack.
- Locate the rack in a place where stabilizers cannot be installed or where the rack can be installed only after proper earthquake-resistant is constructed.
- Locate the rack on an uneven or slanting floor
- Locate the rack in an area with drastic temperature change (near a heater, air conditioner, or refrigerator).
- Locate the rack where intense vibrations may be generated.
- Locate the rack where corrosive gas may be generated (ex. vapor of sulphur), chemicals are nearby, or chemicals may be sprayed accidentally.
- Place the rack on a carpet that is not anti-static.
- Locate the rack in a place where some objects may fall on the rack.
- Locate the rack near a device that is generating intense magnetic fields (such as a TV, radio, broadcast/communication antenna, power transmission wire, and electromagnetic crane.) If unavoidable, contact your service representative to request proper shielding.)
- Locate the rack where the power cord of the server must be connected to an AC outlet that shares other devices with large power consumption.
- Locate the rack next to an 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.
- Locate the rack where the following conditions cannot be satisfied.

Operating conditions: \*

Temperature: 10 to 35°C

Humidity: 20 to 80% (no condensation)

\* We recommend using the server in a room where the ambient temperature ranges between 15 to 25°C.

\* If installed in a closed or multi-unit rack assembly, the required air flow for cooling might not be maintained, and this causes the operating ambient temperature of the rack environment to rise higher than the room ambient temperature. Therefore, consideration should be given to installing the server in an environment compatible with the rated ambient temperature (10 to 35°C) and appropriate air flow.

---

## Installing or Removing the Server into/from the Rack

This subsection provides the instructions necessary to install the rack-mount server unit into a standard EIA 19-inch rack cabinet.

This subsection also describes the removal procedure for the rack mount server unit from the 19-inch rack cabinet.

### WARNING



Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

Do not use any rack which does not conform to the relevant standard.  
Disconnect the power cord(s) before installing or removing the server.

### CAUTION

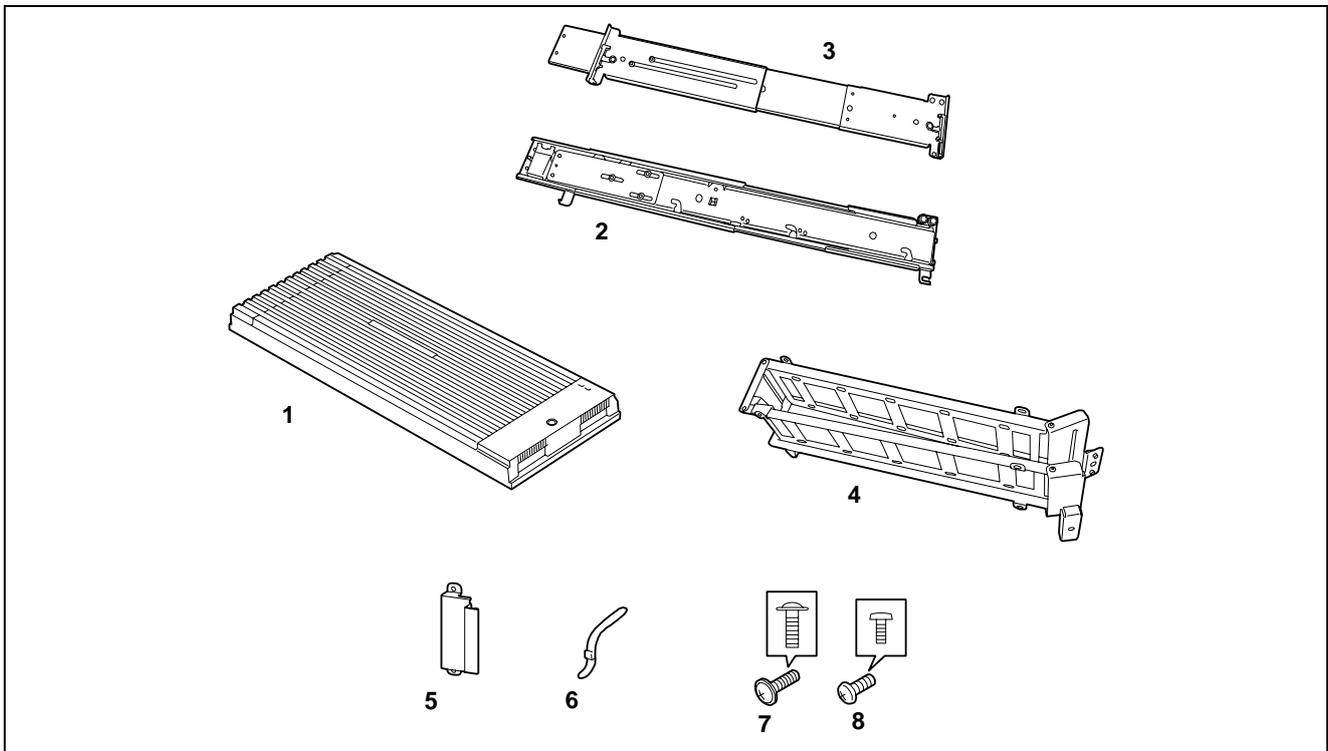


Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

Do not pull out more than one device at a time from the rack.  
Do not lift the server only by a single person.  
Always install the server in the specified place.  
Do not install the server without its cover in the rack.  
Do not pinch your finger with mechanical components.

## Checking Components

Confirm that the following tools or components are provided before attempting the installation.



No.	Item	Q'ty	Remarks
1	Front bezel	1	
2	Slide rail assembly (L)	1	"L" is stamped on the rail.
3	Slide rail assembly (R)	1	"R" is stamped on the rail.
4	Cable arm	1	
5	Arm stopper	1	
6	Tie-wrap	10	25 cm long.
7	Screw (A)	4	Two are for spare.
8	Screw (B)	2	

## Required Tools

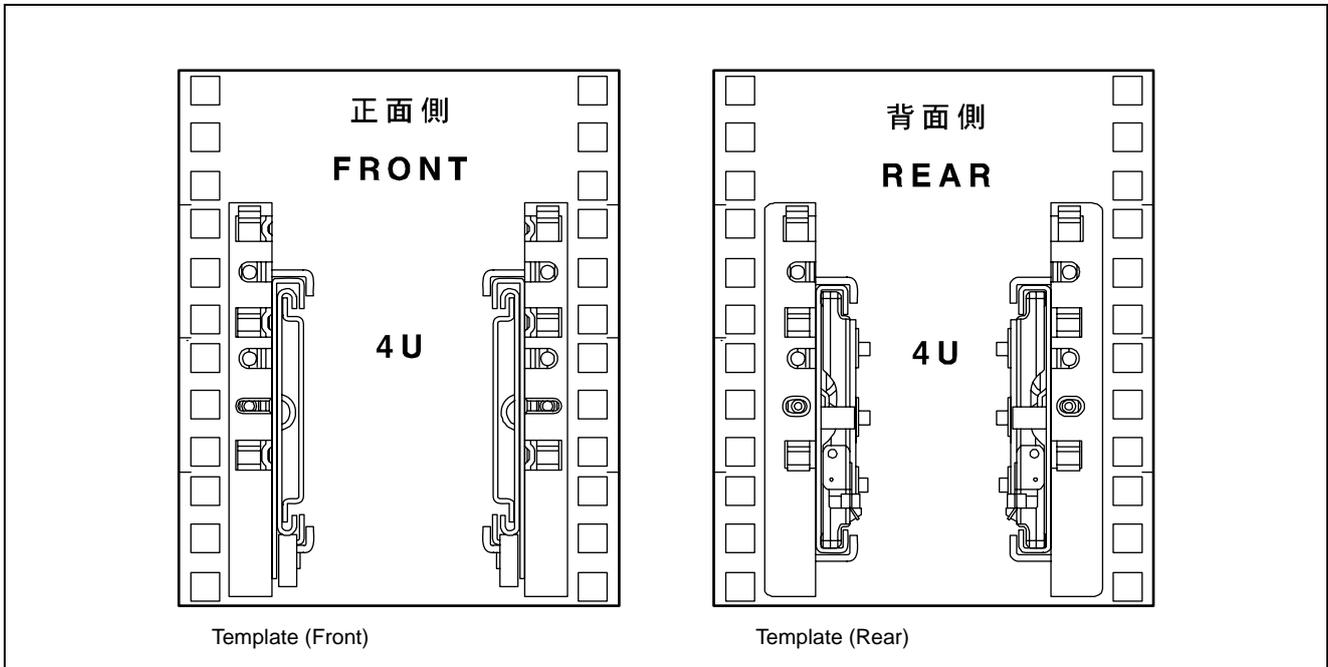
A #2 Phillips screwdriver and flat tip screwdriver are recommended for assembling the rack-mount system.

## Installation Procedure

Install the server on the rack as described in the following procedure.

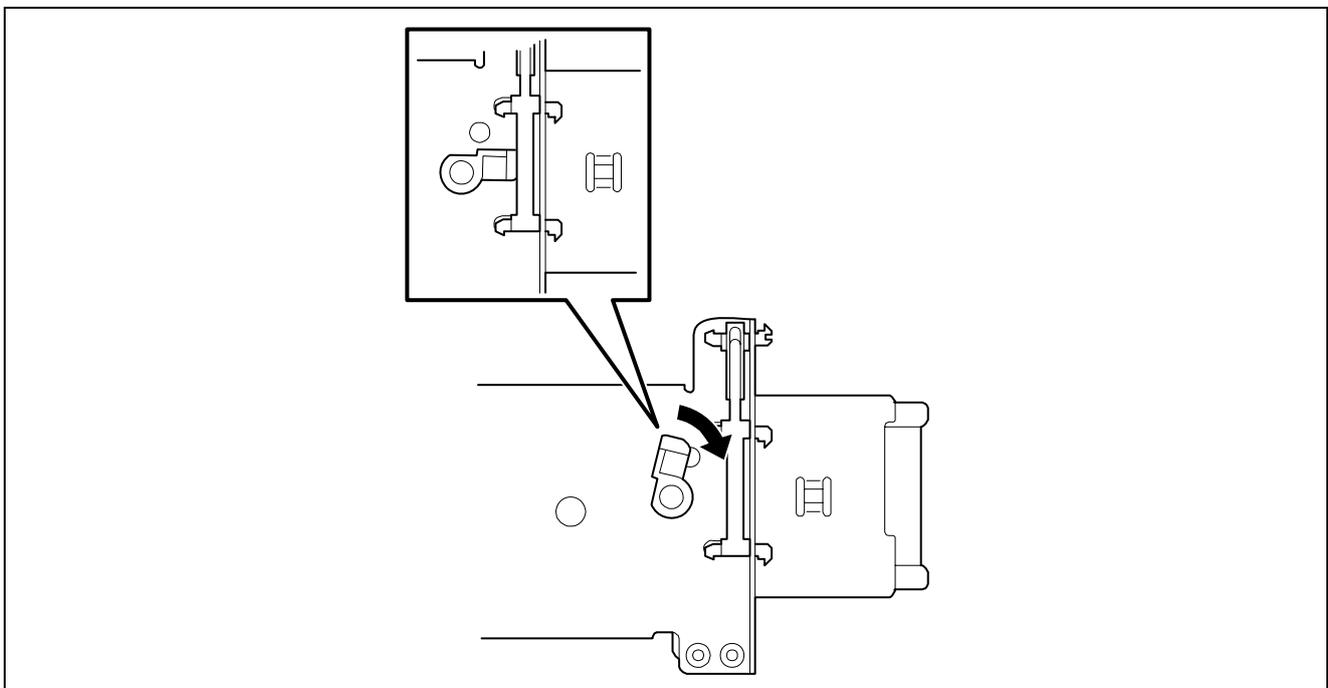
1. Define the position (height) at which the server is to be installed.

The server is 4U high. The bottom of the rail aligns with the bottom of server.



2. Make sure that the black lever surely locks the components.

If not, lock them.



**NOTE:** There are four levers to secure the components. Lock all four levers securely.

3. Define the position of the slide rail assembly so that the bottom of the rail bracket is located at the lower position of the server.

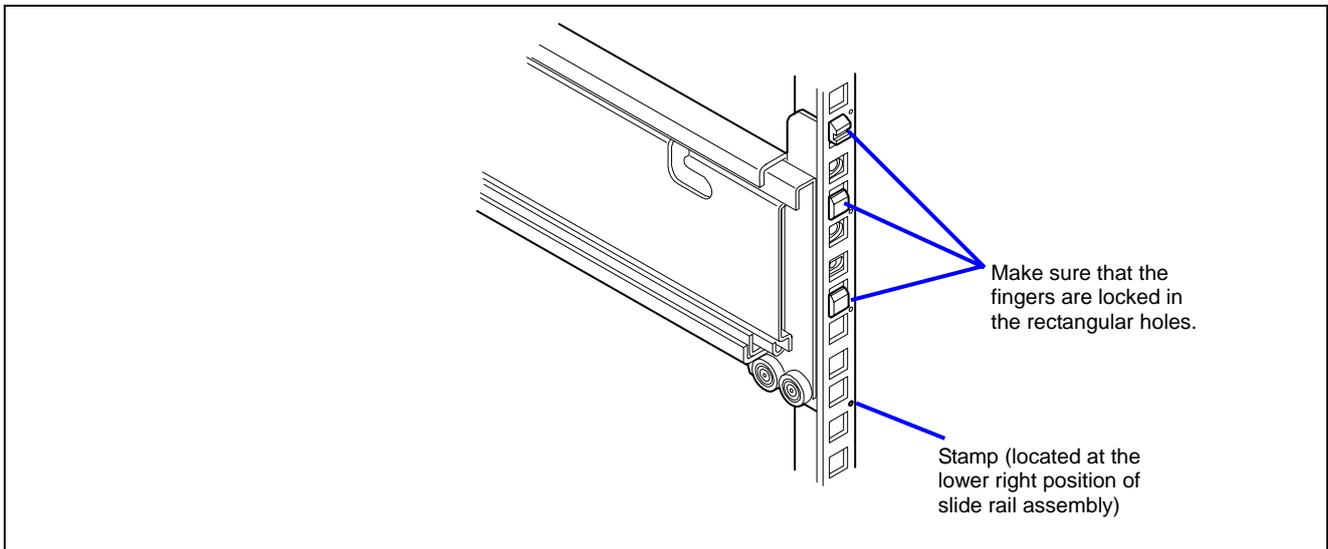
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**IMPORTANT:** If the slide rail is inclined during installation, inner fails may protrude.

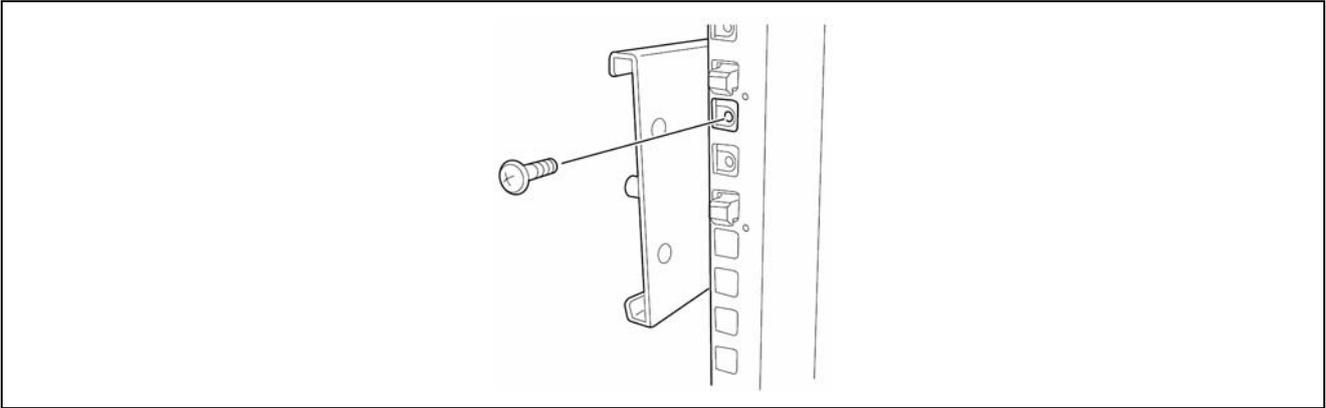
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**NOTES:**

- Check the direction of the slide rail assembly.
    - Make the bracket face the outside of the rack.
    - The slide rail has different shapes in its left and right side. Refer to the stamp on the rail (Front → L / Front → R).
  - The front and rear supports of the rack have rectangular holes for screw fastening. For the NEC rack, round stamps are provided in 1U. As shown in the figure, a stamp must be positioned at the tip of slide rail assembly (lower side).
  - The rail bracket is 3U high.
  - Make sure that the fingers are locked in the rectangular holes.
- 



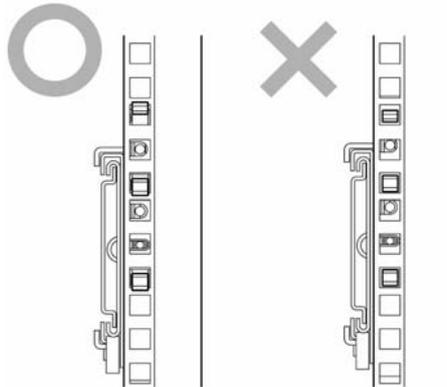
4. Secure the left and right sides of the slide rail assembly (for the rear side of the rack), with two screws (A).



---

**NOTES:**

- Make sure that the frame tips on the slide rail assembly are squarely aligned with the rectangular hole frames of the rack and that the four screw holes of the rail can be seen through the mating rectangular holes of the rack.



- Check that the slide rail assembly is level.
- 

5. Install the other slide rail assembly on the opposite side of the rack as described in steps 2 to 4 above.

---

**NOTE:** Make sure that the slide rail assembly is installed at the same level than the slide rail assembly installed first.

---

6. Hold the server by three or more persons to mount it on the rack.

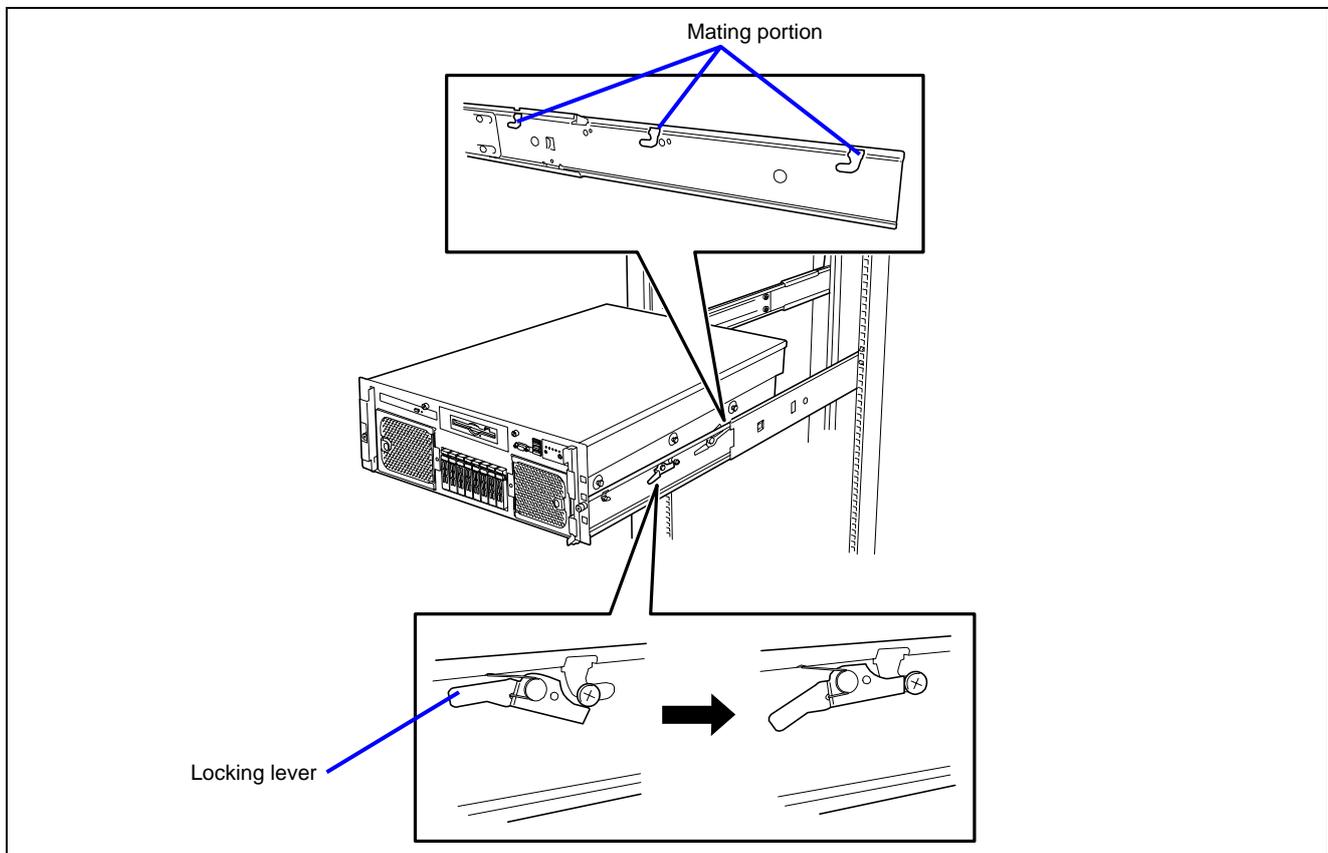
<b>⚠ CAUTION</b>	
	<p>Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.</p> <p>Do not lift the server only by two or less persons. Do not pinch your fingers with the mechanical components. Do not use your fingers to push the release lever.</p>

Pull the inner rail, and install it so that its cutout engages with the projection on the side of the server.

---

**IMPORTANT:** The center cutout has locking mechanism. Make sure that it is surely locked.

---



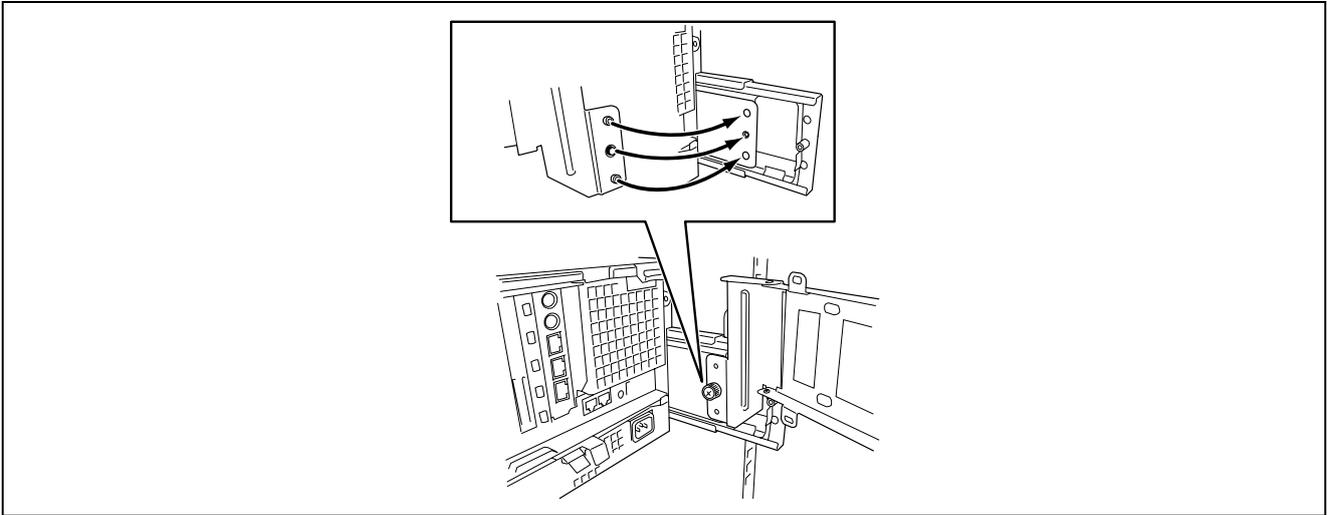
During the first installation, you may feel strong friction when pushing because the mechanical components cannot be completely engaged with each other. Force the way in.

7. Install the cable arm to the inner rail (to the right side viewed from rear of the server).

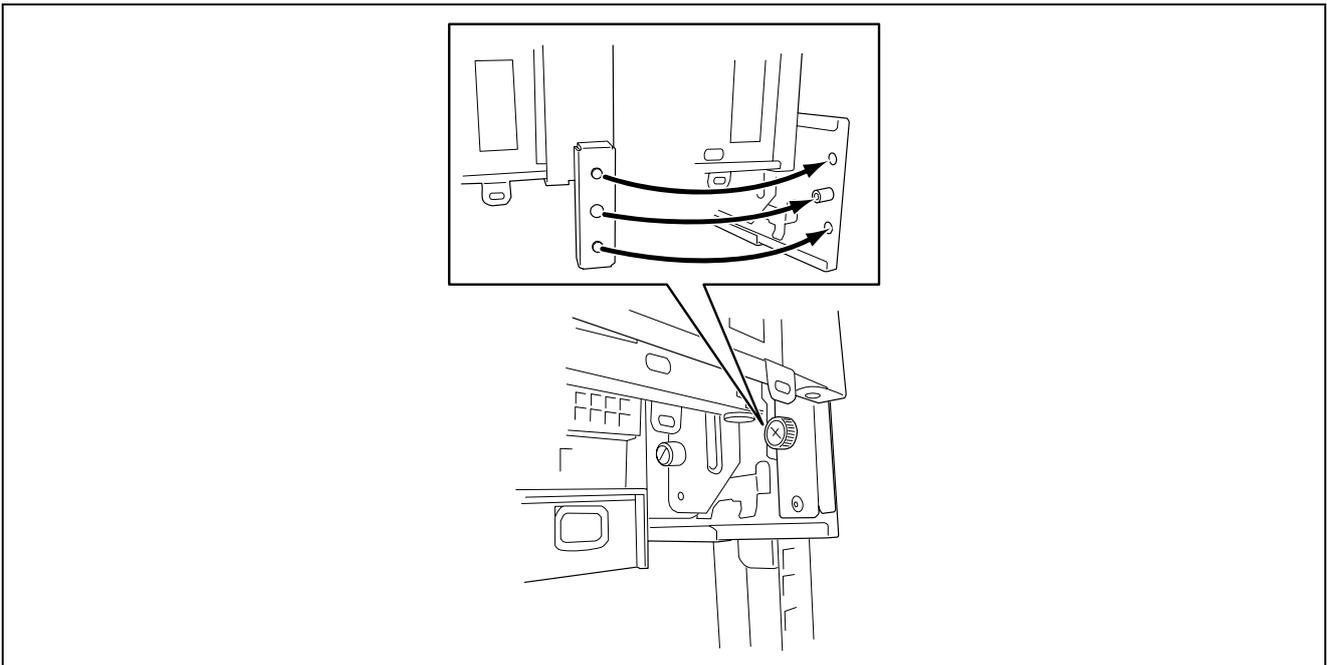
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**NOTE:** Install the cable arm so that its protrusions align with holes on the inner rail.

---

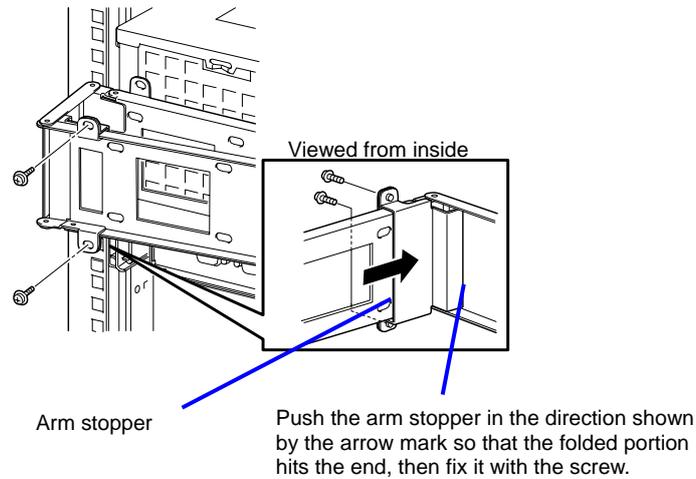


8. Install the other side of the cable arm to the outer rail.



---

**NOTE:** When installing the server into an NEC rack, fix the arm stopper to the slide rail assembly with screw (B).



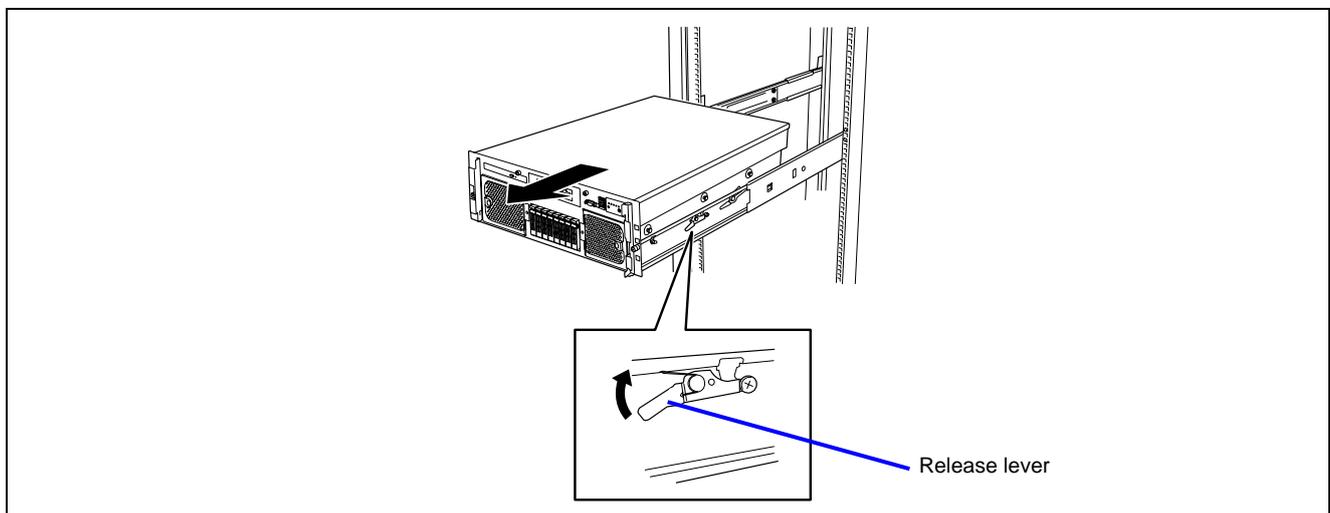
- 
9. Push the server into the rack once to check the installation position.

To push the server into the rack, lift the green release levers at both sides of the rail (using a screw driver) to unlatch the server. Make sure your fingers do not get caught in the process.

---

**IMPORTANT:**

- Push each release lever using a screwdriver or a similar tool. Pushing a release lever with your fingers may cause serious injuries.
- Two release levers are provided on each side of the rail. Release only the green levers.



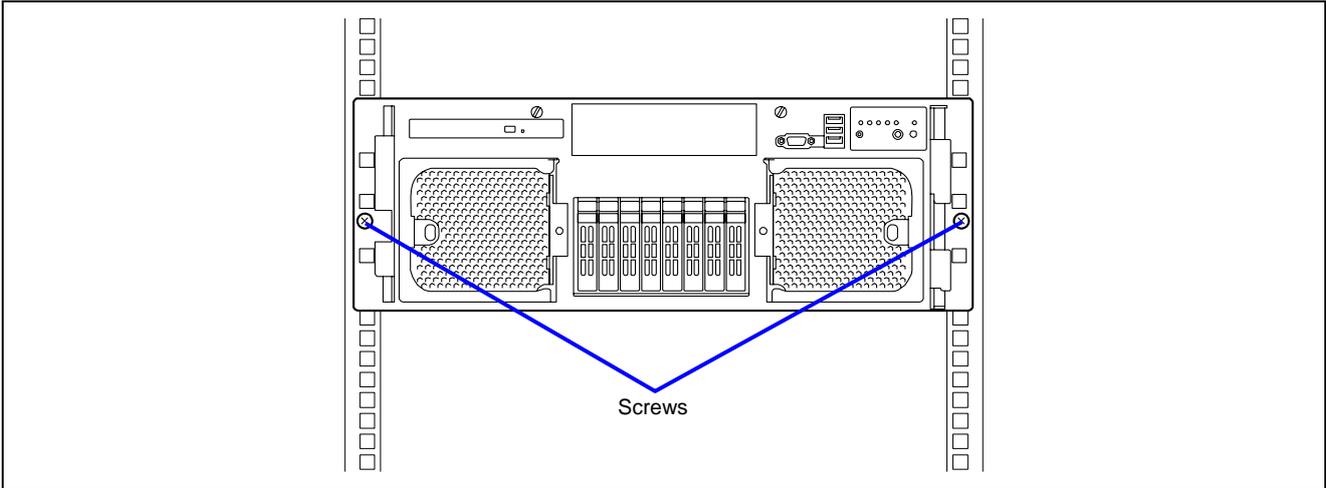
10. Pull out or push the server into the rack several times to confirm that it slides smoothly.
11. Connect the power cord and interface cables.

---

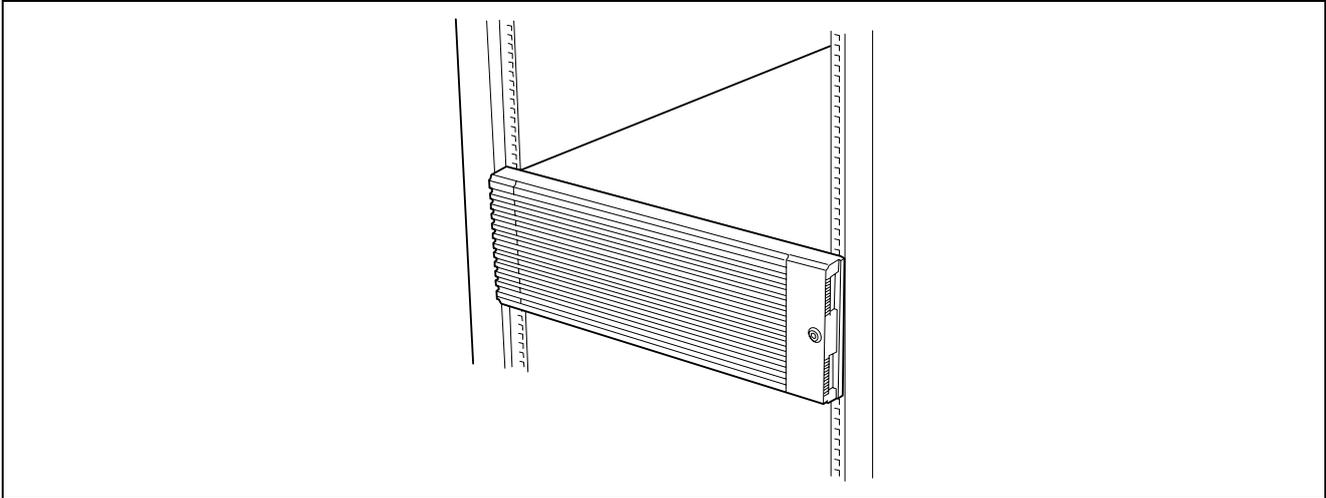
**NOTE:** Before connecting the cables, be sure to read the precautions given in "Connecting Peripheral Devices".

---

12. Secure the server to the rack using two thumb nuts.



**13.** Install the front bezel.



The installation is completed.

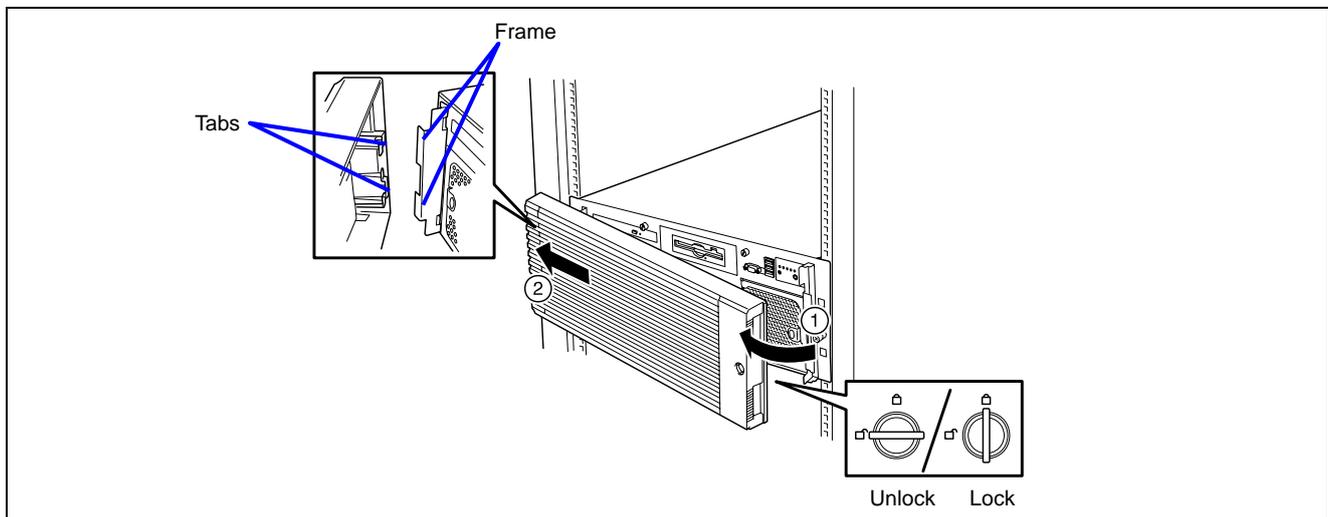
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## Removal Procedure

Do not remove the server from the rack by yourself.

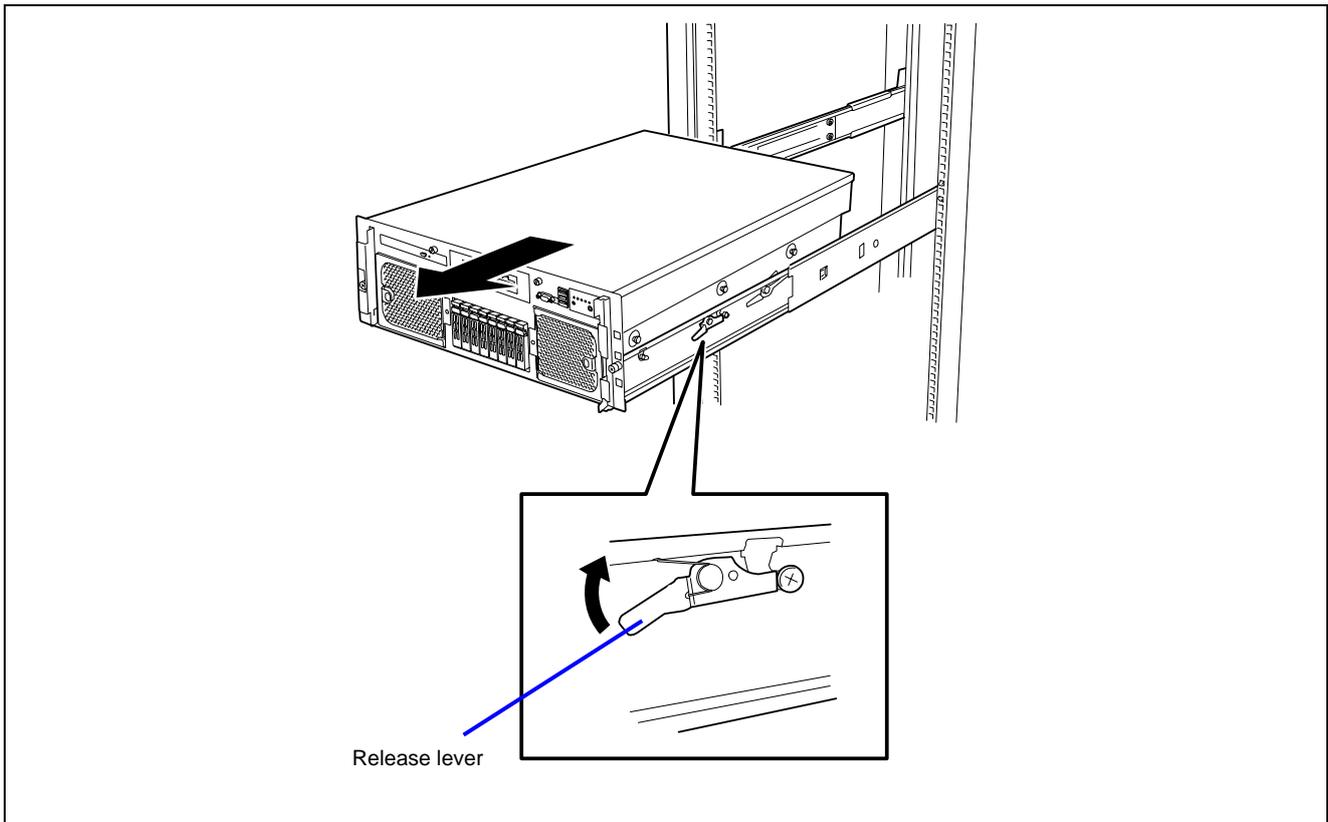
<b>⚠ CAUTION</b>	
	<p>Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.</p> <ul style="list-style-type: none"><li>Do not lift the server only by two or less persons.</li><li>Do not pinch your finger with mechanical components.</li><li>Parts of the server may be hot.</li><li>Do not pull out a device from the rack if the rack is unstable.</li><li>Do not pull out more than one device at a time from the rack.</li></ul>

1. Make sure that the server is powered off, and remove the power cords and all interface cables from the server.
2. Release the security lock and remove the front bezel.



3. Remove the two screws (A) located on both sides of the front face of the server.
4. Hold the handle to pull out the server from the rack slowly and carefully. The latches click.

5. Push the left and right release levers to release the lock and then pull out the server from the rail slowly.



---

**IMPORTANT:**

- Push each release lever using a screwdriver or a similar tool. Do not use your fingers, which could get caught, causing severe injuries.
  - Pull out the server slowly with its bottom supported by more than one person.
- 

See the "Installation procedure" to remove the rack-mount kit from the rack.

## CONNECTING PERIPHERAL DEVICES

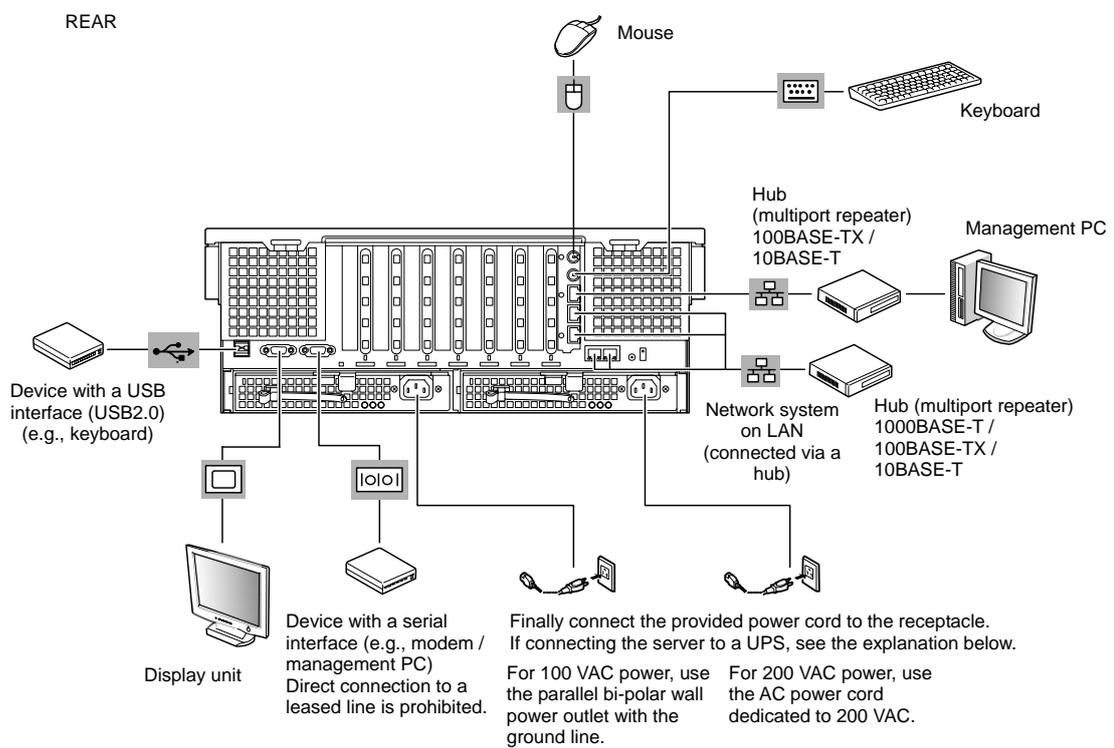
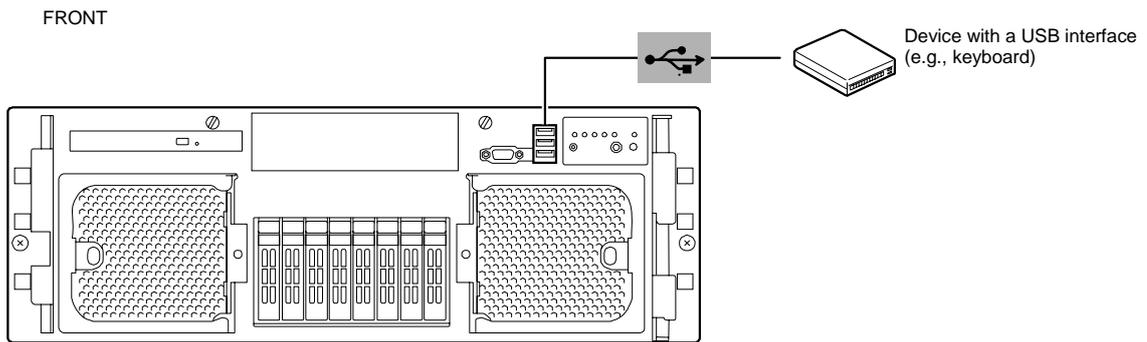
Connect peripheral devices to the server. The server is provided with connectors for wide variety of peripheral devices on its front and rear. The figure on the next page illustrates the available peripheral devices for the server in the standard configuration and the locations of the connectors for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

<b>⚠ CAUTION</b>	
	<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 1-3 to 1-8 for details.</p> <ul style="list-style-type: none"><li>Do not connect any interface cable with the power cord of the server plugged to a power source.</li><li>Do not use any unauthorized interface cable.</li></ul>

---

### IMPORTANT:

- Power off the server and a peripheral device before connecting them. Connecting a powered peripheral device to the powered server will cause malfunctions and failures (not applicable to USB devices).
  - To connect a third-party peripheral device or interface cable to the server, consult with your service representative for the compatibility of such a device or cable. Some third-party devices must not be used with this server.
  - Plug in the keyboard and mouse with "Δ" on the connector upward.
  - A leased line cannot be connected directly to the serial port connectors.
  - Secure the power cord(s) and interface cables with a lock spring or the tie-wrap attached to the power supply unit.
  - Form the power cord leaving some slight slack around the AC inlet of the server. This prevents the cord from coming off when the server is pulled out.
  - Confirm that no pressure is applied to the power cord plug.
  - Be sure to use the cable for 200 VAC (optional), if you use the server with 200 VAC power. The AC power cord provided with the server accepts 100 VAC only. Do not use the cord with 200-VAC power.
  - Guide the cables in such a way that they will not come into contact with the door or the guide rails on the sides of the server.
-



## CONNECTING THE POWER CORD

Connect the provided power cord to the server.

### WARNING



Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

Do not hold the power plug with a wet hand.

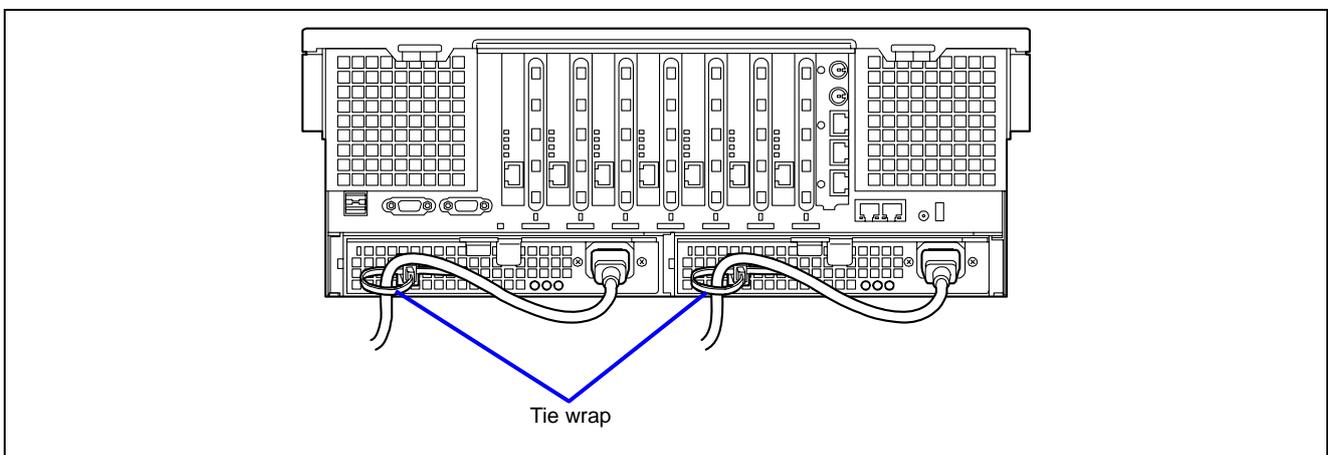
### CAUTION



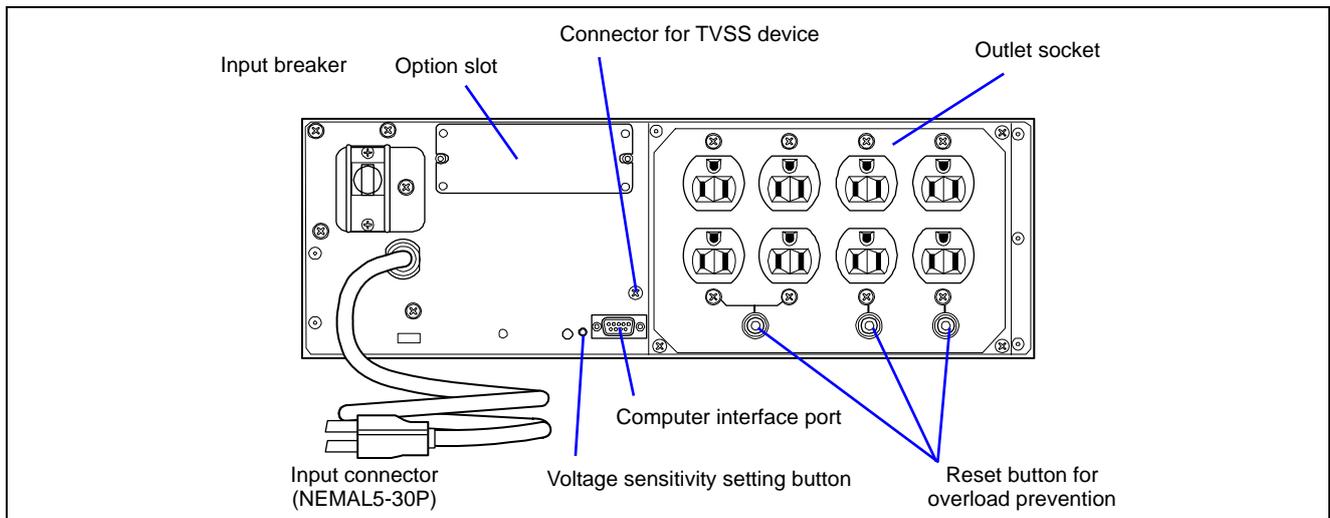
Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

Do not plug the power cord into an improper power source.  
Do not connect the power cord to an outlet on which other devices are already connected.  
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 AC inlet on the rear of the server.
2. Plug the other end of the power cord into the wall outlet.
3. Secure the power cord with a tie wrap.



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



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

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

## TURNING ON THE SERVER

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

---

**IMPORTANT:** Before turning on the server:

- Some optional boards require additional setup with the SETUP utility before installation. If the server has a PCI board with the PCI-to-PCI bridge installed, the SETUP utility cannot be started. Check the board specifications to find out whether it requires pre-installation setups before actually installing the board.
- Some installed optional devices or connected peripheral devices require setups before proceeding to the next step.

To use the server with no optional devices installed besides the graphic board, install the desired OS to the server.

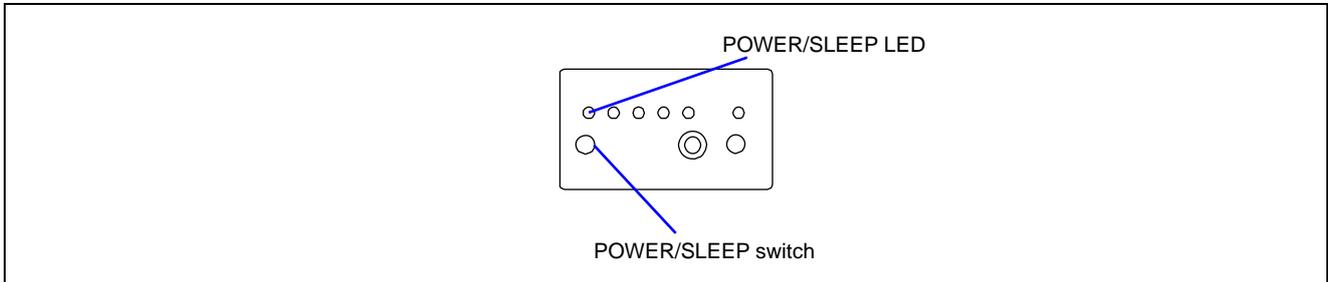
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1. Make sure that the floppy disk drive contains no floppy disk and that the CD-RW/DVD-ROM drive contains no bootable CD/DVD-ROM.
2. Press the POWER/SLEEP switch.

---

### NOTES:

- If the power cord is connected to a power control unit such as a UPS, turn on the power control unit.
  - Connect the power cord and wait for about 30 seconds before pressing the POWER/SLEEP switch to allow the BMC (Baseboard Management Controller) firmware start-up.
- 



The POWER/SLEEP LED on the front of the server lights up.

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

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

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

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

---

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

---

During the POST, messages prompting you to launch the BIOS SETUP utility stored in ROM on system board or on an installed option board will be displayed.

Start the BIOS SETUP utility corresponding to your system environment to change the BIOS setup.

- For more information on the BIOS SETUP of the server, see Chapter 4.
- For more information on the BIOS SETUP of the option board, refer to the manual that comes with the option board.

## INSTALLING THE OPERATING SYSTEM

See Chapter 5 for more information on the Operating system installation.

---

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

---

## INSTALLING THE UTILITIES

Install the utilities included with the server. See Chapter 6 for details.

## MAKING BACKUP COPIES OF THE SYSTEM INFORMATION

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

We recommend you save the information after completing the system setup. Note that without the backup data, you will not be able to recover the information.

You can save the information as described in the following process.

1. Insert the EXPRESSBUILDER DVD into the CD-RW/DVD-ROM drive and reboot the system.
2. Select [Maintenance Tools (Normal mode)].
3. Select [English].
4. Select [Maintenance Utility].
5. Select [System Information Management].
6. Insert a floppy disk into the floppy disk drive.
7. Select [Save].

# Chapter 4

---

## Configuring Your Server

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

When you install the server for the first time or install/remove optional devices, thoroughly read this chapter for a better understanding of the settings.

### SYSTEM BIOS ~ SETUP ~

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

The server is factory-configured with the correct parameters using the SETUP utility. Only 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 the system parameters of the SETUP utility. With the User password, system parameters available for viewing and changing are limited.
  - Do not set any password before installing the OS.
  - The server contains the latest version of the SETUP utility. Dialog boxes appearing on your SETUP utility, may thus differ from the descriptions in this manual. If you find anything unclear, see the online help or ask your service representative.
-

---

## Starting the SETUP Utility

To run the SETUP utility, perform the following procedures:

1. Turn on the power of the server.

A full-screen logo appears on the screen (the POST screen may appear instead, depending on the corresponding BIOS setting).

After a while, one of the following messages appears at the bottom of the screen.

Pattern 1:

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

Pattern 2:

Press <F1> to resume, <F2> to enter Setup, <F12> to Network

\* The displayed message varies depending on the device status.

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

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

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

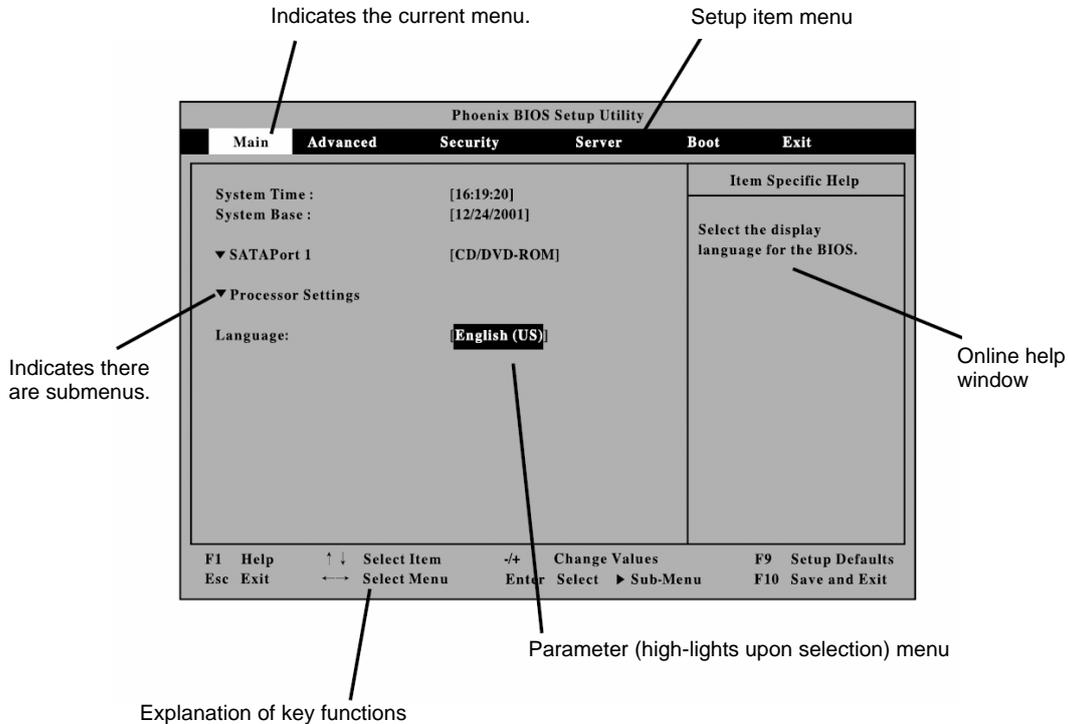
---

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

---

## Description on On-Screen Items and Key Usage

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



- Cursor** (↑, ↓): Selects an item on the screen. The highlighted item is currently selected.
- Cursor** (←, →): Selects the Main, Advanced, Security, System Hardware, Boot, or Exit menu.
- and +:** Changes the value (parameter) of the selected item. When a submenu option (an option preceded by "\*") is selected, these keys are disabled.
- Enter**: Press **Enter** to select (determine) parameters.
- Esc**: Displays the previous screen.
- F1:** Press **F1** when you need help on SETUP operations. The help screen for the SETUP operations appears. Press **Esc** to return to the previous screen.
- F9:** Sets the parameter of the currently displayed item back to the factory set parameter.
- F10:** Sets the parameter back to the one stored by the server before the SETUP utility was started.

---

## Configuration Examples

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

### Link with Management Software

To link with the temperature monitoring feature of NEC ESMPRO Agent

Select [Server] - [Thermal Sensor] - [Enabled].

To control the power supply of the server with NEC ESMPRO Manager via the network

Select [Advanced] - [Advanced Chipset Control] - [Wake On Lan/PME] - [Enabled].

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

---

#### NOTES:

- [Wake On Lan/PME] feature is supported by the onboard LAN controller (1000Base-T/100Base-Tx).
  - Immediately after AC power is turned on, the [Wake On Lan/PME] feature is enabled regardless of the BIOS settings.
- 

### UPS

To link power supply with the UPS

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

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

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

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

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

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

### Boot

To change the boot order of the devices connected to the server

Select [Boot] and specify the boot order.

To display the POST check results

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

You can also press **Esc** while the full-screen logo is displayed to switch to the POST check results.

To control from the HW console

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

## Memory

To enable the memory degradation feature

Select [Advanced] - [Memory/Processor Error] - [Halt].

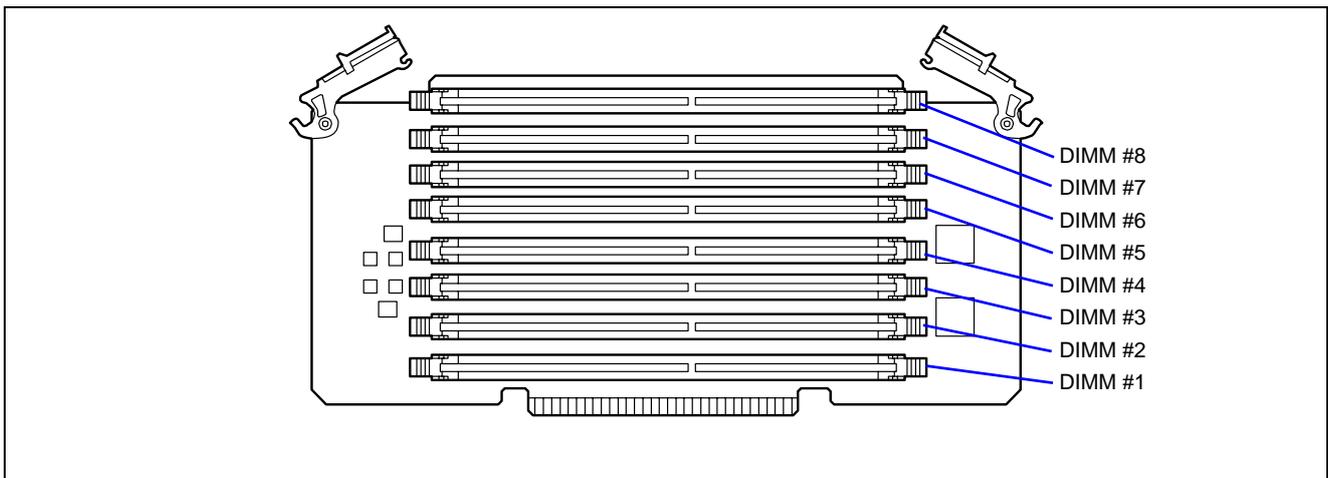
To check the installed memory (DIMM board) status

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

The on-screen DIMM socket locations and on the memory 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.



To enable the memory mirroring feature

Select [Advanced] - [Memory Configuration] - [Memory RAS Feature], and select [Mirror].

## Processor

To enable the processor degradation feature

Select [Advanced] - [Memory/Processor Error] - [Halt].

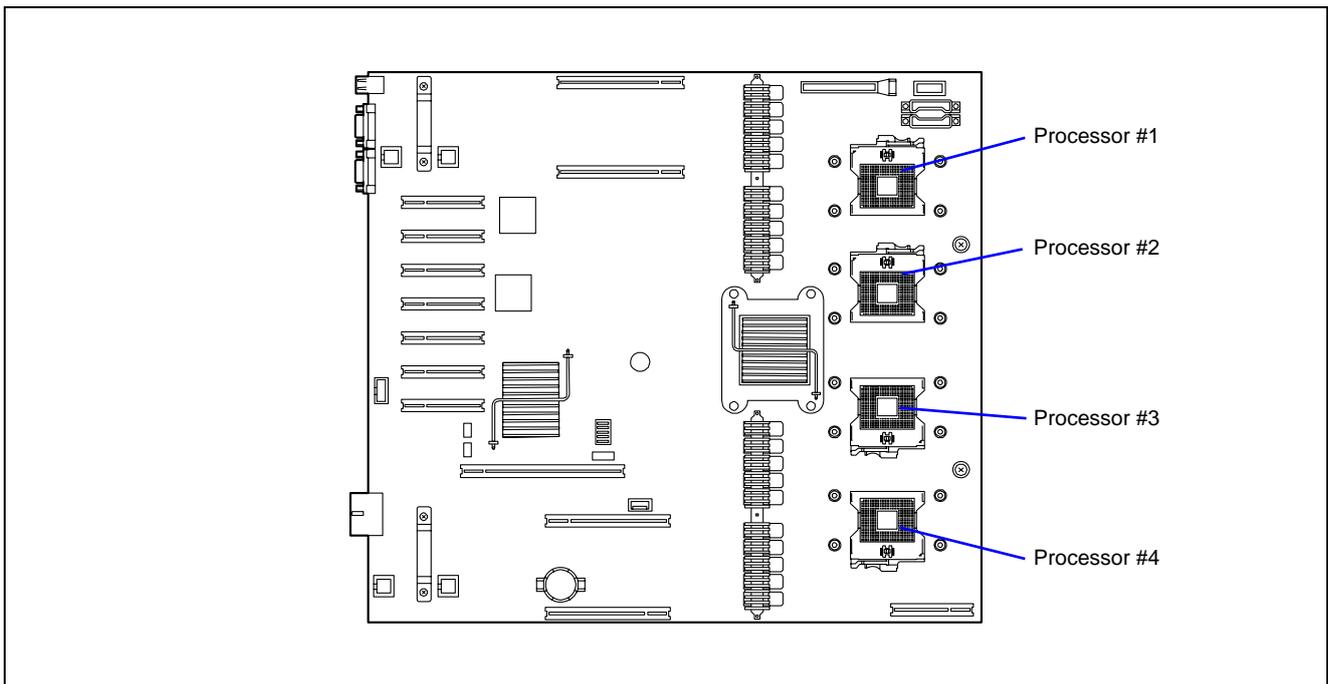
To check the installed processor status

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

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

To clear the processor error information

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



## Security

To set BIOS passwords

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

The Supervisor password and User password can be set separately, and only the User password is restricted when accessing the SETUP utility.

To enable/disable the POWER/SLEEP switch and SLEEP switch

- Disabling

Select [Security] - [Power Switch Inhibit] - [Enabled].

- Enabling

Select [Security] - [Power Switch Inhibit] - [Disabled].

---

**IMPORTANT:** Enabling [Power Switch Inhibit] disables the forced shutdown (see Chapter 8) as well as the possibility to power on/off using the POWER switch.

---

## External Devices

To set up external devices

Select [Advanced] - [Peripheral Configuration] and set up each device.

## Internal Devices

To set up internal PCI devices

Select [Advanced] - [PCI Configuration] and set up each device.

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

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

## PCI Hot Plug

To install the PCI board with the PCI hot plug

Select [Advanced] - [PCI Configuration] - [Hot Plug PCI Control] - [Minimum/Middle/Maximum\*]

\* The setting varies depending on the PCI board. See the table below.

Board name	Setting Value
1000Base-T Adapter (2ch)	Minimum
1000Base-T Adapter	Minimum

## Saving the Configuration Data

To save the BIOS configuration data

Select [Exit] - [Exit Saving Changes] or [Save Changes].

To discard changes to the BIOS configuration data

Select [Exit] - [Exit Discarding Changes] or [Discard Changes].

To resume the default BIOS configuration data (may differ from factory-set value)

Select [Exit] - [Load Setup Defaults].

To save the current value as user defaults

Select [Exit] - [Save Custom Defaults].

To load the user-defined defaults

Select [Exit] - [Load Custom Defaults].

## Menus and Parameters Descriptions

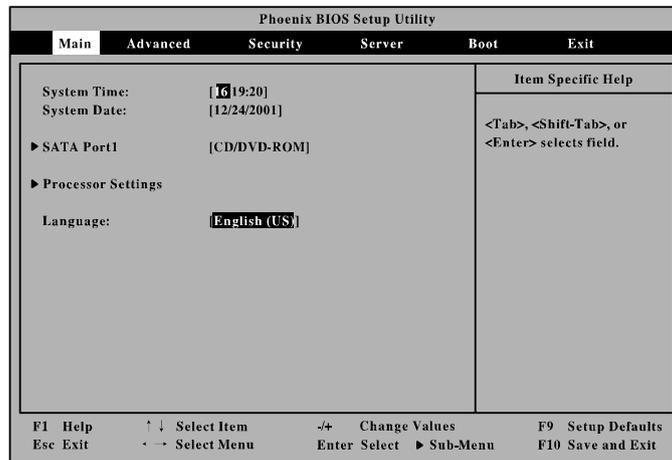
The SETUP utility includes the following six major menus:

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

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

### Main

After entering SETUP, the Main menu appears first. To display a submenu, position the cursor on a selection that includes a submenu (preceded by symbol **\***) and press **Enter**.



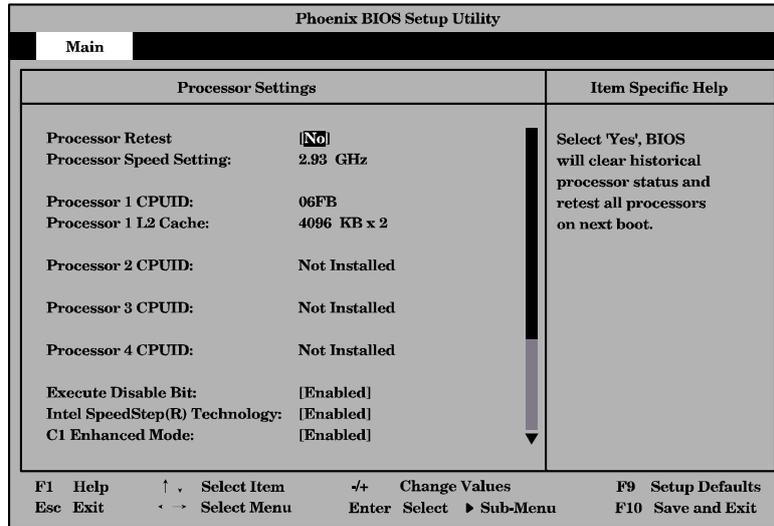
The items which can be set on the Main menu screen and their functions are described below.

Option	Parameter	Description	Your Setting
System Time	HH:MM:SS	Sets the time.	
System Date	MM/DD/YYYY	Sets the date.	
SATA Port 1	–	Displays the information on the device connected to the channel on the submenu. (Display only)	
Language	[English (US)] French German Spanish Italian	Select the language used for SETUP.	

[ ]: Factory-set

## Processor Settings

Selecting "Processor Settings" on the Main menu shows the following submenu.



See the table below for the items.

Option	Parameter	Description	Your Setting
Processor Retest	[No] Yes	Clears the error information on the processor.	
Processor Speed Setting	–	Indicates the frequency of the processor.	
Processor 1-4 CPUID	–	A numeral indicates the ID of processor. "Disabled" indicates that the BMC has identified the CPU as being defective. "Not Installed" indicates that the processor is not installed. (Display only)	
Processor 1-4 L2 Cache	–	Indicates the L2 cache of the processor.	
Execute Disable Bit	[Enabled] Disabled	Disables or enables the Execute Disable Bit of the processor.	
Intel SpeedStep(R) Technology	Disabled [Enabled]	Disables or enables the enhanced Speed Step technology of Intel processor. This menu appears only when the processor supports this feature.	
C1 Enhanced Mode	Disabled [Enabled]	Disables or enables the Enhanced Halt State (C1E) feature of Intel processor. This menu appears only when the processor supports this feature.	

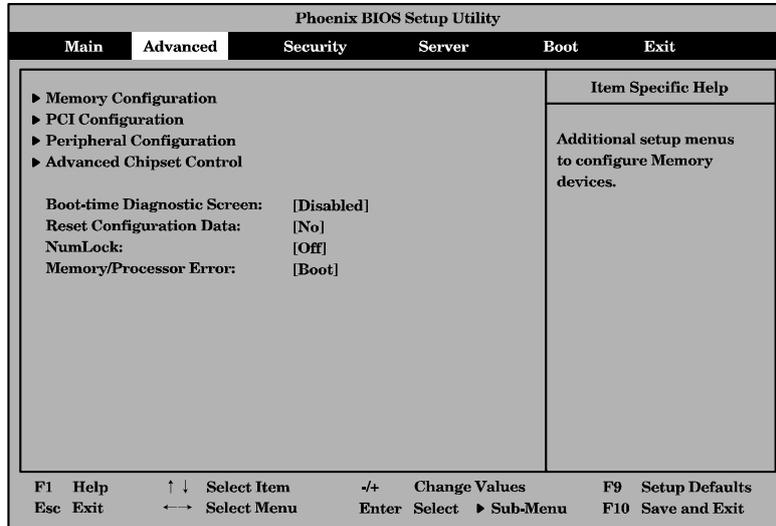
Option	Parameter	Description	Your Setting
Virtualization Technology	[Enabled] Disabled	This menu appears only when the processor supports Intel® Virtualization Technology. Specify whether the Intel® Virtualization Technology is enabled or disabled. If the parameter is changed, the DC power of the system must be turned off. Select [Exit] → [Exit Saving Changes] and restart the system. Then, turn off the DC power on the POST screen.	
Hardware Prefetcher	[Enabled] Disabled	Disables or enables the Hardware Prefetcher of the processor.	
Adjacent Cache Line Prefetch	[Disabled] Enabled	Disables or enables the Adjacent Cache Line Prefetch of the processor.	

[ ]: Factory-set

## Advanced

The Advanced menu appears if you move the cursor to "Advanced."

To display a submenu, position the cursor on a selection that has a submenu (preceded by symbol **\***) and press **Enter**.



See the table below for the items.

Option	Parameter	Description	Your Setting
Boot-time Diagnostic Screen	[Disabled] Enabled	Specifies whether the self-diagnosis (POST) running screen is displayed during boot. If this item is set to "Disabled," a full-screen logo appears during POST. (Pressing <b>Esc</b> at that time displays the POST execution screen). The Boot-time Diagnostic Screen is automatically enabled if the Console Redirection is enabled.	
Reset Configuration Data	[No] Yes	Select "Yes" to clear the extended system configuration data area (system information stored by POST). The parameter is automatically changed to "No" after the system has booted.	
NumLock	On [Off]	Specifies whether the numlock is enabled or disabled at boot.	
Memory/Processor Error	[Boot] Halt	Indicates whether the POST stops at the occurrence of a processor or memory error during the execution of POST. When a processor error or memory error is encountered, the utility does not stop if this item is set to "Halt", even when the "POST Error Pause" of the "Server" menu is "Enabled".	

[ ]: Factory-set

## Memory Configuration

Selecting "Memory Configuration" on the Advanced menu displays the following screen.

Phoenix BIOS Setup Utility		
Advanced		
Memory Configuration	Item Specific Help	
Installed memory	8192MB	Clear the memory error status.
Available under 4GB	3328MB	
▶ Memory Riser Board A		
▶ Memory Riser Board B		
▶ Memory Riser Board C		
▶ Memory Riser Board D		
Memory Retest	[No]	
Extended RAM Step	[Disabled]	
Online Spare Memory	[Disabled]	
Memory RAS Feature	[Normal]	
F1 Help	↑ ↓ Select Item	-/+ Change Values
Esc Exit	< > Select Menu	Enter Select ▶ Sub-Menu
		F9 Setup Defaults
		F10 Save and Exit

See the table below for the items.

Option	Parameter	Description	Your Setting
Installed memory	–	Indicates the mounted memory capacity (Display only).	
Available under 4GB	–	Indicates the capacity of memory available in the area smaller than 4GB. (Display only)	
Memory Retest	[No] Yes	Clears the DIMM group error status information. Run this menu when the failed DIMM(s) are replaced.	
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" indicates that every memory device is tested. "Disabled" indicates that only the memory initialization is done.	
Online Spare Memory	[Disabled] Enabled	Active when the Online Spare Memory can be configured with the installed DIMMs. Select "Enabled" to enable the Online Spare Memory feature.	
Memory RAS Feature	[Normal] Mirror	Active when the Memory Mirroring can be configured with the installed DIMMs. Select "Mirror" to enable the memory mirroring function.	

[ ]: Factory-set

## Memory Riser Board x

Selecting "Memory Riser Board x (A to D)" on the Memory Configuration menu displays the following submenu.

Phoenix BIOS Setup Utility		
Advanced		
Memory Configuration	Item Specific Help	
DIMM #1 Status	Normal	
DIMM #2 Status	Normal	
DIMM #3 Status	Normal	
DIMM #4 Status	Normal	
DIMM #5 Status	Not Installed	
DIMM #6 Status	Not Installed	
DIMM #7 Status	Not Installed	
DIMM #8 Status	Not Installed	

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

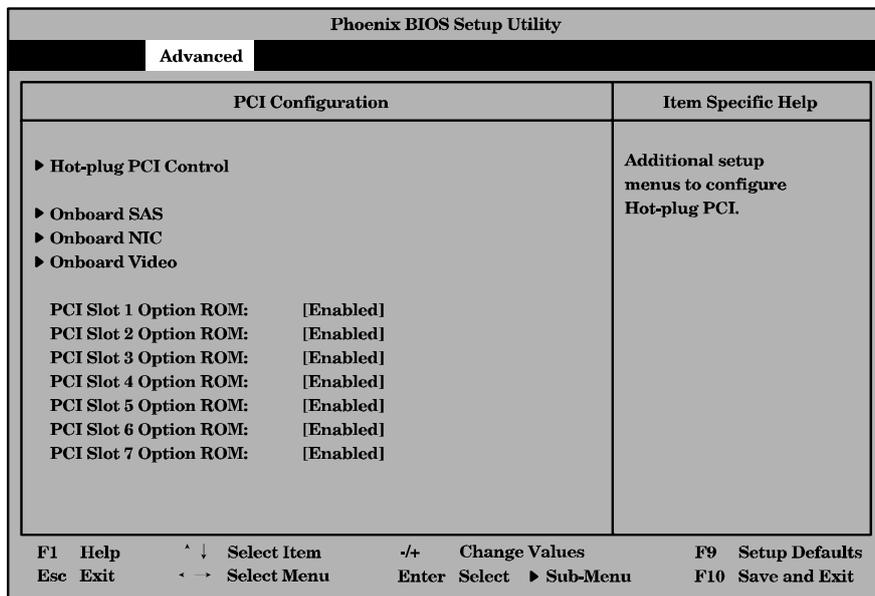
See the table below for the items.

Option	Parameter	Description	Your Setting
DIMM #1 - 8 Status	Normal Not Installed Disabled	<p>Indicates the current memory status for each memory board.</p> <p>"Normal" indicates that the memory devices operate normally.</p> <p>"Not Installed" indicates that no memory devices are installed. (Display only)</p> <p>"Disabled" indicates that one or more memory devices are defective.</p> <p>For the DIMM socket associated with the DIMM number on this menu, see page 4-5.</p>	

[    ]: Factory-set

## PCI Configuration

Selecting "PCI Configuration" on the Advanced menu displays the following screen. Selecting an item on the screen allows the proper submenu to appear.



See the table below for the items.

Option	Parameter	Description	Your Setting
PCI Slot 1-7 Option ROM	[Enabled] Disabled	Disables/enables the Option ROM BIOS on the PCI bus.	

[ ]: Factory-set

---

**IMPORTANT:** If you want to boot the OS contained in the internal hard disk drive when any of the PCI slots #1 through #7 contains a PCI card, the parameter for the "PCI Slot x Option ROM" (x: slot containing the PCI card) must be set to "Disabled".

---

## Hot-plug PCI Control

Selecting "Hot-plug PCI Control" on the PCI Configuration submenu displays the following screen.

Phoenix BIOS Setup Utility	
Advanced	
Hot-plug PCI Control	Item Specific Help
Reserving memory space for PHP: <b>[Disabled]</b>	<p>Determines memory space at every empty slot for PHP(PCI Hot Plug).</p> <p>Reserved memory space is</p> <p>[Disabled] None [Minimum] 6( 2+4) MB [Middle] 48(16+32) MB [Maximum] 256(192+64) MB</p>
<p>F1 Help    ^ ↓ Select Item    -/+ Change Values    F9 Setup Defaults Esc Exit    &lt; → Select Menu    Enter Select ▶ Sub-Menu    F10 Save and Exit</p>	

See the table below for the items.

Option	Parameter	Description	Your Setting
Reserving memory space for PHP	[Disabled] Minimum Middle Maximum	<p>Determines memory space at every empty slot for PHP (PCI Hot-plug). Reserved memory space is: [Disabled] None [Minimum] 6 (2+4) MB [Middle] 48 (16+32) MB [Maximum] 256 (192+64) MB</p>	

[ ]: Factory-set

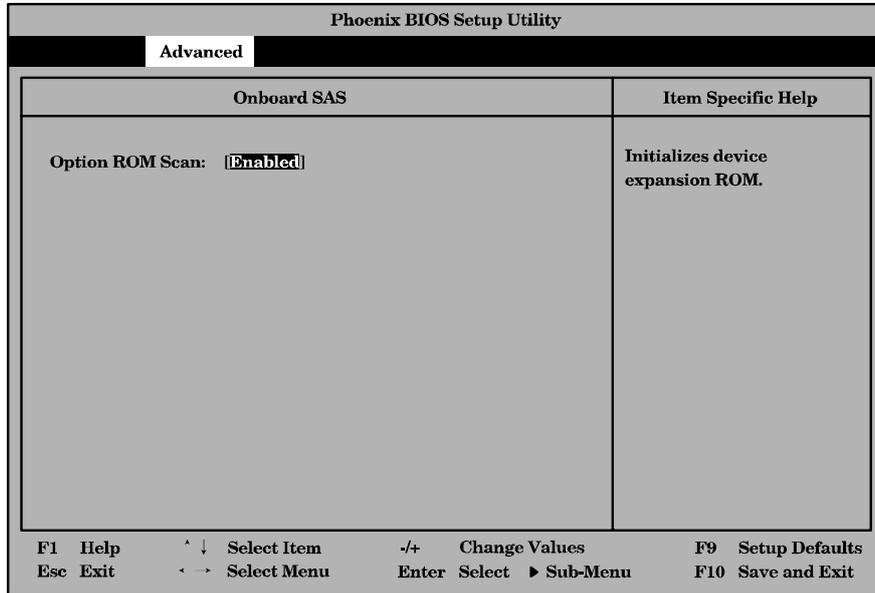
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**NOTE:** The bus number of the PCI slot varies depending on whether this parameter is set to "Disabled" or to another setting. Pay attention when you need to setup the program again.

---

## Onboard SAS/Onboard NIC/Onboard Video

Selecting "Onboard SAS", "Onboard NIC", or "Onboard Video" on the PCI Configuration submenu displays a screen similar to the one shown below. (Shown below is the one when Onboard SAS is selected.)



See the table below for the items.

Option	Parameter	Description	Your Setting
Option ROM Scan	[Enabled]	Specifies whether the expansion BIOS of the onboard controller is enabled or disabled.	
LAN #1-4 Option ROM Scan	Disabled		

[ ]: Factory-set

## Peripheral Configuration

Selecting "Peripheral Configuration" on the Advanced menu displays the following screen.

Phoenix BIOS Setup Utility		
Advanced		
Peripheral Configuration	Item Specific Help	
Serial port A:	[Enabled]	Configure serial port A using options:
Base I/O address:	[3F8]	
Interrupt:	[IRQ 4]	
Serial port B:	[Enabled]	[Disabled]
Base I/O address:	[2F8]	No configuration
Interrupt:	[IRQ 3]	[Enabled]
USB 2.0 Controller:	[Enabled]	User configuration
Legacy USB Support:	[Enabled]	
Serial ATA:	[Enabled]	
Native Mode Operation:	[Auto]	

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

See the table below for the items.

---

**IMPORTANT:** Note that the interrupt and/or base I/O address cannot overlap with others. If the value set for the interrupt or base I/O address is used for another resource, the yellow asterisk (\*) appears. Properly reset any item displaying a yellow asterisk.

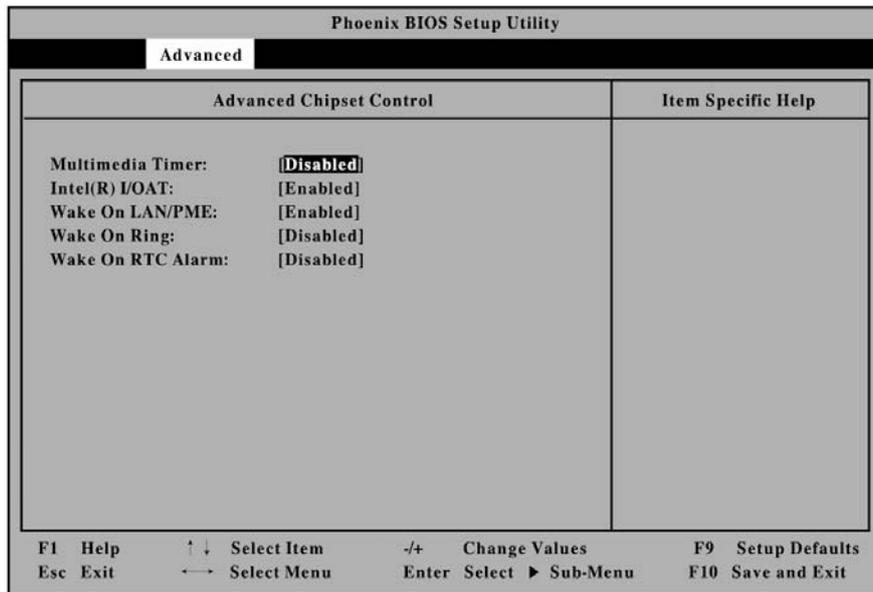
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Option	Parameter	Description	Your Setting
Serial Port A	Disabled [Enabled]	Specifies whether the serial port A is enabled or disabled.	
Base I/O Address	[3F8] 2F8 3E8 2E8	Selects the base address and interrupt (IRQ) for serial port A. These menus are displayed only when the Serial port A is enabled.	
Interrupt	IRQ 3 [IRQ 4]		
Serial Port B	Disabled [Enabled]	Specifies whether the serial port B is enabled or disabled.	
Base I/O Address	3F8 [2F8] 3E8 2E8	Selects the base address and interrupt (IRQ) for serial port B. These menus are displayed only when the Serial port B is enabled.	
Interrupt	[IRQ 3] IRQ 4		
USB 2.0 Controller	Disabled [Enabled]	Specifies whether the USB 2.0 controller is enabled or disabled.	
Legacy USB Support	Disabled [Enabled]	Specifies whether the USB keyboard is available in an OS which does not formally support USB.	
Serial ATA	Disabled [Enabled]	Specifies whether the serial ATA is enabled or disabled.	
Native Mode Operation	[Auto] Serial ATA	Selects the Native Mode operation for ATA. NOTE: Native Mode is not supported by all the operating systems.	

[ ]: Factory-set

## Advanced Chipset Control

Selecting "Advanced Chipset Control" on the Advanced menu displays the following screen. Positioning the cursor on a menu (item preceded by symbol "✱") and pressing **Enter** displays the corresponding submenu.



See the table below for the items.

Option	Parameter	Description	Your Setting
Multimedia Timer	[Disabled] Enabled	Selecting "Enabled" enables this function if the OS supports the HPET feature.	
Intel(R) I/OAT	[Enabled] Disabled	Specifies whether the Intel(R) I/O Acceleration Technology is enabled or disabled.	
Wake On LAN/PME	[Enabled] Disabled	Specifies whether the remote power-on function through network is enabled or disabled.	
Wake On Ring	[Disabled] Enabled	Specifies whether the remote power-on function through a serial port is enabled or disabled.	
Wake On RTC Alarm	[Disabled] Enabled	Specifies whether the remote power-on function through an RTC alarm is enabled or disabled.	

[ ]: Factory-set

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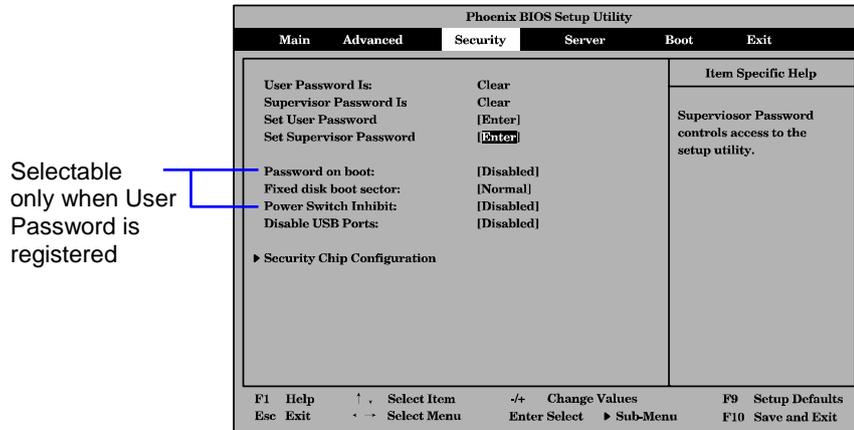
**NOTE:** When the 10GBase-SR adapter is installed, the server is powered on even if the [Wake On LAN/PME] is set to [Disabled].

---

## Security

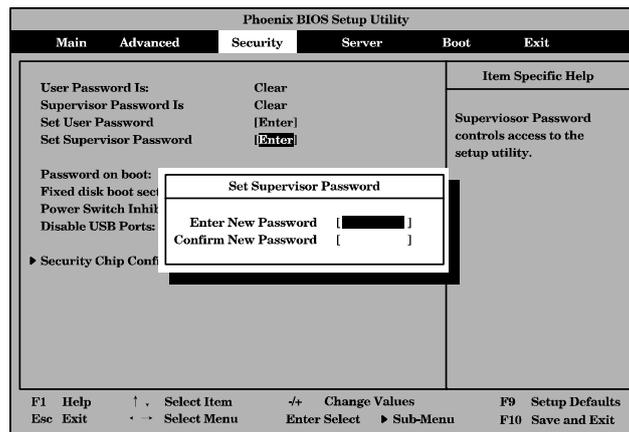
Positioning the cursor to "Security" shows the following screen.

On the Security menu, register the Supervisor password first, then the User password. When the User password is registered, you can access all the menu items.



If you press **Enter** on "Set Supervisor Password", a screen similar to the one shown below appears.

Specify the Supervisor password in the dialog box. Enter each of the passwords with up to seven characters including alphanumerics and symbols.



After the Supervisor password has been registered, specify the User password in the same way.

---

### IMPORTANT:

- Set the passwords only after the OS has been installed.
  - If you forget the passwords, contact your service representative.
-

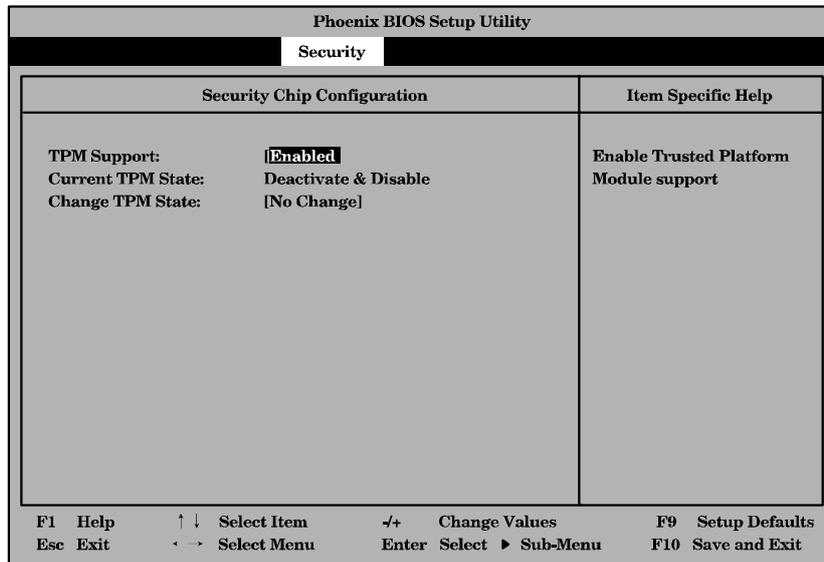
See the table below for the items.

Option	Parameter	Description	Your Setting
Set User Password	Up to seven alphanumerics	Press <b>Enter</b> to display the user password input screen. Using this password, access to the SETUP menu is restricted. This item becomes accessible once a Supervisor password is defined.	
Set Supervisor Password	Up to seven alphanumerics	Press <b>Enter</b> to display the supervisor password input screen. This password enables access to all the SETUP menus. This setting can be done only when login with a Supervisor password to the BIOS SETUP.	
Password on boot	[Disabled] Enabled	Specifies whether the passwords are asked during the boot process. This item becomes accessible once a User password is defined.	
Fixed disk boot sector	[Normal] Write Protect	Prevents data from being written to the hard disk drives.	
Power Switch Inhibit	[Disabled] Enabled	Specifies whether the power switch is enabled or disabled. If this item is set to "Enabled," the power cannot be turned off using the POWER/SLEEP switch (including the forced shutdown). The system also cannot enter a power saving mode by pressing the SLEEP switch. This item becomes accessible once a User password is defined.	
Disable USB Ports	[Disabled] Front Front+Rear	Specifies whether the USB port is enabled or disabled. [Front] disables the USB port at the front of chassis. [Front+Rear] disables all the USB ports. NOTE: If [Front+Rear] is specified, the internal USB port is also disabled. If you intend to use an internal USB device, specify [Disabled] or [Front].	

[ ]: Factory-set

## Security Chip Configuration

Selecting "Security Chip Configuration" on the Security menu displays the following screen. The screen shown below is when [TPM Support] is set to [Enabled].



See the table below for the items.

Option	Parameter	Description	Your Setting
TPM Support	[Disabled] Enabled	Enables or disables the TPM (Trusted Platform Module).	
Current TPM State	–	This menu appears only when "Enabled" is selected in [TPM Support]. Indicates the TPM State currently being set. (Display only)	
Change TPM State	[No Change] Enable & Activate Deactivate & Disable Clear	This menu appears only when "Enabled" is selected in [TPM Support]. Select [Enable & Activate] to use the TPM features. If you change this item parameter, a confirmation screen appears at the end of the POST after the system has been restarted. Select [Execute] on the confirmation screen.	

[ ]: Factory-set

---

**IMPORTANT:** If you select any other parameter than [No Change] to change the TPM State, a confirmation screen shown below appears at the end of POST after the system has been restarted. 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 action 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:  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
```

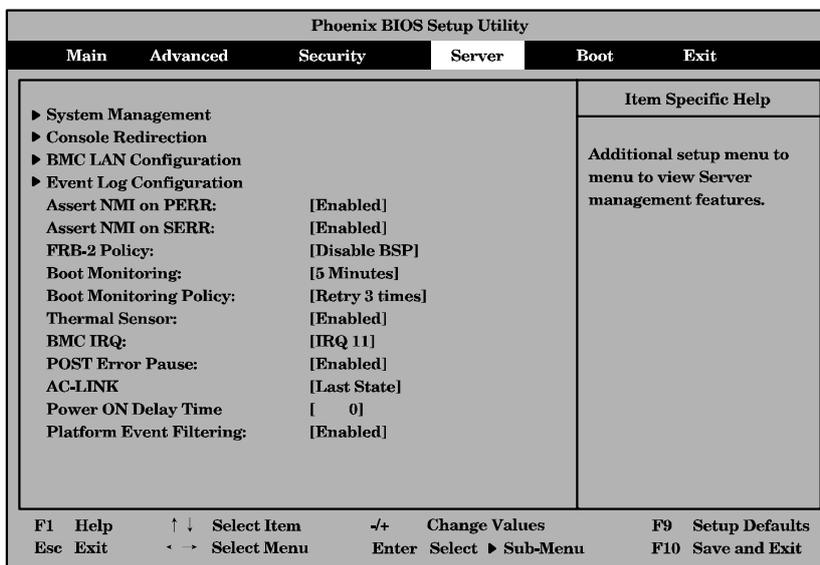
---

## Server

Positioning the cursor on "Server" shows the Server menu.

The items which can be set on the Server menu and their functions are described below. For the setting, first select "System Management" or "Console Redirection" and press **Enter** to display the proper submenu.

The following screen shows when [5 Minutes] is set for [Boot Monitoring].



See the table below for the items.

Option	Parameter	Description	Your Setting
Assert NMI on PERR	Disabled [Enabled]	Indicates whether PCI PERR is supported or not. If this item is set "Enabled", the system offers an error through the NMI when an error occurred.	
Assert NMI on SERR	Disabled [Enabled]	Indicates whether PCI SERR is supported or not. If this item is set "Enabled", the system offers an error through the NMI when an error occurred.	
FRB-2 Policy	Disable FRB2 Timer [Disable BSP] Do Not Disable BSP Retry 3 Times	Specify whether the processor is disabled or not when a FRB-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	Indicates whether the boot monitoring function is enabled or disabled on booting. To use this function, install NEC ESMPRO Agent. Do not use this function if the system is booted from the OS without the installation of the NEC ESMPRO Agent or CD-ROM. Set this item to "Disabled" if ARCServe uses the Disaster Recovery Option.	

Option	Parameter	Description	Your Setting
Boot Monitoring Policy	[Retry 3 Times] Always Retest	Appears when the boot monitoring feature is enabled. This item indicates the process followed at the occurrence of a timeout during the boot monitoring. If [Retry 3 times] is selected, the system is reset after the occurrence of timeout and the OS boot is retried up to three times. If [Always Reset] is selected, the system is reset after the occurrence of timeout and the OS boot is retried repeatedly.	
Thermal Sensor	Disabled [Enabled]	Enables or disables the temperature sensor monitoring function.	
BMC IRQ	Disabled [IRQ 11]	Indicates the IRQ of the BMC interrupt.	
Post Error Pause	Disabled [Enabled]	Indicates whether POST is aborted once at its end if an error occurs during its execution.	
AC-LINK	Stay Off [Last State] Power On	Indicates the AC-LINK function. Shows the power state of the server.	
Power ON Delay Time	[20] - 255	Sets the power on delay time when "Power On" or "Last State" is specified for AC LINK.	
Platform Event Filtering	Disabled [Enabled]	Enables or disables the Platform Event Filtering feature of the baseboard management controller (BMC).	

[ ]: Factory-set

The table below shows the operation when the AC power to the server is turned off once and then on again, depending on the "AC-LINK" settings.

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

\* Press the POWER/SLEEP switch continuously for at least four seconds. This forcibly turns off the power.

---

**IMPORTANT:** Set this item to "Power on" in order to link the AC power source supplied from the UPS when the server is connected to a UPS.

---

## System Management

Selecting "System Management" on the Server menu shows the following screen.

Phoenix BIOS Setup Utility	
Server	
System Management	Item Specific Help
BIOS Version:	1.0.xxxx
Board Part #:	243-xxxxxx
Board Serial #:	xxxxxxxxxx
System Part #:	[8100-xxxx]
System Serial #:	xxxxxxxxxx
Chassis Part #:	243-xxxxxx
Chassis Serial #:	xxxxxxxxxx
Onboard LAN1 MAC Address:	xx-xx-xx-xx-xx-xx
Onboard LAN2 MAC Address:	xx-xx-xx-xx-xx-xx
Onboard LAN3 MAC Address:	xx-xx-xx-xx-xx-xx
Onboard LAN4 MAC Address:	xx-xx-xx-xx-xx-xx
Management LAN MAC Address:	xx-xx-xx-xx-xx-xx
F1 Help	↑ ↓ Select Item
Esc Exit	← → Select Menu
	+/- Change Values
	Enter Select ▶ Sub-Menu
	F9 Setup Defaults
	F10 Save and Exit

See the table below for the items.

Option	Parameter	Description	Your Setting
BIOS Version	–	Indicates the BIOS version. (Display only)	
Board Part #	–	Indicates the IO board information. (Display only)	
Board Serial #	–		
System Part #	–	Indicates the system information. (Display only)	
System Serial #	–		
Chassis Part #	–	Indicates the chassis information. (Display only)	
Chassis Serial #	–		
Onboard LAN 1-4 MAC Address	–	Indicates the MAC address for each LAN controller.	
Management LAN MAC Address	–	Indicates the MAC address for the management LAN.	
BMC Device ID	–	Indicates the BMC (Baseboard Management Controller) information. (Display only)	
BMC Device Revision	–		
BMC Firmware Revision	–		
SDR Revision	–	Indicates the SDR (Sensor Data Record) revision. (Display only)	
PIA Revision	–	Indicates the PIA revision. (Display only)	
HSC Firmware Revision	–	Indicates the HSC (Hot Swap Controller) firmware revision.	

[ ]: Factory-set

## Console Redirection

Selecting "Console Redirection" on the Server menu shows the following screen.

Phoenix BIOS Setup Utility	
Server	
Console Redirection	Item Specific Help
<b>BIOS Redirection Port:</b> [Disabled] <b>Baud Rate:</b> [19.2K] <b>Flow Control:</b> [CTS/RTS] <b>Terminal Type:</b> [VT100+] <b>Continue Redirection after POST:</b> [Enabled] <b>Remote Console Reset:</b> [Disabled]	Selects the Serial port to use for Console Redirection. "Disabled" completely disables Console Redirection.
F1 Help      ↑ ↓ Select Item      +/- Change Values      F9 Setup Defaults Esc Exit      ← → Select Menu      Enter Select      ▶ Sub-Menu      F10 Save and Exit	

See the table below for the items.

Option	Parameter	Description	Your Setting
BIOS Redirection Port	[Disabled] Serial Port A Serial Port B	Selects the port to be used as the redirection port. The parameters specified in the Peripheral Configuration submenu are used as address and interrupt.	
Baud Rate	9600 [19.2K] 38.4K 57.6K 115.2K	Specifies the baud rate used for the interface with the successive hardware consoles.	
Flow Control	None XON/XOFF [CTS/RTS] CTS/RTS+CD	Specifies the flow control method.	
Terminal Type	PC ANSI [VT100+] VT-UTF8	Specifies the console type.	
Continue Redirection after POST	Disabled [Enabled]	Specifies whether the console redirection feature is continuously executed after POST or not.	
Remote Console Reset	[Disabled] Enabled	Enables or disables the reset from the remote console.	

[ ]: Factory-set

## BMC LAN Configuration

Selecting "BMC LAN Configuration" on the Server menu displays the following screen.

Phoenix BIOS Setup Utility	
Server	
BMC LAN Configuration	Item Specific Help
Shared BMC LAN:	[Disabled]
IP Address:	[192.168.001.001]
Subnet Mask:	[255.255.255.000]
Default Gateway:	[000.000.000.000]
DHCP:	[Disabled]
Web Interface	
HTTP:	[Disabled]
HTTP Port Number:	[ 80]
HTTPS:	[Disabled]
HTTPS Port Number:	[ 443]
Command Line Interface	
Telnet:	[Disabled]
F1 Help Esc Exit	↑↓ Select Item ←→ Select Menu
-/+ Change Values Enter Select	F9 Setup Defaults F10 Save and Exit
	▶ Sub-Menu

See the table below for the items.

Option	Parameter	Description	Your Setting
Shared BMC LAN	[Disabled] Enabled	When set to [Disabled], uses the management LAN port for the management LAN. When set to [Enabled], the LAN port #3 can be used for the management LAN while sharing with the standard LAN. In this case, the management LAN port is disabled.	
IP Address	[192.168.001.001]	If the DHCP is not used to automatically obtain an IP address, enter the BMC's IP address. If the DHCP has been used, the IP address obtained automatically will appear.	
Subnet Mask	[255.255.255.000]	If the DHCP is not used to automatically obtain a subnet mask IP address, enter the subnet mask of your management LAN. If the DHCP has been used, the subnet mask IP address obtained automatically will appear.	
Default Gateway	[000.000.000.000]	If the DHCP is not used to automatically obtain a default gateway IP address, enter the default gateway of your management LAN. If the DHCP has been used, a default gateway obtained automatically will appear.	
DHCP	[Disabled] Enabled	Set it to [Enabled] to obtain an IP address from the DHCP server automatically. If you intend to specify an IP address manually, set it to [Disabled].	
HTTP	[Disabled] Enabled	Set it to [Enabled] to use the HTTP communication for the Web interface.	
HTTP Port Number	[80]	Specify the TCP port number which the management LAN uses for the HTTP communication.	

Option	Parameter	Description	Your Setting
HTTPS	[Disabled] Enabled	Set it to [Enabled] to use the HTTPS communication for the Web interface.	
HTTPS Port Number	[443]	Specifies the TCP port number which the management LAN uses for the HTTPS communication.	
Telnet	[Disabled] Enabled	Set it to [Enabled] to use the Telnet communication as a command line interface.	
Telnet Port Number	[23]	Specifies the TCP port number to be used for the Telnet communication.	
SSH	[Disabled] Enabled	Set it to [Enabled] to use the SSH communication as a command line interface.	
SSH Port Number	[22]	Specifies the TCP port number to be used for SSH communication.	
Clear BMC Configuration	[Enter]	Press <b>Enter</b> and select "Yes" to initialize the BMC configuration.	

[ ]: Factory-set

---

**IMPORTANT:** Notes on performing Clear BMC Configuration

- Executing the "Load Setup Defaults" in the BIOS SETUP utility does not restore the default value for the settings related to the management LAN of the BMC. To restore the default value, you need to execute a Clear BMC Configuration.
  - It takes a short while until the initialization completes after the execution of the Clear BMC Configuration.
  - Executing the Clear BMC Configuration also clears settings made in NEC DianaScope. Before the execution, be sure to make the backup copy of the settings information of NEC DianaScope.
- 

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

---

## Event Log Configuration

Selecting "Event Log Configuration" on the Server menu and pressing **Enter** displays the following screen.

Phoenix BIOS Setup Utility					
Server					
Event Log Configuration				Item Specific Help	
<b>Setup Notice</b> If you select "System Event Log" menu below, it may take a few minutes to display				Display the System Event Log.	
▶ System Event Log  Clear All Event Log: [Press Enter]					
F1 Help	↑ ↓ Select Item	+/- Change Values	F9 Setup Defaults		
Esc Exit	< > Select Menu	Enter Execute Command	F10 Save and Exit		

See the table below for the items.

Option	Parameter	Description	Your Setting
Clear All Event Log	–	Press <b>Enter</b> and select "Yes" to clear the system event log.	

[ ]: Factory-set

## System Event Log

Selecting "System Event Log" on the "Event Log Configuration" of Server menu displays the following screen.

Phoenix BIOS Setup Utility					
Server					
System Event Log				Item Specific Help	
SEL Entry Number = 1/121 SEL Record ID = 0904 SEL Record Type = 02 - System Event Record Timestamp = 2007/09/05 10:58:28 Generator ID = 20 00 SEL Message Rev = 04 Sensor Type = 12 - System Event Sensor Number = 87 - System Event SEL Event Type = 6F - Sensor specific Event Description = OEM System Boot Event SEL Event Data = 41 8F FF				This is an entry The System Event Log:  Eyes used to view:  Up arrow : Newer SEL Down arrow : Older SEL  <> : Newer SEL <+> : Older SEL  Home : Newer SEL End : Older SEL	
F1 Help	↑ ↓ Select Item	+/- Change Values	F9 Setup Defaults		
Esc Exit	< > Select Menu	Enter Execute Command	F10 Save and Exit		

Shown above is an example of the system event log.

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

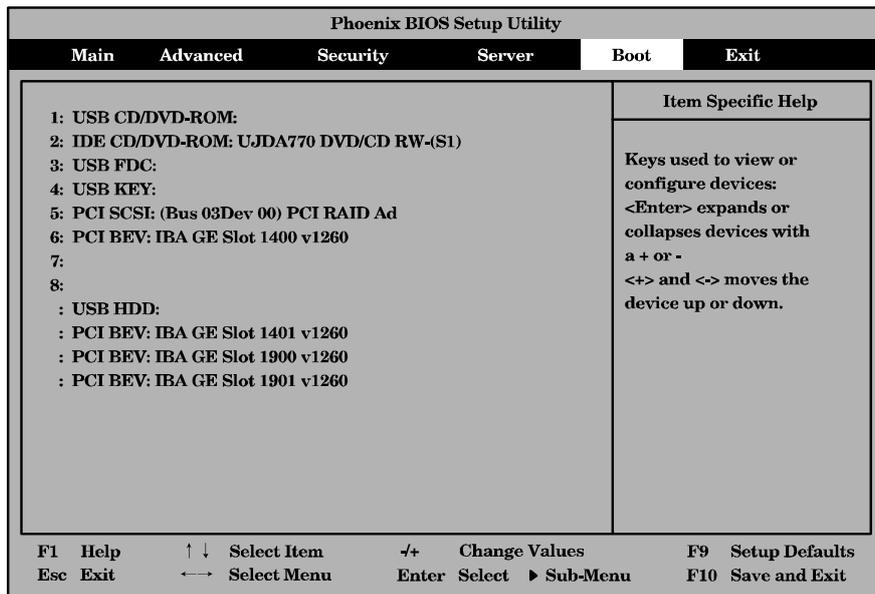
---

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

---

## Boot

Positioning the cursor on "Boot" shows the Boot menu which is used to set the boot priority.



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

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

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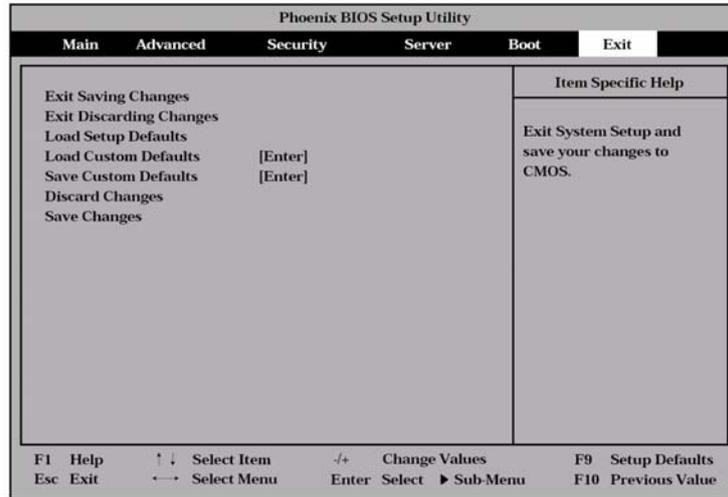
**IMPORTANT:** To boot on the EXPRESSBUILDER, set the priority of the devices as shown in the figure above.

---

## Exit

Positioning the cursor to "Exit" shows the Exit menu.

The options on the menu are described below.



### Exit Saving Changes

Select this item to terminate SETUP after saving the newly selected information in CMOS (non-volatile memory). Selecting "Exit Saving Changes" causes the confirmation screen to appear.

If you select "Yes," SETUP is terminated and the newly selected information is saved in CMOS (non-volatile memory). Then the server automatically reboots the system.

### Exit Discarding Changes

Select this item to terminate SETUP without saving the newly selected information in CMOS (non-volatile memory).

Selecting "Yes" allows the SETUP to be terminated without storing the modified information. If the setting value is modified, the confirmation screen will appear.

Selecting "No" allows the SETUP to be terminated without storing the modified information. If you select "Yes" in the next screen, SETUP is terminated with the modified information saved in CMOS. Then the server automatically reboots the system.

### **Load Setup Defaults**

Select this item to return all the values of SETUP to the default values. Selecting "Load Setup Defaults" causes the confirmation screen to appear.

Select "Yes" to return the values to the default values. Select "No" to return to the Exit menu screen.

### **Save Custom Defaults/Load Custom Defaults**

Running the Save Custom Defaults menu saves the current SETUP parameters as the user-defined SETUP defaults. The Load Custom Defaults menu is used to restore the user-defined SETUP defaults.

---

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

---

### **Discard Changes**

Select this item to return the values you have just modified to the previous values before saving the values to CMOS. Selecting "Discard Changes" causes the confirmation screen to appear.

Select "Yes" to discard the newly selected information and return to the previous values.

### **Save Changes**

Select this item to save the newly selected information to CMOS (non-volatile memory) without terminating SETUP. Selecting "Save Changes" causes the confirmation screen to appear.

Select "Yes" to save the newly selected information to CMOS (non-volatile memory)

# RAID SYSTEM CONFIGURATION

This section describes how to use the internal hard disk drives as a RAID System using the Onboard RAID Controller (MegaRAID ROMB).

For more information about the optional RAID Controller, refer to the documents provided with the optional RAID Controller.

---

## RAID

### Overview of the RAID System

#### What is RAID (Redundant Array of Inexpensive Disks)?

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

RAID can configure several 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 (MegaRAID ROMB) allows to divide a single disk group into several logical drives. The Onboard RAID Controller (MegaRAID ROMB) recognizes these virtual disks as if they were a single HDD. The Onboard RAID Controller (MegaRAID ROMB) can access in parallel several HDDs configuring a disk group.

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

#### RAID Levels

The record mode enabling the RAID feature includes several levels. Among the levels, the on-board RAID (MegaRAID ROMB) supports the following levels; RAID 0, RAID 1, RAID 5, RAID 6, RAID10, and RAID 50. The number of HDDs required to create a disk group varies depending on the RAID level, as shown in the table below.

RAID level	Number of required HDDs	
	Min.	Max.
RAID 0	1	8
RAID 1	2	2
RAID 5	3	8
RAID 6	3	8
RAID 10	4	8
RAID 50	6	8

---

**NOTE:** For more information on the RAID levels, see "RAID Levels" described later in this chapter.

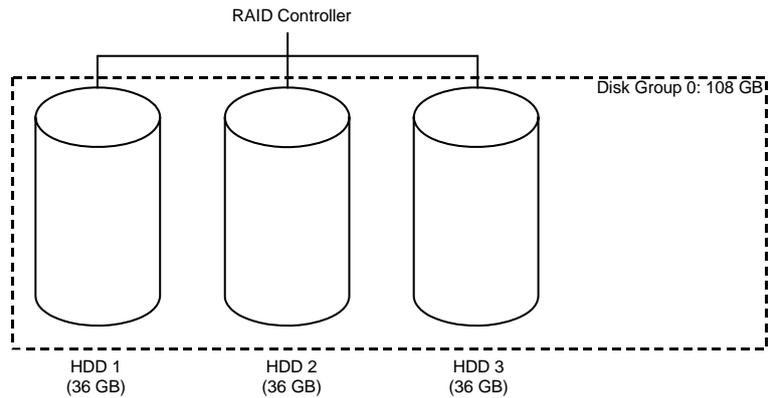
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#### Disk Group

A disk group is configured with several HDDs (at least two).

The authorised number of disk groups is equal to the number of HDDs.

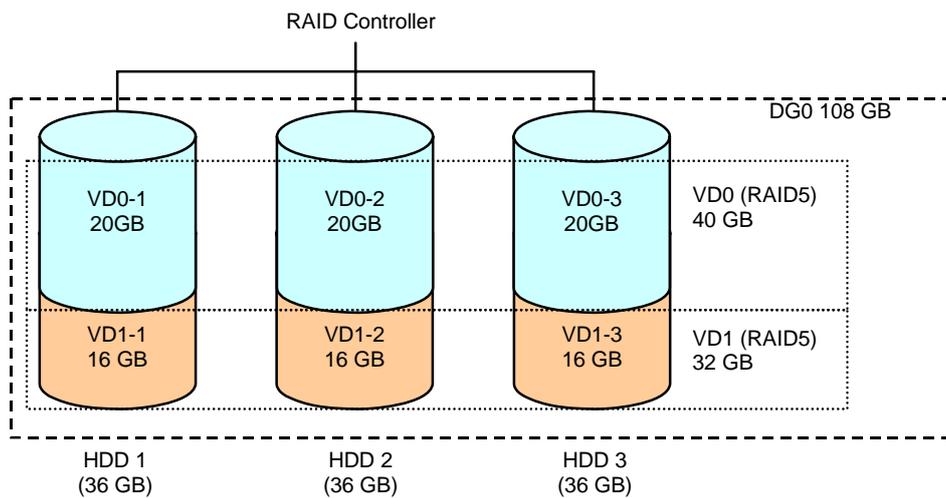
The figure below shows a sample configuration. The three HDDs are connected to the Onboard RAID Controller (MegaRAID ROMB), creating one disk group (DG).



### Virtual Disk

A Virtual Disk is a logical drive defined in a Disk Group. It is recognized as a physical drive by the OS. The authorised 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 (MegaRAID ROMB) is connected to three HDDs, creating one Disk Group. Two RAID5 virtual disks (VD) are defined in the Disk Group.



### Parity

Parity implies data redundancy. A single set of redundant data is created from the data saved in several HDDs (at least two). The redundant data thus created is used for data recovery when a HDD is defective.

### Hot-Swap

Hot-swapping 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 defective 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.

---

**NOTE:** For a standby rebuild (rebuild using hot-spares), see "Features of Onboard RAID Controller (MegaRAID ROMB)".

---

## RAID Levels

### Characteristics of the 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"> <li>Data read/write at the highest rate</li> <li>Largest capacity</li> <li>Capacity: (capacity of single HDD) × (number of HDDs)</li> </ul>
RAID1	Mirroring	Yes	<ul style="list-style-type: none"> <li>Two HDDs required</li> <li>Capacity: capacity of single HDD</li> </ul>
RAID5	Striping of both data and redundant data	Yes	<ul style="list-style-type: none"> <li>Three or more HDDs required</li> <li>Capacity: (capacity of single HDD) × ((number of HDDs) - 1)</li> </ul>
RAID6	Striping of both data and redundant data	Yes	<ul style="list-style-type: none"> <li>Three or more HDDs required</li> <li>Capacity: (capacity of single HDD) × ((number of HDDs) - 2)</li> </ul>
RAID10	Spanning of RAID1	Yes	<ul style="list-style-type: none"> <li>Four or more HDDs required</li> <li>Capacity: (capacity of single HDD) × ((number of HDDs) - 2)</li> </ul>
RAID50	Spanning of RAID5	Yes	<ul style="list-style-type: none"> <li>Six or more HDDs required</li> <li>Capacity: (capacity of single HDD) × ((number of HDDs) - 2)</li> </ul>

### RAID0

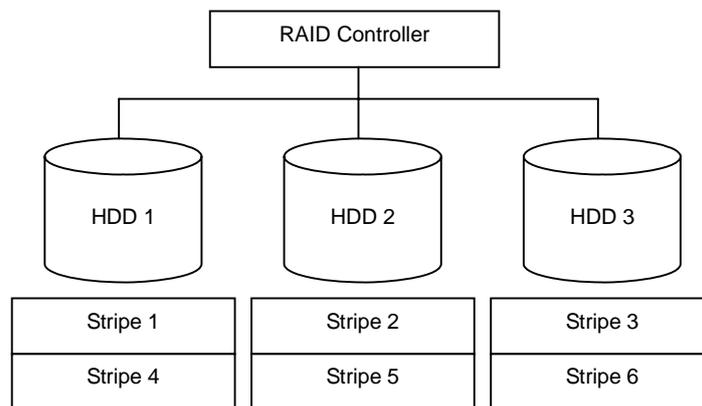
In RAID0, data to be recorded is distributed to HDDs. The mode is called "striping".

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

---

**IMPORTANT:** RAID0 does not have data redundancy. If a HDD is defective, the data saved in the HDD cannot be recovered.

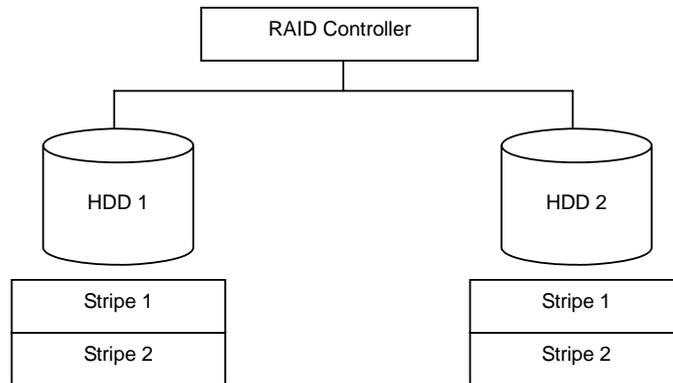
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## RAID1

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

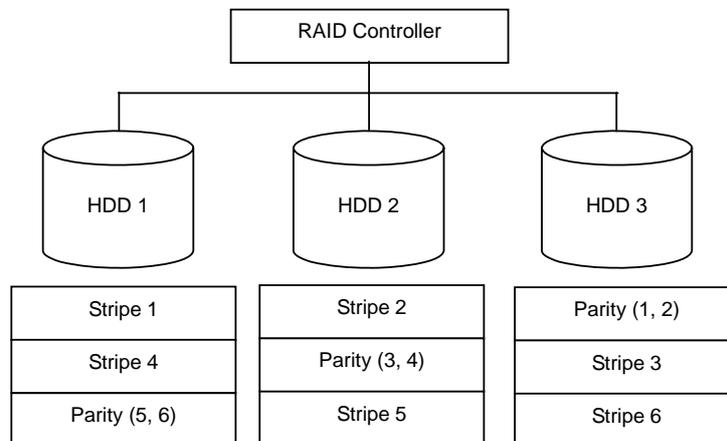
When data is written onto a single HDD, the same data is written onto another HDD. If either one of the HDDs is defective, the other HDD containing the same data can substitute for the defective HDD. Thus the system can continue to operate without interruption.



## RAID5

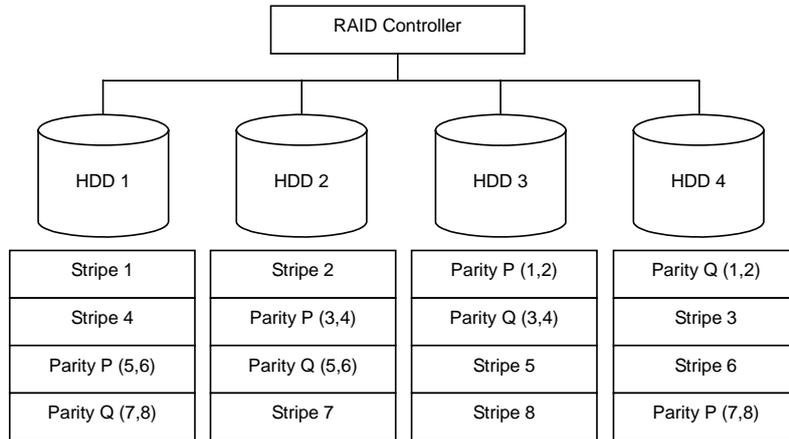
In RAID5, data is distributed to HDDs by striping and, at the same time, the parity (redundant data) is distributed to the HDDs. This mode is called "striping with distributed parity".

Each of stripe  $x$ , stripe  $x+1$ , and parity  $(x, x+1)$  created from stripe  $x$  and stripe  $x+1$  is written onto a specific HDD. Accordingly, the total capacity assigned to the parity is just the same as the capacity of a single HDD. If any of the HDDs configuring a logical drive is defective, data is still available.



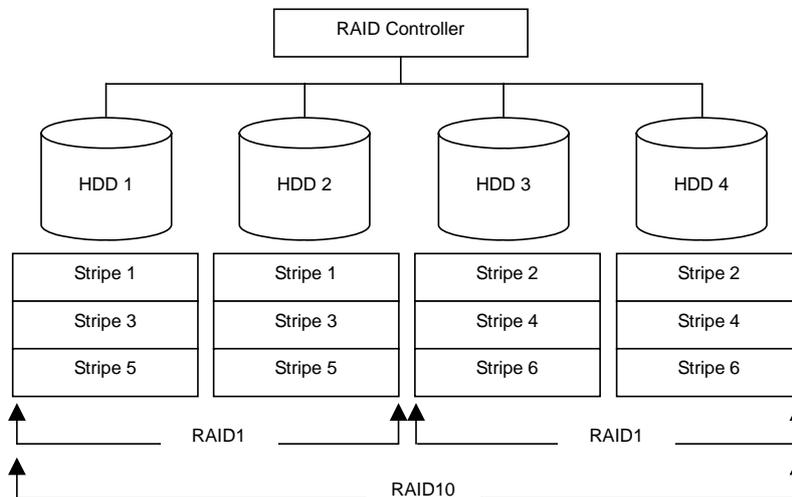
## RAID6

RAID 6 extends RAID 5 by adding an additional parity block (Q) created by different calculation method such as weighting by some factor, and thus uses block-level striping with two parity blocks distributed across all the member disks. This mode is called "striping with duplex and distributed parity". Accordingly, the total capacity assigned to the parity is just the same as the capacity of two HDDs. If two of the HDDs configuring a logical drive are defective, data is still available.



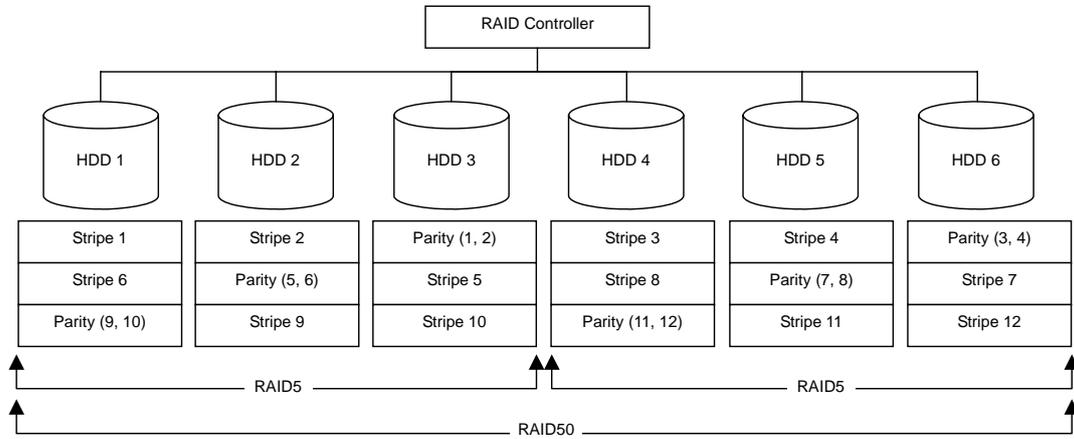
## RAID10

Data to be recorded is distributed to two HDDs in mirroring mode. Then, each mirrored data is written onto the HDDs by striping. This feature achieves the high disk access performance of RAID0 and, in addition, the high reliability of RAID1.



## RAID50

Data is distributed to HDDs by striping with distributed parity, and then written onto the HDDs by striping. This feature achieves the high disk access performance of RAID0 and, in addition, the high reliability of RAID5.



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## Features of the Onboard RAID Controller (MegaRAID ROMB)

This section describes the features of the Onboard RAID Controller (MegaRAID ROMB).

### Rebuild

If a HDD is defective, the rebuild feature can recover the data in the defective HDD. The rebuild can be applied to redundant virtual disks in the RAID1, RAID5, or RAID6 level.

### Manual Rebuild

The manual rebuild can be performed by using Universal RAID Utility, the management utility of the Onboard RAID Controller (MegaRAID ROMB). Select a HDD and start the rebuild manually.

For the detailed operation, refer to the "Universal RAID Utility User's Guide" in the EXPRESSBUILDER DVD included with the server.

### Auto Rebuild

The Onboard RAID Controller (MegaRAID ROMB) can automatically start the rebuild. The auto rebuild can be of two types, as follows:

- Standby rebuild

Automatic rebuild by using hot-spares. In a configuration including hot-spares, the rebuild is performed automatically if a HDD assigned to a virtual disk is defective.

- Hot-swap rebuild

Automatic rebuild by hot-swapping defective HDD.

---

**IMPORTANT:** Note the following for the rebuild:

- The HDD used for rebuild should have the same capacity, rotation speed, and standard as the defective HDD.
  - During rebuild, the processing rate is decreased due to the high load.
  - During rebuild, do not shutdown or reboot the server. If the server is shutdown by an unforeseen accident such as power interruption, turn on the power again as soon as possible. The rebuild restarts automatically.
  - The interval between the removal of the defective HDD and the installation of a substitute HDD should be at least 60 seconds.
  - If the hot-swap rebuild does not function, perform a manual rebuild.
-

## Patrol Read

The Patrol Read is a read & verify test in the entire area of HDDs. It can be performed for all the HDDs assigned to virtual disks and the hot-spares.

The Patrol Read allows subsequent defects of HDDs to be detected and repaired.

For HDDs configuring redundant virtual disks or those assigned to hot-spares, the error sectors detected during Patrol Read can be repaired.

---

**IMPORTANT:** Note the following for the patrol read:

- For the Onboard RAID Controller (MegaRAID ROMB), the Patrol Read feature is factory-set to "Enabled". For the LSI Logic MegaRAID SAS 8480E, the Patrol Read feature is either enabled or disabled, depending on the firmware.
  - To change the Patrol Read settings, use the Universal RAID Utility.
  - If the system is restarted while running Patrol Read, Patrol Read resumes from the point where it was stopped.
- 

## Consistency Check

The Consistency Check is used to check the consistency among the virtual drives. It is available for the redundant virtual drives except for RAID0. It is also available for hot spare.

The Consistency Check can be performed through WebBIOS or the Universal RAID Utility.

The Consistency Check performs a consistency check but can also repair the error sectors. Accordingly, it can be used as preventive maintenance.

---

**IMPORTANT:** Note the following for Consistency Check:

- During Consistency Check, the processing rate is decreased due to the high load.
  - If the system is restarted, the Consistency Check is aborted and resumes after restart.
  - To schedule Consistency Check execution, use WebBIOS, not the Universal RAID Utility.
-

## Background Initialize

The Background Initialize is automatically executed when a RAID5 virtual disk is created in the disk group composed of five or more HDDs, or when a RAID6 virtual disk is created in a disk group composed of seven or more HDDs.

The Background Initialize performs the parity generation processing in the background of the area not initialized. This process is equivalent to the Consistency Check process.

However, the Background Initialize is not performed in the following cases.

- Full Initialize has already been executed and has completed normally before executing Background Initialize.  
(\* Full Initialize is a function that clears the entire area of a virtual disk with "0".
- Consistency Check has already been executed and completed normally before executing Background Initialize.
- Rebuild has already been executed and has completed normally before executing Background Initialize (for RAID5 only).
- "Yes" is specified for "Disable BGI" in VD Definition.
- Virtual disk is in degraded or offline state.  
Background Initialize is performed if a RAID6 virtual disk is partially degraded.

The Background Initialize is executed again if any of the following cases occurred in the virtual disk on which the Background Initialize has completed.

- When the virtual disk is degraded or offline, you execute Make Online to the HDD being in offline status, and the virtual disk state becomes Optimal.
- When you replace the RAID Controller with a maintenance parts or another.
- When you execute Reconstruction to an existing virtual disk to make a RAID5 VD with five or more HDDs.
- When you execute Reconstruction to an existing virtual disk to make a RAID6 VD with seven or more HDDs.

---

**IMPORTANT:** Note the following for Background Initialize:

- During the Background Initialize, the processing rate is decreased due to the high load.
  - Background Initialize will resume a few minutes later even if it is interrupted.
-

## Reconstruction

The reconstruction feature is used to change the configuration and/or the RAID level of an existing virtual disk. The Reconstruction contains the following three features, however, the Onboard RAID Controller (MegaRAID ROMB) supports only "Migration with addition".

---

**IMPORTANT:** You can use WebBIOS for Reconstruction. The Universal RAID Utility does not support Reconstruction.

---

### Removed physical drive

Unsupported.

### Migration only

Unsupported.

### Migration with addition

Use this feature to add HDDs to an existing virtual disk. The execution patterns are shown below ( $\alpha$ : Number of HDDs to be added).

Before execution		After execution		Description
RAID level	Number of HDDs	RAID level	Number of HDDs	
RAID0	x	RAID0	$x+\alpha$	Capacity increased: equivalent to $\alpha$ HDDs
RAID0	1	RAID1	2	Capacity remains unchanged.
RAID0	x	RAID5	$x+\alpha$	Capacity increased: equivalent to $\alpha-1$ HDDs
RAID0	x	RAID6	$x+\alpha$ ( $\alpha=2$ or more)	Capacity increased: equivalent to $\alpha-2$ HDDs
RAID1	2	RAID0	$2+\alpha$	Capacity increased: equivalent to $\alpha+1$ HDDs
RAID1	2	RAID5	$2+\alpha$	Capacity increased: equivalent to $\alpha$ HDDs
RAID1	2	RAID6	$2+\alpha$	Capacity increased: equivalent to $\alpha-1$ HDDs
RAID5	x	RAID0	$x+\alpha$	Capacity increased: equivalent to $\alpha+1$ HDDs
RAID5	x	RAID5	$x+\alpha$	Capacity increased: equivalent to $\alpha$ HDDs
RAID5	x	RAID6	$x+\alpha$	Capacity increased: equivalent to $\alpha-1$ HDDs
RAID6	x	RAID0	$x+\alpha$	Capacity increased: equivalent to $\alpha+2$ HDDs
RAID6	x	RAID5	$x+\alpha$	Capacity increased: equivalent to $\alpha+1$ HDDs
RAID6	x	RAID6	$x+\alpha$	Capacity increased: equivalent to $\alpha$ HDDs

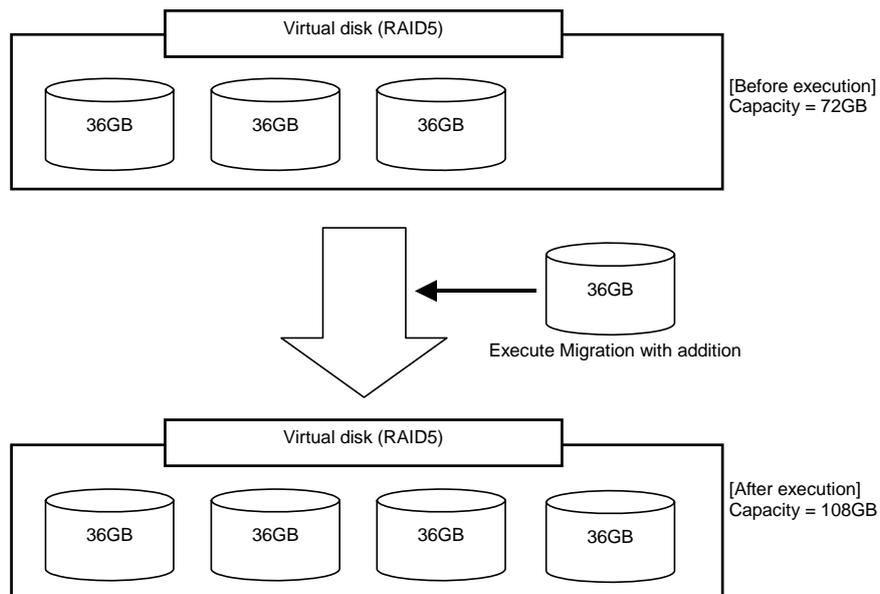
---

**IMPORTANT:** Note the following for the Reconstruction:

- Be sure to make a backup copy of the data and to perform a Consistency Check before starting the Reconstruction.
  - The Reconstruction is disabled in a configuration where several virtual disks are defined in one disk group.
  - During Reconstruction, the processing rate is decreased due to the high load.
  - The Reconstruction can be performed for a degraded or partially degraded virtual disk. However, it is recommended to execute a Rebuild to recover the virtual disk, then to execute the Reconstruction.
  - During the Reconstruction, do not shutdown or reboot the server. If the server is shutdown by an unforeseen accident such as a power interruption, turn on the power again as soon as possible. The Reconstruction restarts automatically.
  - In some configurations, the Background Initialize may start automatically upon the completion of the Reconstruction.
- 

### Ex: Migration with addition of a RAID5 virtual disk

The figure below shows an example of adding a single 36GB HDD to a RAID5 virtual disk configured with three 36GB HDDs.



---

## Before Using WebBIOS

Read the following sections describing the supported functions and precautions before using "WebBIOS".

### Supported Functions

- Indication of the model name and capacity of hard disk drive (called HDD hereafter)
- Indication of the HDD allocation status
- Creation of the virtual disk
  - Setting the RAID level
  - Setting the Stripe Block size
  - Setting the Read Policy/Write Policy/IO Policy
- Indication of the configuration information and status of virtual disk
- Removal of the virtual disk
- Clearing of the configuration
- Execution of the initialization
- Execution of the Consistency Check
- Execution of the manual rebuild
- Execution of the reconstruction

## Notes on Creating the Virtual Drive

- The HDDs configuring the disk group should have the same capacity and rotation speed.
- Be sure to execute a Consistency Check after the creation of a VD.
- When installing an OS in the VD under the Onboard RAID Controller (MegaRAID ROMB), create a VD dedicated to the OS installation.
- WebBIOS cannot be handled via the remote console functions of NEC DianaScope.
- The physical drive numbers shown in WebBIOS and those shown in the Universal RAID Utility are identified as follows.

- WebBIOS

Enclosure number and slot number shown in Physical Drives box\*

\* "X:X:X" shown in the Physical Drives box represents

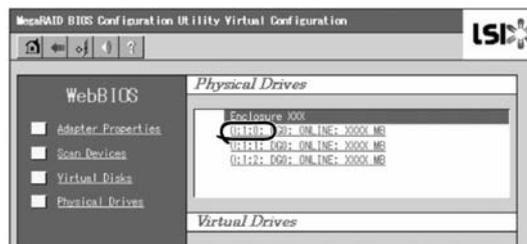
Connector number:Enclosure number:Slot number.

With this server, the Connector number is not supported, thus, it is always indicated as "()". The Enclosure Number is always "1". The Slot number (0 to 7) represents the slot number of the 2.5-inch hard disk drive bay.

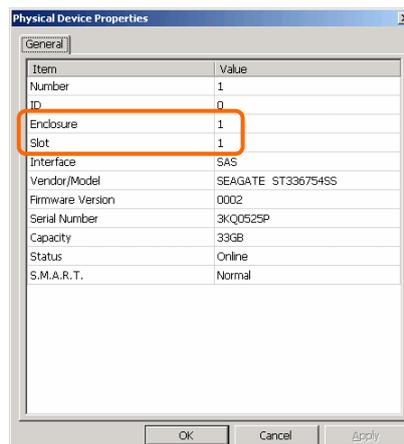
- Universal RAID Utility

Enclosure number and slot number shown in Physical Device Properties

Note that the slot numbers shown in the Physical Drives box of WebBIOS are represented by the 0-origin numbers, but those in the Universal RAID Utility are 1-origin numbers.



**Physical Drives View in WebBIOS**



**Property of a Physical Device in the Universal RAID Utility**

---

## Using WebBIOS

### Starting WebBIOS

1. Power on the server and press **Esc** when the screen shown below.



2. Press **Ctrl + H** on the POST screen to start WebBIOS.

#### ***POST screen image (with no virtual disk assigned)***

LSI MegaRAID SAS-MFI BIOS Version XXXX (Build MMM DD, YYYY)  
Copyright (c) 2007 LSI Corporation  
HA -X (Bus X Dev X) MegaRAID SAS PCI Express(TM) ROMB  
FW package: X.X.X-XXXX  
0 Logical Drive(s) found on the host adapter.  
0 Logical Drive(s) handled by BIOS  
Press <Ctrl> <H> for WebBIOS

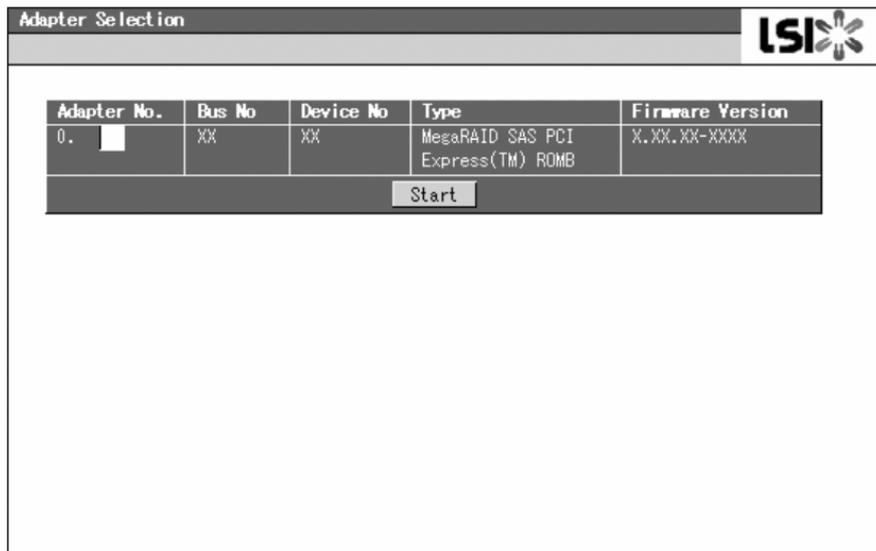
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**IMPORTANT:** Do not press any unnecessary key such as **Pause** during POST.

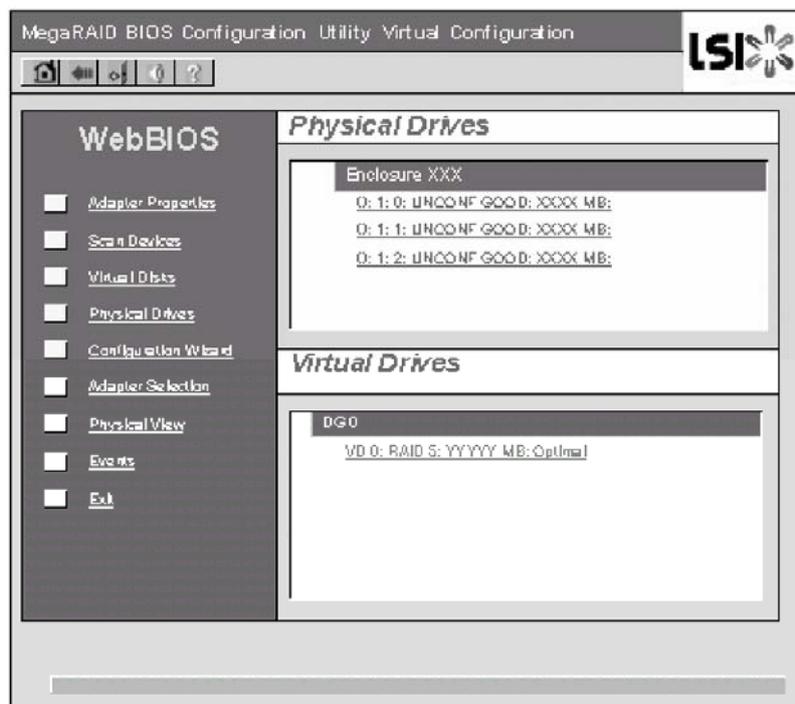
---

## Main Menu

The screen shown below is the [Adapter Selection] screen that appears first on WebBIOS. Select a controller to operate WebBIOS, and click [Start].



The WebBIOS Top Menu appears.



---

**IMPORTANT:** "X:X:X" shown in the Physical Drives box represents the Connector number:Enclosure number:Slot number. With this server, the Connector number is not supported, thus, it is always indicated as "()". The Enclosure number is always "1". The Slot number (0 to 7) represents a slot number of 2.5-inch hard disk drive bay.

---

## Adapter Properties

When you click [Adapter Properties] on the WebBIOS Top Menu, the configuration information is displayed.

MegaRAID SAS PCI Express(TM) ROMB			
Firmware Version X.XX.XX-XXXX		WebBIOS Version X.XX-XXX	
Sub Vendor ID	0x1033	Sub Device ID	0x835a
Host Interface	PCI-E	Port Count	8
MVRAM Size	32 KB	Memory Size	512 MB
Firmware Time	XXXXX XX:XX:XX:XX:XX	Serial Number	XXXXXXXX
Min Stripe Size	8 KB	Max Stripe Size	1024K
Virtual Disk Count	XX	Physical Disk Count	XX
FW Package Version	X.X.X-XXXX		

[Next](#)

[Home](#) [Back](#)

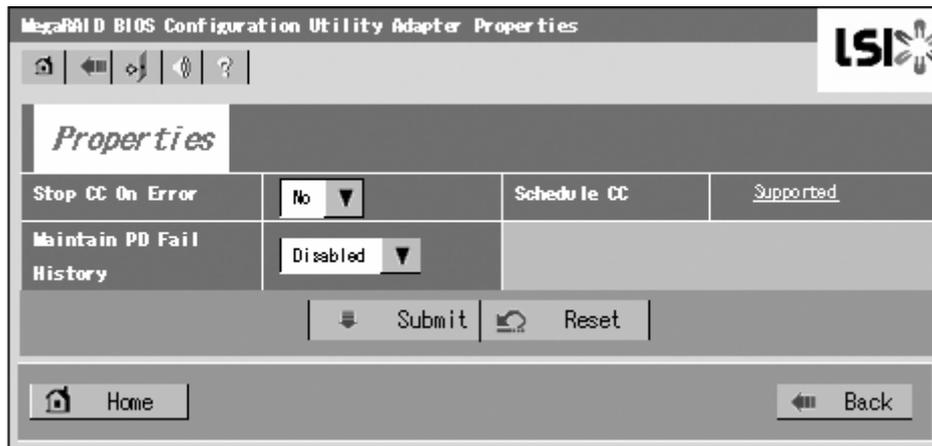
Click [Next] to see the detailed settings of this controller.

Properties			
Battery Back Up	Present	Coercion Mode	None ▼
Set Factory Defaults	No ▼	PDF Interval	300
Cluster Mode	Disabled ▼	Alarm Control	Disabled ▼
Rebuild Rate	30	Patrol Read Rate	30
BGI Rate	30	Cache Flush Interval	4
CC Rate	30	Spinup Drive Count	2
Reconstruction Rate	30	Spinup Delay	12
Adapter BIOS	Enabled ▼	Stop On Error	Disabled ▼

[Submit](#) [Reset](#) [Next](#)

[Home](#) [Back](#)

The detailed settings are continued on the next page. Click [Next] to view more information.



### Default settings and their explanation

Item	Default	Description	Change
Battery Backup	Present None	Displays Properties. • When a battery is installed: Present • When no battery is installed: None	–
Set Factory Defaults	[No] Yes	Restores vendor's factory defaults.	Prohibited *1
Cluster Mode	Disabled	–	Prohibited
Rebuild Rate	30	Recommended value: 30	Permitted
Patrol Read Rate	30	Recommended value: 30	Permitted
BGI Rate	30	Recommended value: 30	Permitted
CC Rate	30	Recommended value: 30	Permitted
Reconstruction Rate	30	Recommended value: 30	Permitted
Adapter BIOS	[Enabled] Disabled	–	Prohibited
Coercion Mode	[None] 128MB-way 1GB-way	–	Prohibited
PDF Interval	300	–	Prohibited
Alarm Control	[Disabled] Enabled Silence	Disabled: Does not issue an alarm.	Prohibited *2
Cache Flush Interval	4	–	Prohibited
Spinup Drive Count	2	–	Prohibited
Spinup Delay	12	–	Prohibited
StopOnError	[Disabled] Enabled	–	Prohibited
Stop CC On Error	[No] Yes	Specify the operation at error detection in Consistency Check. No: Recover and resume. Yes: Abort	Permitted
Maintain PD Fail History	[Disabled] Enabled	–	Prohibited
Schedule CC	Supported	Set the scheduled consistency check.	Permitted

\*1 Do not perform "Set Factory Defaults". It changes the factory-set values which can no longer be restored afterwards.

## How to change the settings value

On the [Adapter Properties] screen, change the parameter to the desired value, and then click [Submit].

The status of "Battery Backup" is indicated as "Present". Clicking [Present] opens the Battery Status screen shown below.

MegaRAID BIOS Configuration Utility Battery Module		LSI	
<b>Battery Type:</b> iBBU <b>Voltage:</b> XXXXX mV <b>Current:</b> X <b>Temperature:</b> XX deg centigrade <b>Status:</b> Gas Gauge Status : xxxxxxxx Fully Charge Capacity remaining : XX% Design Charge Capacity remaining : XX% Expected margin of error : X%	<b>Design Info</b> <b>Mfg Name:</b> LSIC10000A <b>Mfg Date:</b> MM/DD/YYYY <b>Serial No:</b> XXXX <b>Design Capacity:</b> 880mAh <b>Design Voltage:</b> 4800mV <b>Device Name:</b> 5810-2 <b>Device Chemistry:</b> NiMH	<b>Capacity Info</b> <b>Full Charge Capacity:</b> XXXmAh <b>Remaining Capacity:</b> XXXmAh	<b>Properties</b> <b>Auto Learn Period (days)</b> 30 <b>Next Learn Time</b> XX/XX/XXXX:XX/XX/XX <b>Learn Delay Interval (hrs)</b> <input type="text" value="0"/> <b>Auto Learn Mode</b> <input type="text" value="Disabled"/> <input type="button" value="Go"/>

---

**IMPORTANT:** You cannot change the "Auto Learn Period", "Next Learn Time", and "Learn Delay Interval" values.

---

### NOTES:

- The Status field shows "Charging" when the battery is charged. It shows "Discharging" when the battery is discharged.
  - When powering on the server after the battery replacement, the Status may not immediately change to "Charging". In that case, leave the server powered on for several hours, and check "Status" again.
-

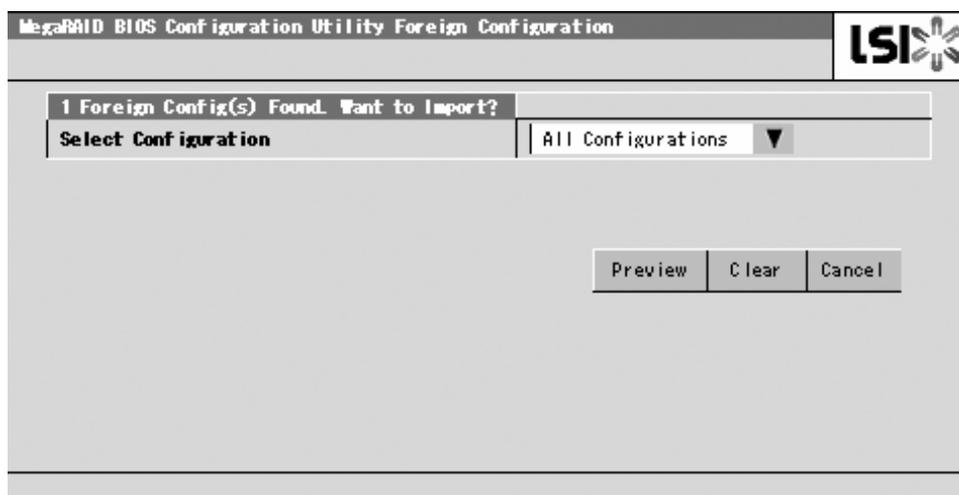
## Scan Devices

When you click [Scan Devices] on the WebBIOS Top Menu, the HDDs connected are detected again. Use this feature if you have installed a new HDD while the WebBIOS was running.

---

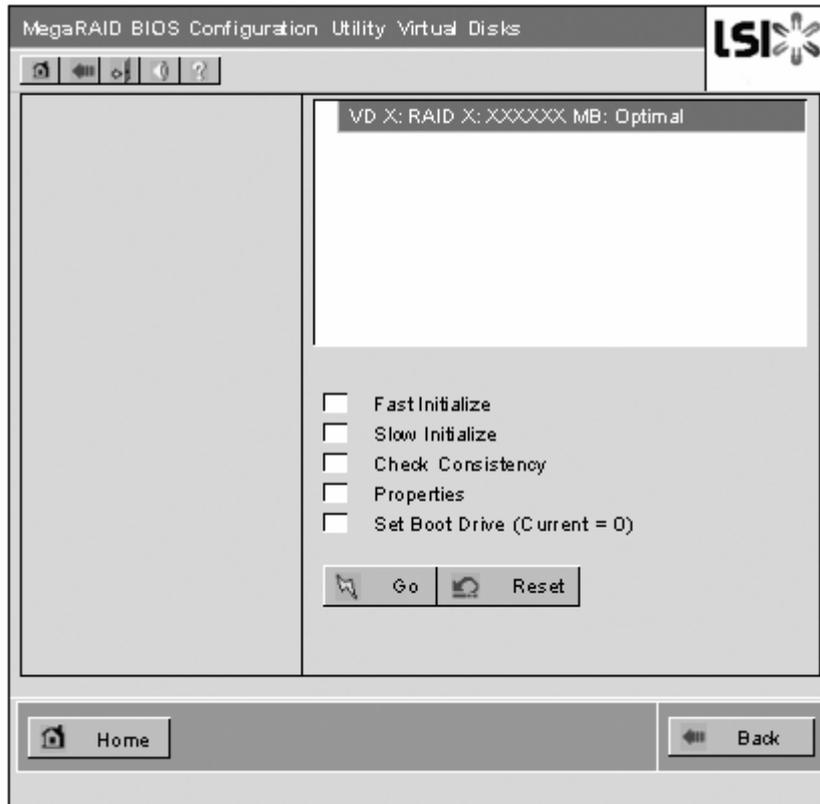
### IMPORTANT:

- If the newly connected HDD contains another configuration information, the [Foreign Configuration] screen shown below appears. To use the HDD as new one, click [Clear] to clear the configuration information in HDD.
  - If you use the Universal RAID Utility to configure a RAID system using the newly connected HDD containing another configuration information, first clear the other configuration information using the Scan Devices feature.  
(\* Universal RAID Utility does not include this feature.)
- 



## Virtual Disks

When you click on [Virtual Disks] on the WebBIOS Top Menu, the screen that appears can be used to operate the configured VD.



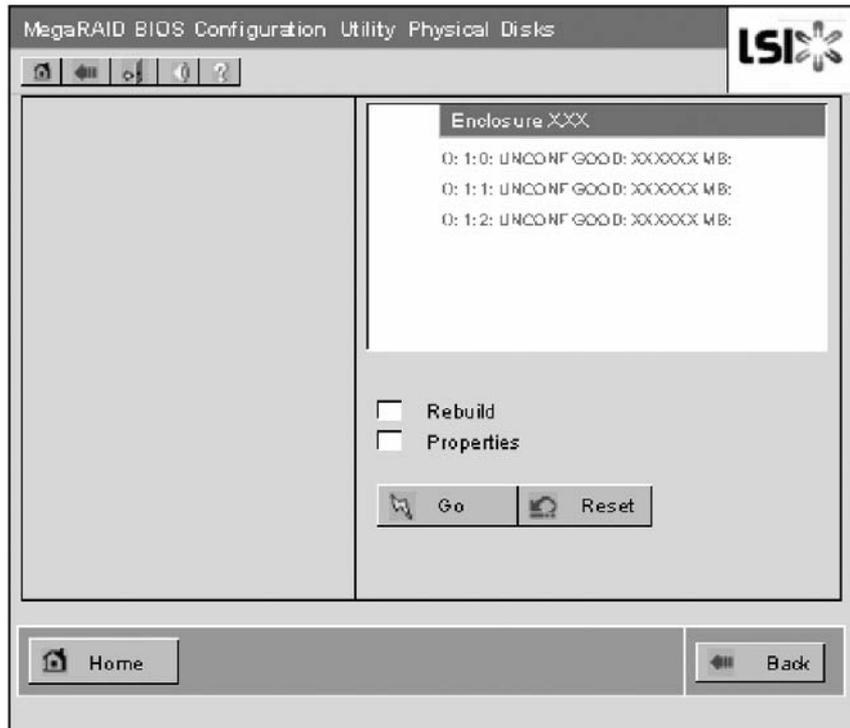
---

**IMPORTANT:** If no virtual disk exists, the upper right column of the screen is blank. Use this menu only when a virtual disk exists.

---

## Physical Drives

When you click on [Physical Disks] on the WebBIOS Top Menu, the screen that appears can be used to operate the physical drive (HDD).



---

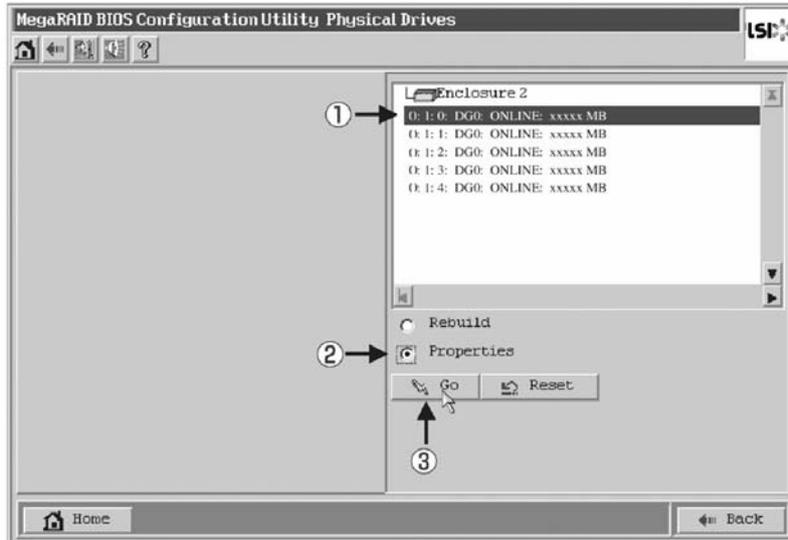
**IMPORTANT:** If no physical disk exists, the upper right column of the screen is blank. Use this menu only when a physical disk exists.

---

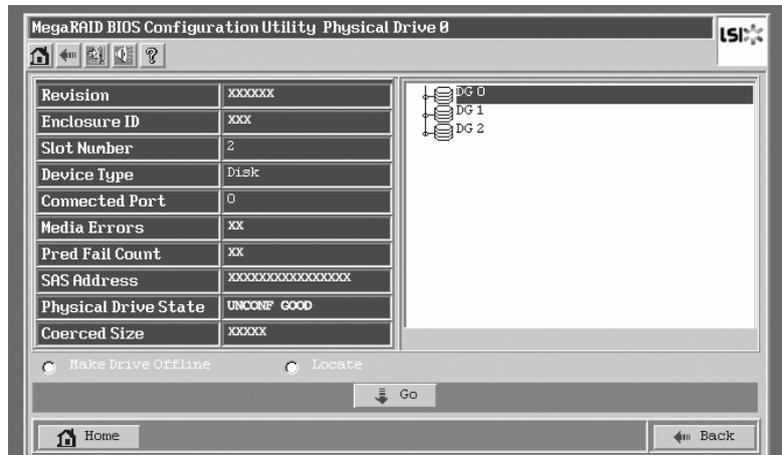
## Physical Drives Properties

Use the following procedure to check the Physical Drive Properties. The example shown below is an example of the physical drive 0:0:0 properties check.

1. Click the Physical Drive you want to check.
2. Click the checkbox for [Properties].
3. Click [Go].



The Properties screen shown below appears.



## Configuration Wizard

Use this wizard to configure a RAID system using the connected HDDs. The detailed explanation of this feature is given in "Configuring Virtual Disk".

## Adapter Selection

This feature is not used in this server.

## Physical View / Logical View

If the virtual disk has been configured using the RAID Controller, the DG (disk group) is displayed on the WebBIOS Top Menu. Clicking [Physical View] displays information for the HDDs in the DG. Clicking [Logical View] displays the virtual disk in the DG.

## Events

The Events screen is used to confirm the system events.

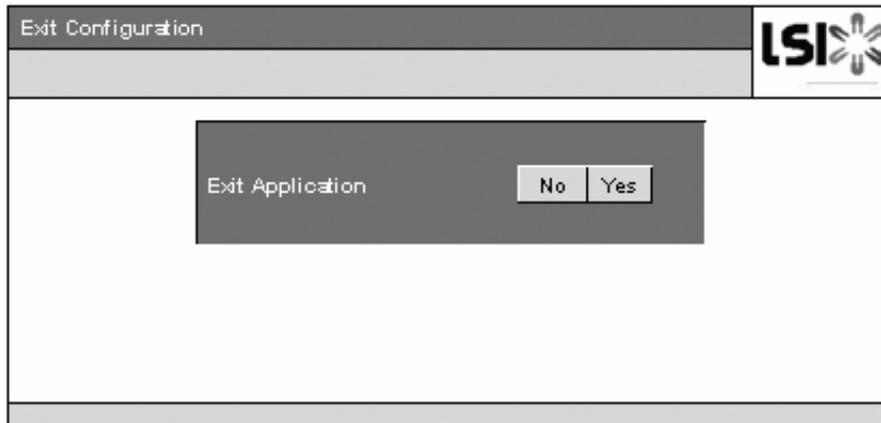
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**IMPORTANT:** The Onboard RAID Controller (MegaRAID ROMB) does not support the Events feature.

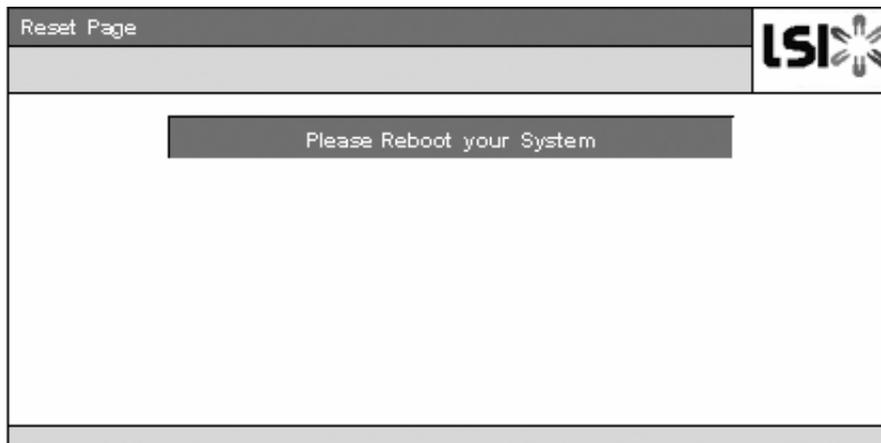
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## Exit

When you click [Exit] on the WebBIOS Top Menu, you are prompted for confirmation. Click [Yes] to exit from WebBIOS.



The screen shown below appears when WebBIOS is terminated. Restart the server.



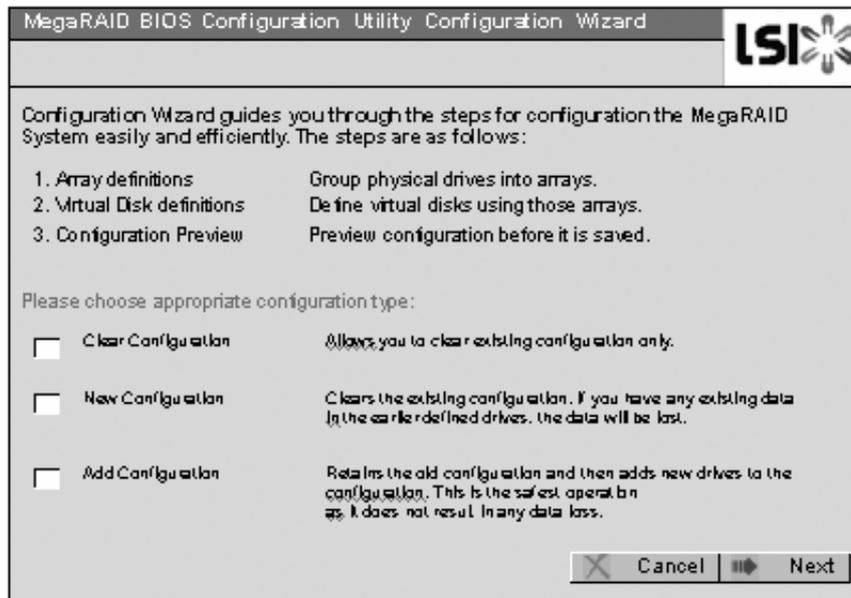
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## Configuring a Virtual Disk

This section describes the procedures for the configuration of a VD (virtual disk) using WebBIOS.

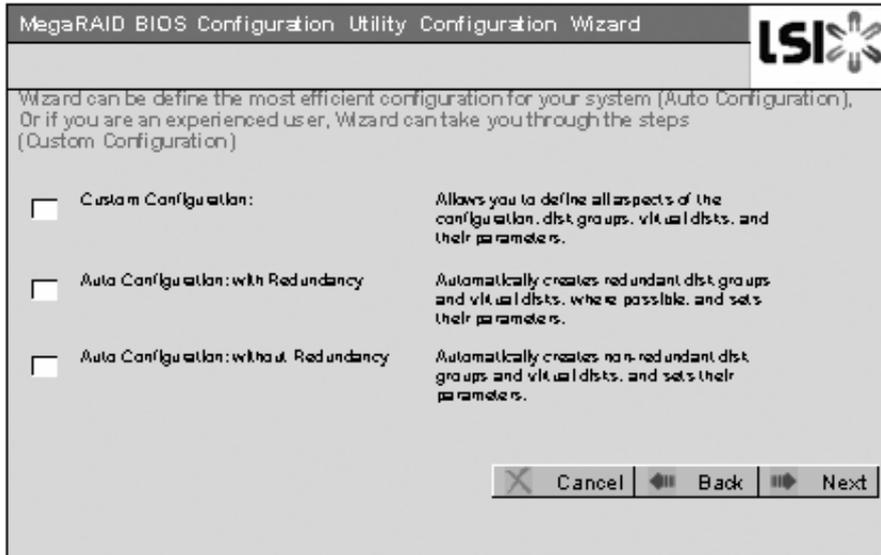
### Configuration Wizard

When you click [Configuration Wizard] on the WebBIOS Top Menu, the screen shown below appears. Select the relevant operation, and click [Next].



Clear Configuration	Allows you to clear the existing configuration.
New Configuration	Clears the existing configuration and creates a new VD. If you have any existing data in the virtual disk defined earlier, the data will be lost.
Add Configuration	Retains the old configuration and then adds a new virtual disk.

When you select [New Configuration] or [Add Configuration], the screen shown below appears.



Custom Configuration: Allows you to define all aspects of the configuration, RAID level, size, and others.

Auto Configuration with Redundancy: Automatically creates a redundant virtual disk.

Auto Configuration without Redundancy: Automatically creates a non-redundant virtual disk.

---

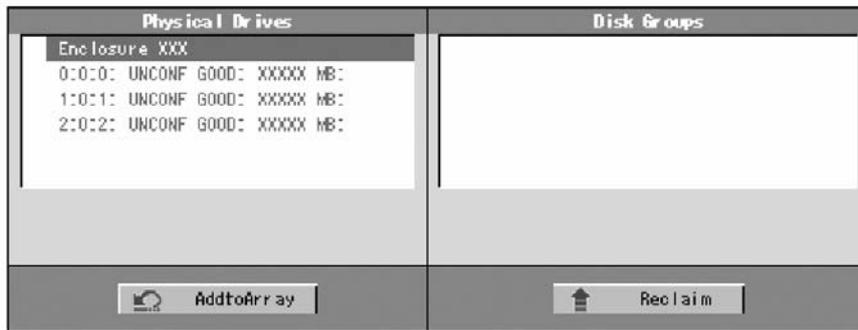
**IMPORTANT:** The Onboard RAID Controller (MegaRAID ROMB) supports only the "Custom Configuration".

---

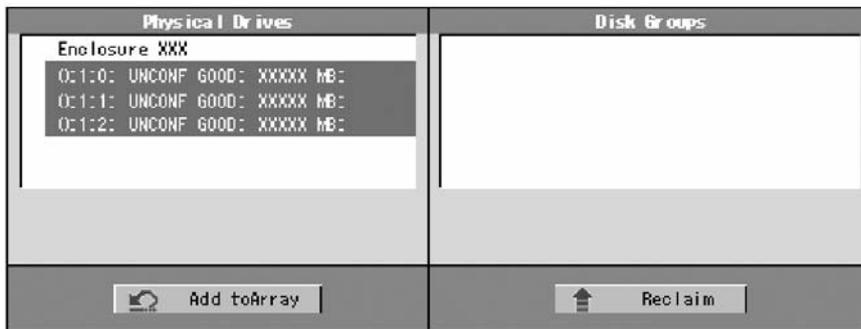
Use this menu to define several physical drives (PD) as a disk group (DG).



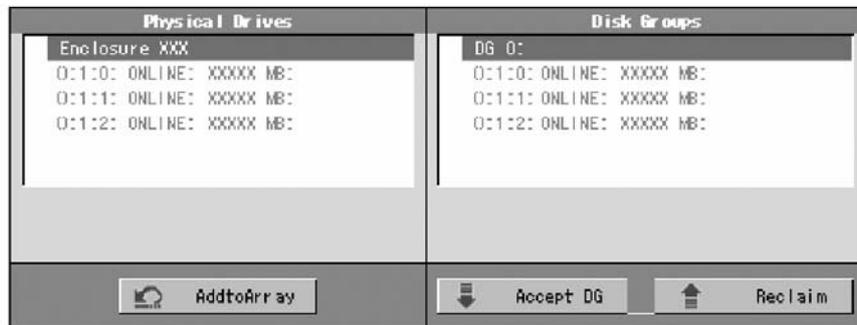
1. To add physical drives (HDDs) to a Disk Group, hold **Ctrl** and select the relevant physical drives (HDDs).



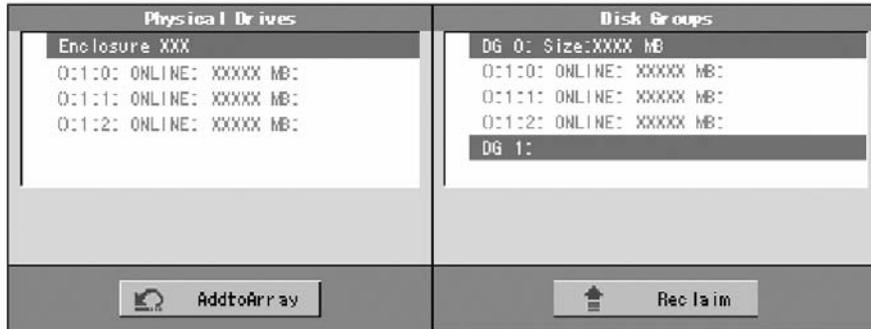
2. Once the selection is completed, click [Add to Array].



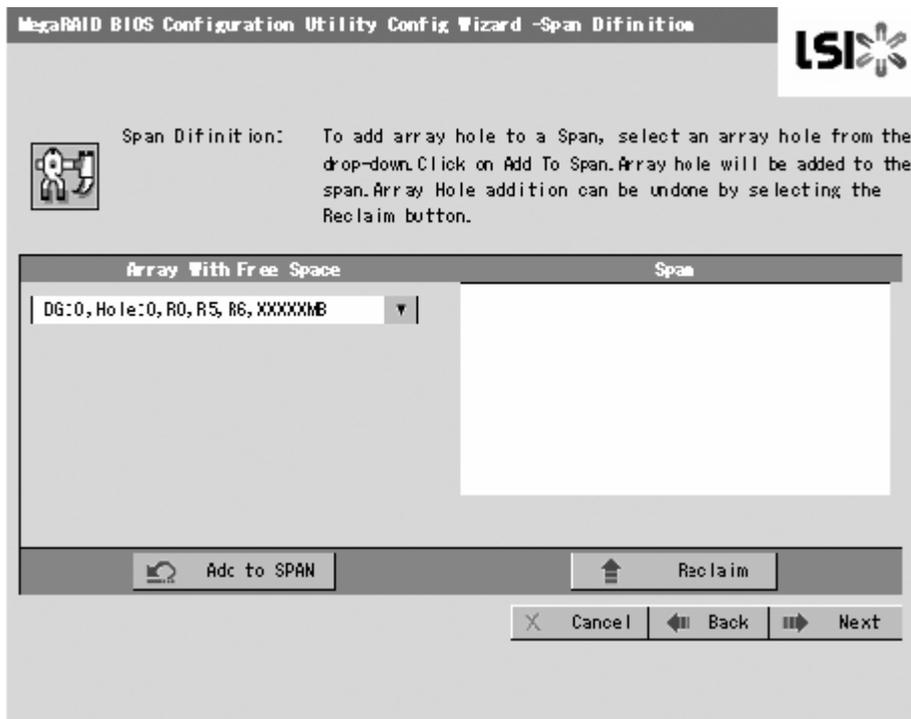
3. A new DG is defined in the Disk Groups frame. To define the new DG, click [Accept DG].



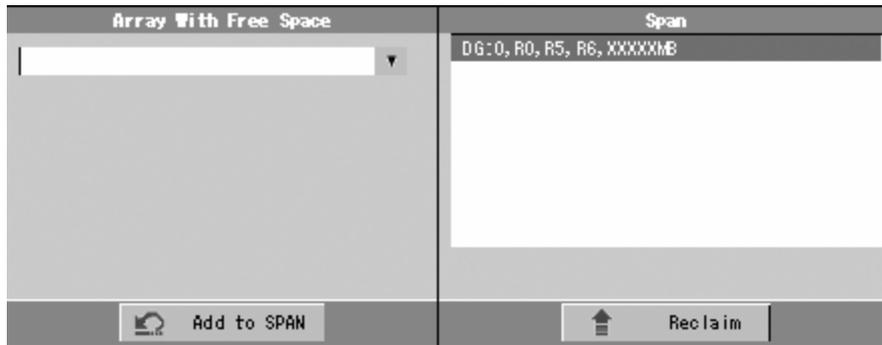
- Once the DG has been defined, click [Next].



- The Span Definition screen is displayed.



6. Select a DG to define a VD from the "Array With Free Space" frame, then click [Add to SPAN]. The DG is defined in the "Span" field to the right.



7. Once the Span has been defined, click [Next] at the lower right of the screen.

---

**IMPORTANT:**

- To configure RAID0, 1, 5, or 6, perform the Span Definition to a single DG only. If you need to perform a Span Definition to several DGs, define the VD for the first DG, then select the next DG to define VD.
  - To configure RAID10 or 50, select several DGs containing the same number of HDDs for the Span Definition.
  - Span Definition cannot be performed to DGs containing a different number of HDDs.
-

Define the virtual disk (VD) in the DG that has been created in previous step.

When the DG is defined, the [VD Definition] screen is displayed. In the "Next LD, Possible RAID Levels" column, the available RAID levels and maximum size for the VD are displayed.

MegaRAID BIOS Configuration Utility ConfigWizard - VD Definition		LSI
RAID Level	RAID 6	<div style="border: 1px solid black; width: 100%; height: 100%;"></div> <p style="text-align: center;">Next LD, Possible RAID Levels R0:XXXXX R5:YYYYY R6:ZZZZZ</p>
Strip Size	64 KB	
Access Policy	RW	
Read Policy	Normal	
Write Policy	WBack	
<input type="checkbox"/> Wrthru for BAD BBU		
IO Policy	Direct	
Disk Cache Policy	Disable	
Disable BGI	No	
Select Size	ZZZZZ MB	
<input type="button" value="Accept"/> <input type="button" value="Reclaim"/>		
<input type="button" value="Cancel"/> <input type="button" value="Back"/> <input type="button" value="Next"/>		

As an example, define a RAID5 VD of yyyyy MB.

1. Specify the necessary parameters in the left column.
2. Enter "yyyyy" in the "Select Size" field.
3. Click [Accept].
4. If you want to define another VD, click [Back] and repeat the steps starting from the Span Definition screen.
5. When the VD definition is completed, click [Next].

MegaRAID BIOS Configuration Utility ConfigWizard - VD Definition		LSI
RAID Level	RAID 0	DG 0
Strip Size	64 KB	VD 0
Access Policy	RW	
Read Policy	Normal	
Write Policy	WBack	
<input type="checkbox"/> Wrthru for BAD BBU		
IO Policy	Direct	
Disk Cache Policy	Disable	
Disable BGI	No	
Select Size	0 MB	

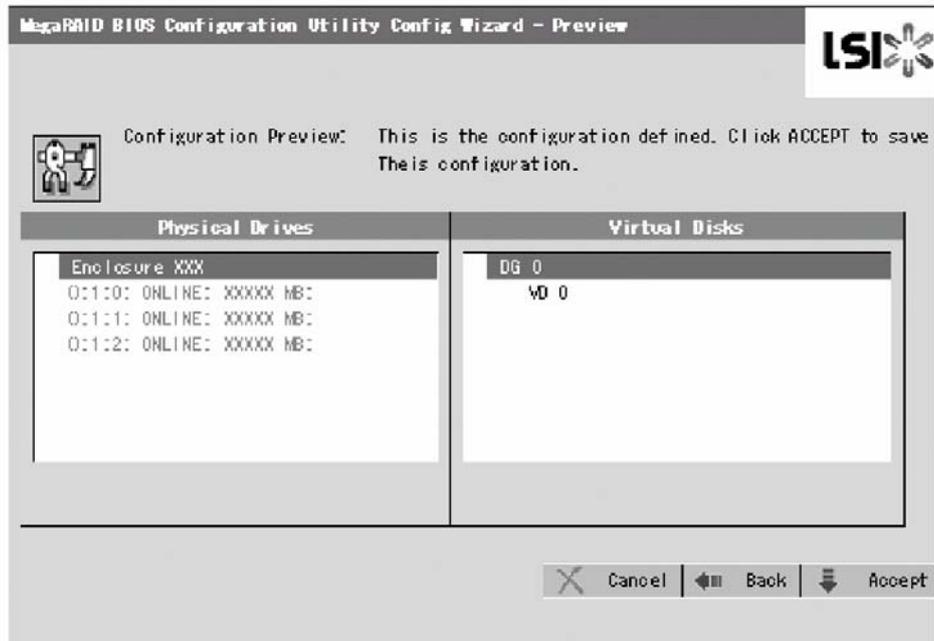
Press Back Button To Add Another VD.

Reclaim

Cancel Back Next

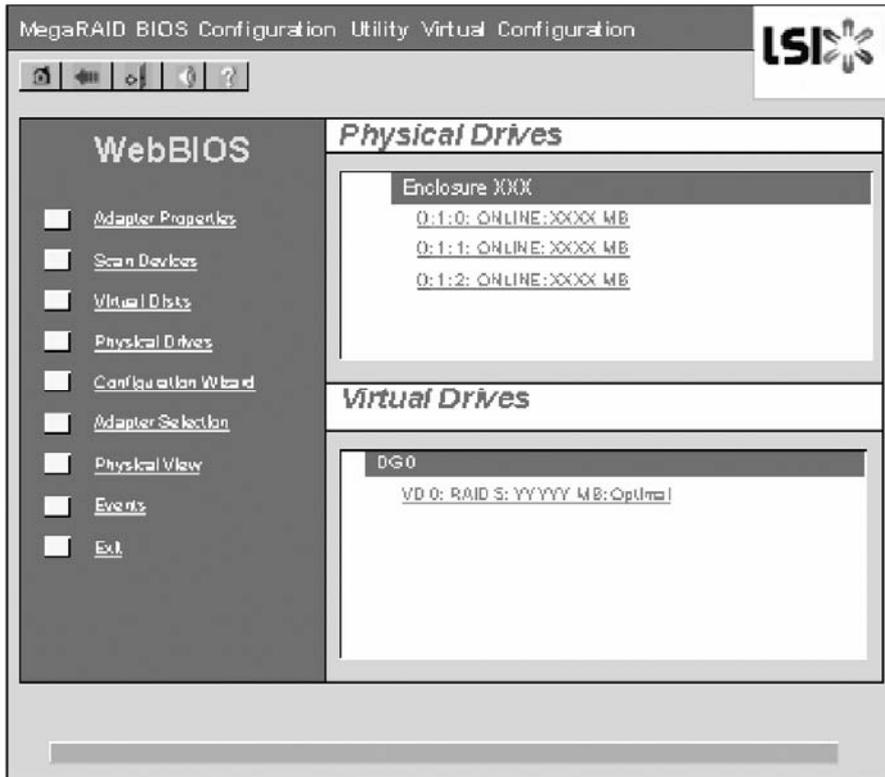
**IMPORTANT:** The value shown in "Select Size" indicates the maximum size allowed for RAID1 or RAID6. You need to specify the maximum size for RAID0 or RAID5 according to "Next LD, Possible RAID Levels".

6. VD 0 is created in the DG 0 as shown in the screen below.



7. Make sure that the VD parameters are correct, and click [Accept].
8. The confirmation message "Save this Configuration?" appears. Click "Yes" to save the configuration.
9. The confirmation message "All data on the new Virtual Disks will be lost. Want to Initialize?" appears. Select "Yes".
10. The "Virtual Disks" operation screen is displayed. If no other operation is required, click [Home].

11. The WebBIOS Top Menu is displayed. The Virtual Disk you have created is displayed in the lower right frame of the screen.



## Configure SPAN

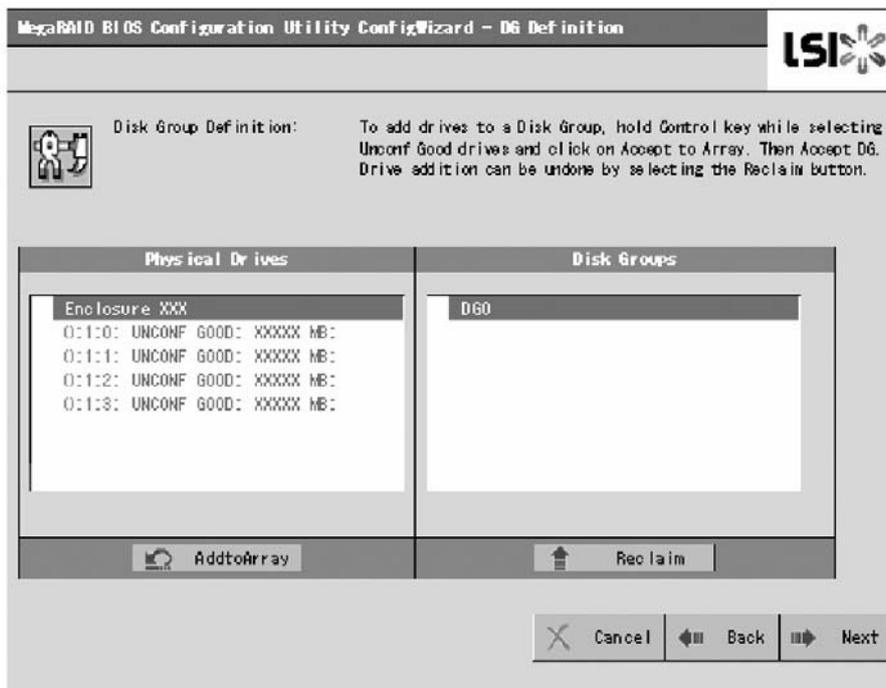
The following explains the sample procedure to configure a RAID10 (spanning of RAID1) with four HDDs.

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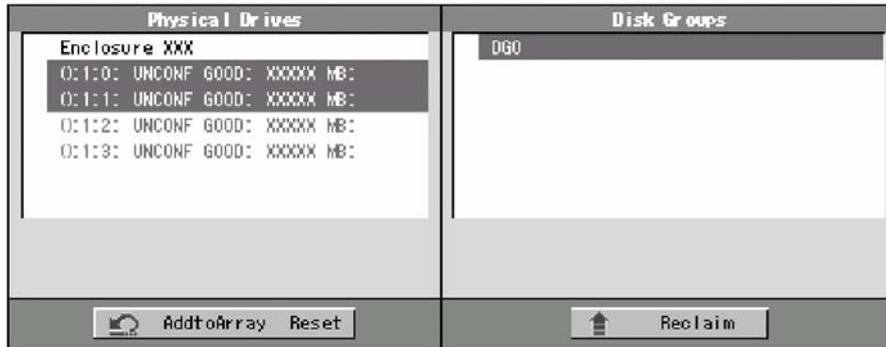
**IMPORTANT:** Do not attempt to configure a RAID00 or RAID60. They are not supported.

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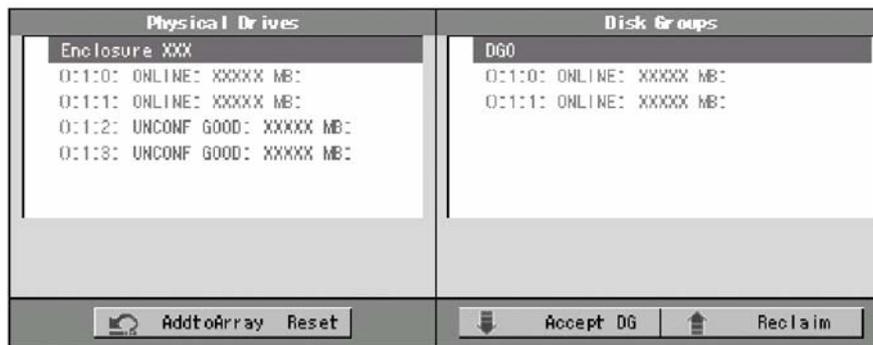
1. Click [Configuration Wizard] on the WebBIOS Top Menu to start the Wizard.



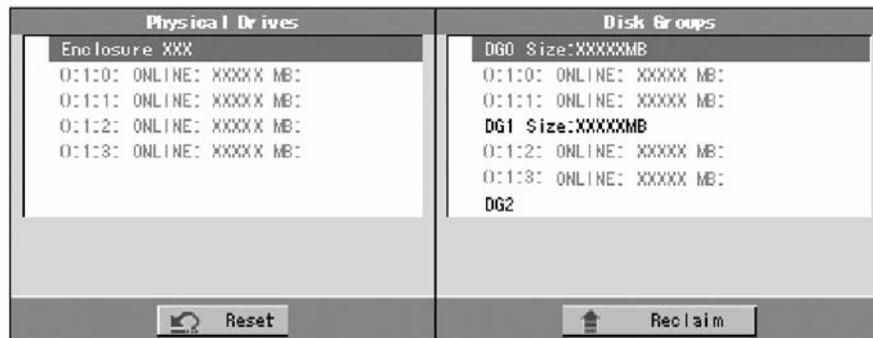
- To add physical drives (HDD) to a Disk Group, hold **Ctrl** while selecting the HDDs in the DG. (In the example, two DGs will be configured and spanned.)



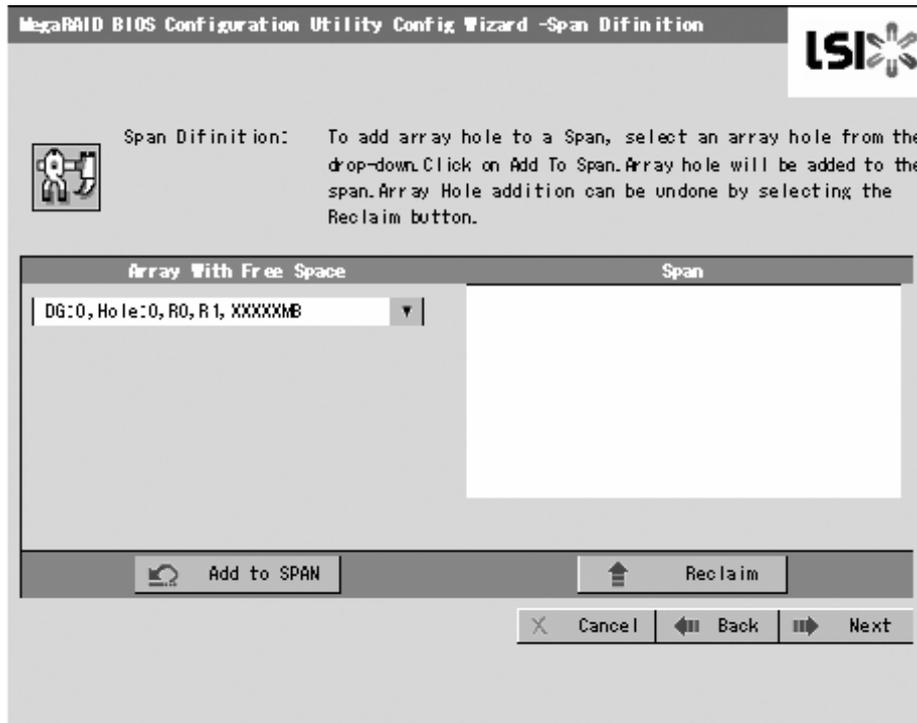
- When the selection is completed, click [Add to Array]. Make sure that the new DG is defined in the Disk Groups frame to the right, and click [Accept DG].



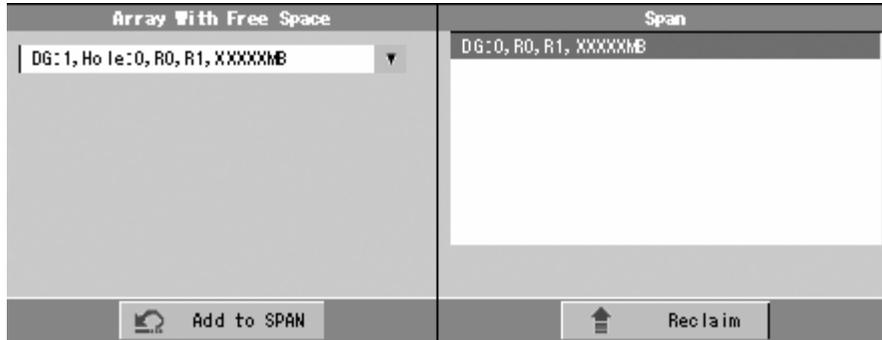
- A new DG is defined in the Disk Groups frame. Define another DG in the same way. Once the DGs have been defined, click [Next].



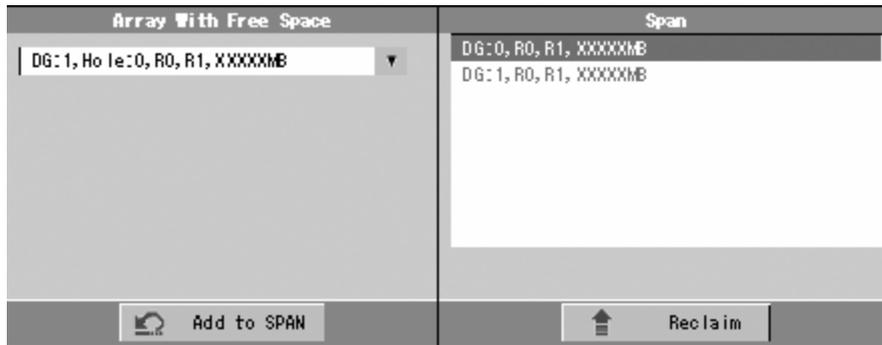
- Configure a RAID10 (spanning of RAID1) using the two DGs that have been created in the previous step. When the DGs are defined, the [VD Definition] screen is displayed.



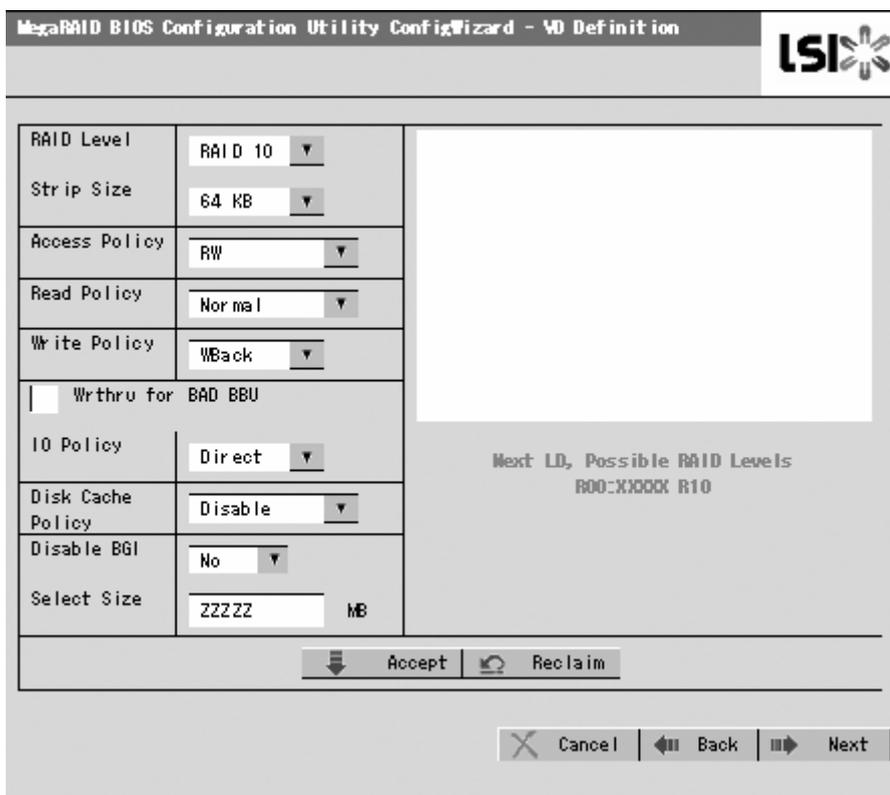
- Select DG0 from the "Array With Free Space" frame, then click [Add to SPAN]. The DG is defined in the "Span" field to the right.



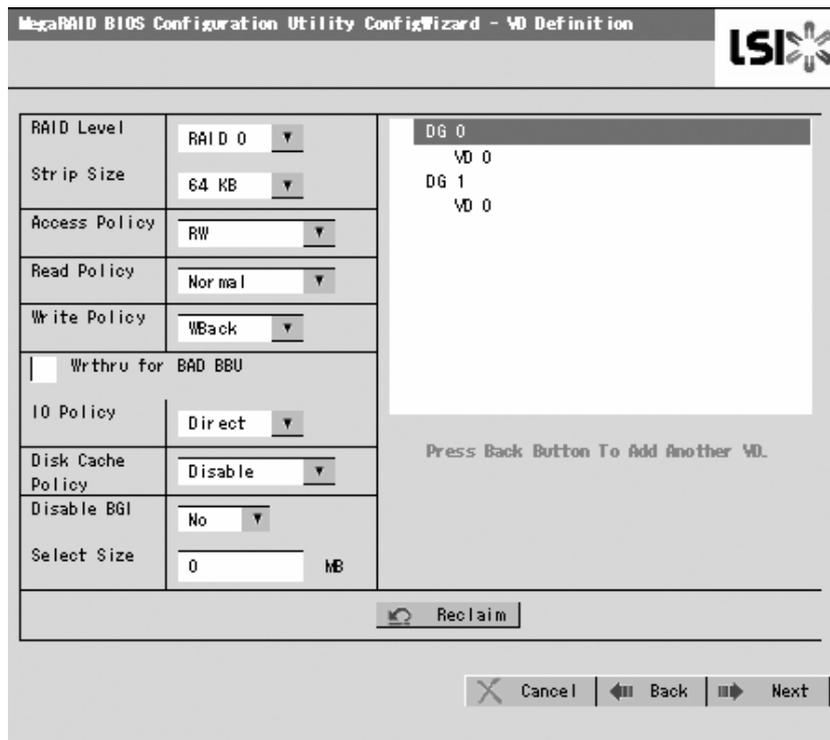
- Select DG1 and click [Add to SPAN]. When the two DGs are defined in the "Span" field to the right, click [Next].



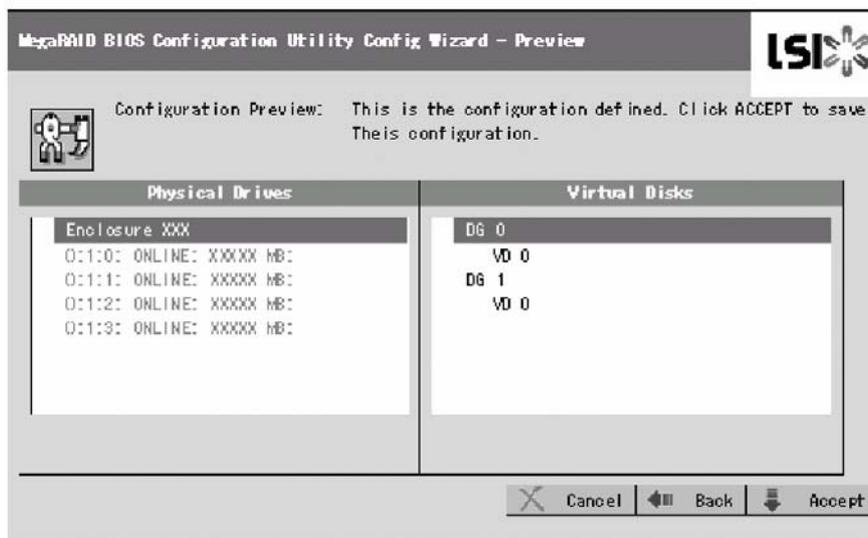
- The VD Definition screen is displayed. Enter the necessary parameters, and click [Accept].



9. Make sure that both DG0 and DG1 are defined as VD 0, and click [Next].



10. On the "Preview" screen, make sure that the VD is defined correctly, and click [Accept].



11. The confirmation message "Save this Configuration?" appears. Click "Yes" to save the configuration.
12. The confirmation message "All data on the new Virtual Disks will be lost. Want to Initialize?" appears. Select "Yes".
13. The "Virtual Disks" operation screen is displayed. If no other operation is required, click [Home].
14. The WebBIOS Top Menu is displayed. The Virtual Disk you have created is displayed in the lower right frame of the screen.

## Parameters for the VD Definition

The parameters listed below are for the Configuration Wizard.

Item	Parameter	Remarks
RAID Level	<b>RAID 0 / RAID 1 / RAID 5 / RAID 6 / RAID 00 / RAID 10 / RAID 50 / RAID60</b>	RAID 00 and RAID 60 are not supported.
Strip Size	8 KB / 16 KB / 32 KB / <b>64 KB</b> / 128 KB / 256 KB / 512 KB / 1024 KB	Recommended value: 64KB
Access Policy	<b>RW</b> / Read Only / Blocked	Recommended value: RW
Read Policy	<b>Normal</b> / Ahead / Adaptive	Recommended value: Normal
Write Policy	<b>WBack</b> / <b>WThru</b>	WBack: WriteBack WThru: WriteThru
WrtThru for BAD BBU	<b>Checked</b> / Unchecked	Select a mode when WriteBack is specified for Write Policy. Checked: Normal WriteBack Unchecked: Constant WriteBack Recommended value: Checked
IO Policy	<b>Direct</b> / Cached	Recommended value: Direct
Disk Cache Policy	NoChange / Enable / <b>Disable</b>	Recommended value: Disable
Disable BGI	<b>No</b> / Yes	Specify whether to perform Background Initialize after creation of VD. Recommended value: No

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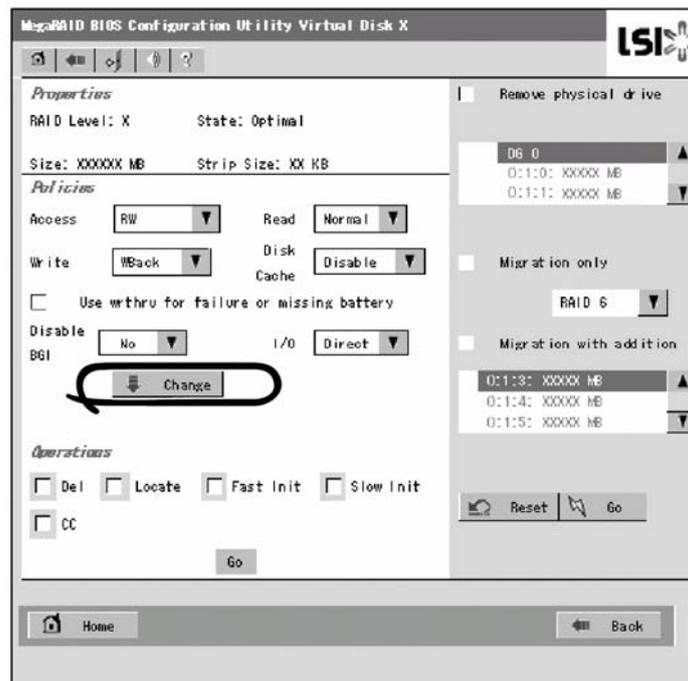
**IMPORTANT:** BGI (Back Ground Initialize) is available only for a RAID5 VD configured with five or more HDDs or a RAID6 VD configured with seven or more HDDs.

---

The Write Policy includes the following modes depending on the combination with WrtThru for BAD BBU. Select a mode suitable for your environment.

		<b>WrtThru for BAD BBU</b>	
		<b>Checked</b>	<b>Unchecked</b>
Write Policy	WBack	<p>Normal write back mode (recommended)</p> <p>This mode is available only when the additional battery backup is installed. The controller uses the cache memory for writing. However, if the battery is being charged or failed, the controller operates automatically in WThru (write through) mode. Thus, this mode can provide higher data security.</p>	<p>Constant write back mode</p> <p>This mode is available even if the additional battery backup is not installed. The controller uses the cache memory for writing. In this mode, the data in cache memory is not protected from damage if a power failure occurs due to a charged/discharged or defective battery. Be sure to use a UPS when specifying this mode for write policy.</p>
	WThru	<p>Write through mode</p> <p>This mode is recommended when the additional battery backup is not installed. The controller does not use cache memory to write the data.</p>	<p>* This mode is unavailable.</p> <p>If you do not check "WrtThru for BAD BBU" at the creation of VD, this item is automatically checked after the VD has been created.</p>

You can change the parameters for the VD definition except for the RAID level and Stripe Size. On the WebBIOS Top Menu, click [Virtual Disks], specify the parameters in the "Policies" frame, and click [Change].

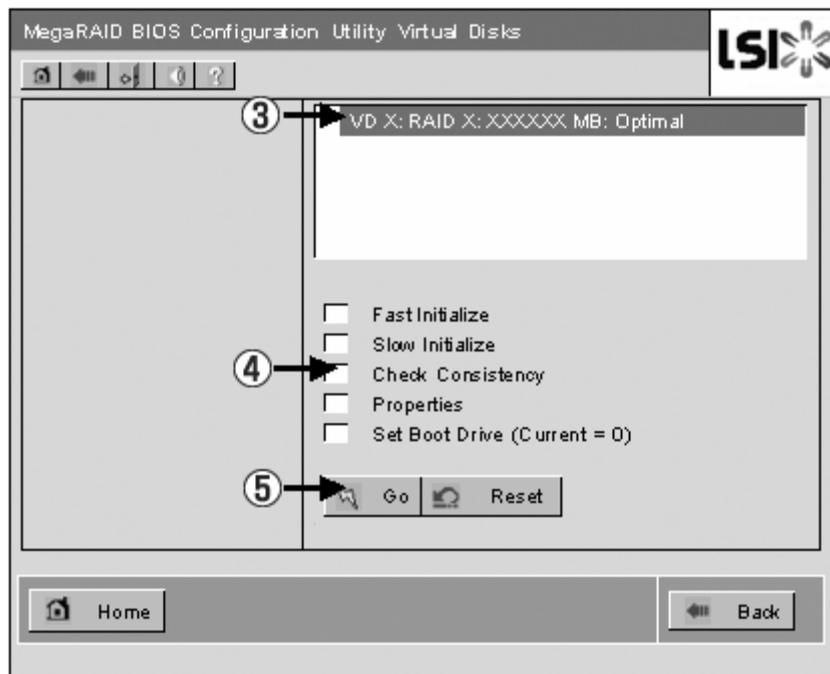


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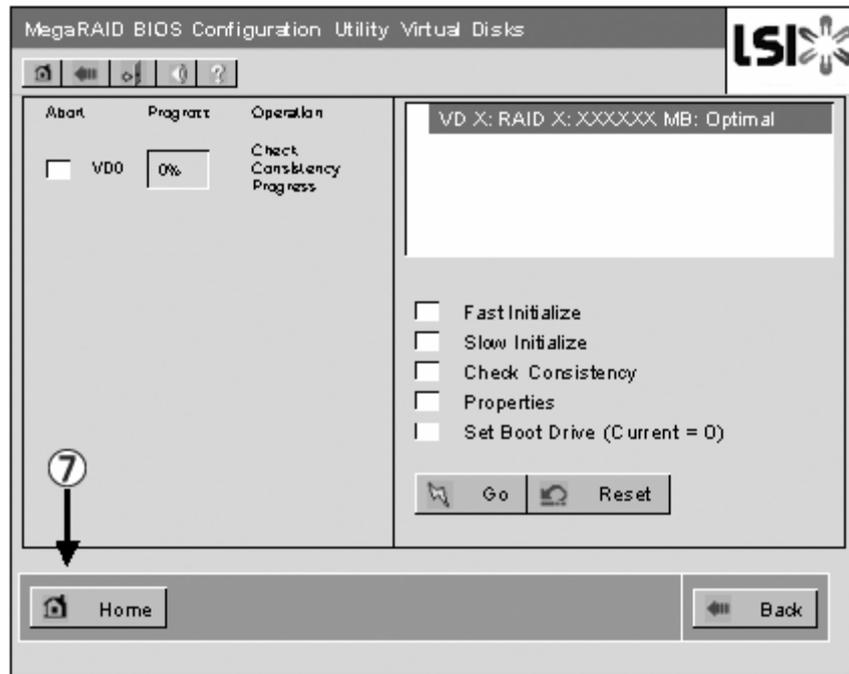
## Operation of the Various Features

### Check Consistency

1. Start WebBIOS.
2. Click [Virtual Disks] on the WebBIOS Top Menu.
3. Select a VD on which to perform a Check Consistency from the upper right frame of the Virtual Disks screen.
4. Click the checkmark column for Check Consistency from the lower right frame of the Virtual Disks screen.
5. Make sure that Check Consistency is checked, and click [Go].



6. The Check Consistency progress is displayed on the left frame of the Virtual Disks screen.
7. Click [Home] to return to the Top Menu.



---

**IMPORTANT:** Click [Home] while a background task such as Consistency Check, Rebuild, or Reconstruction is being executed. When the progress indication is displayed, the background task may process at a slower rate.

---

## Manual Rebuild

The procedures described below are based on the following assumption:  
One of the HDDs failed in a RAID5 virtual disk configured with three HDDs.

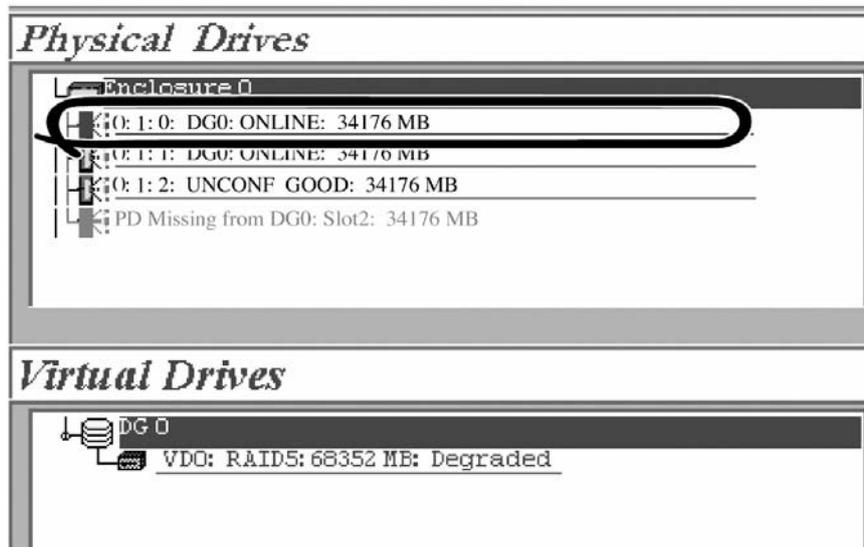
Power off the server and replace the failed HDD with a new one. The Auto Rebuild feature is disabled for non-hot-swap replacement. Use the Manual Rebuild feature to recover the virtual disk as described below.

1. Start WebBIOS.

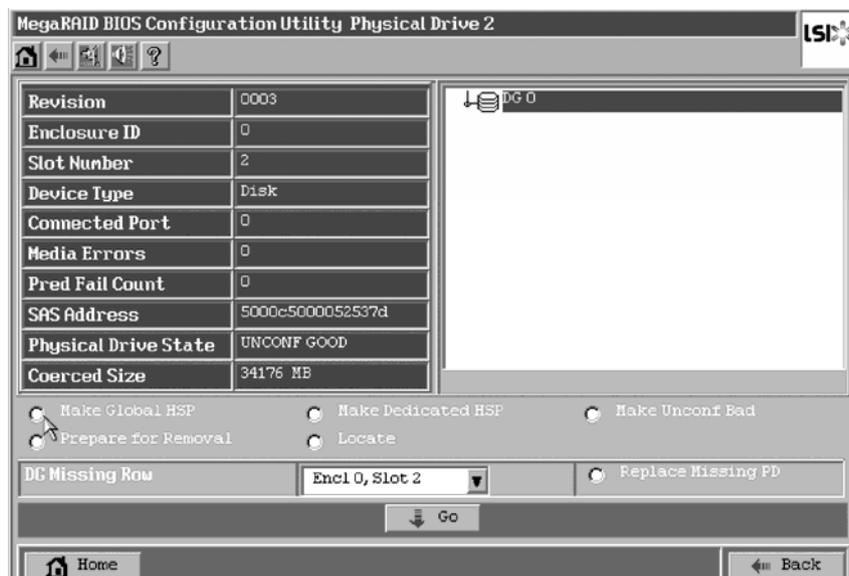
Make sure that the status for the replaced HDD is indicated as "UNCONF GOOD" in the right frame of the Top Menu.

In the example below, the hard disk drive in slot number 2 has been replaced.

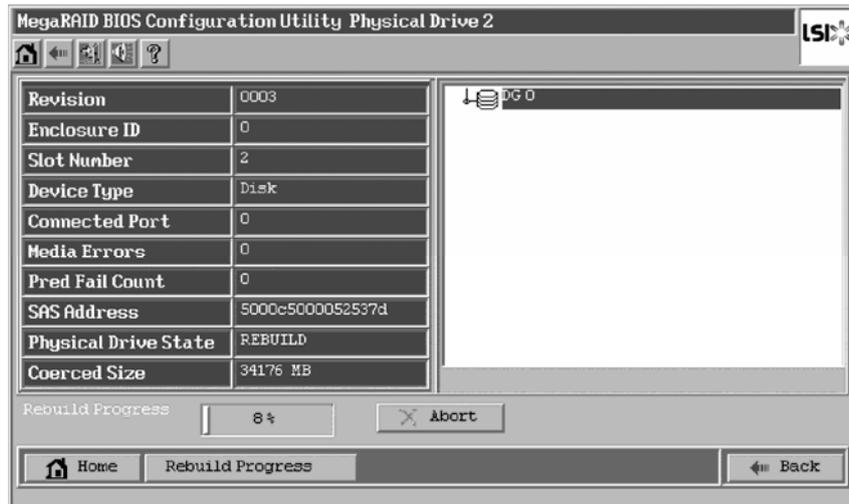
The indication "PD Missing from DGx: Slot 2: xxxxx MB" indicates that the PD (physical drive) installed in slot number 2 was removed.



2. Select "2:0:2" (newly connected HDD) in [Physical Drives].
3. The properties for the Physical Drive are displayed.
4. Select "Make Global HSP" or "Make Dedicated HSP", and then click [Go].



5. When the [Rebuild Progress] is displayed, click [Home] to go back to the WebBIOS Top Menu.



---

**IMPORTANT:** Click [Home] while a background task such as Consistency Check, Rebuild, or Reconstruction is being executed. When the progress indication is displayed, the background task may process at a slower rate.

---

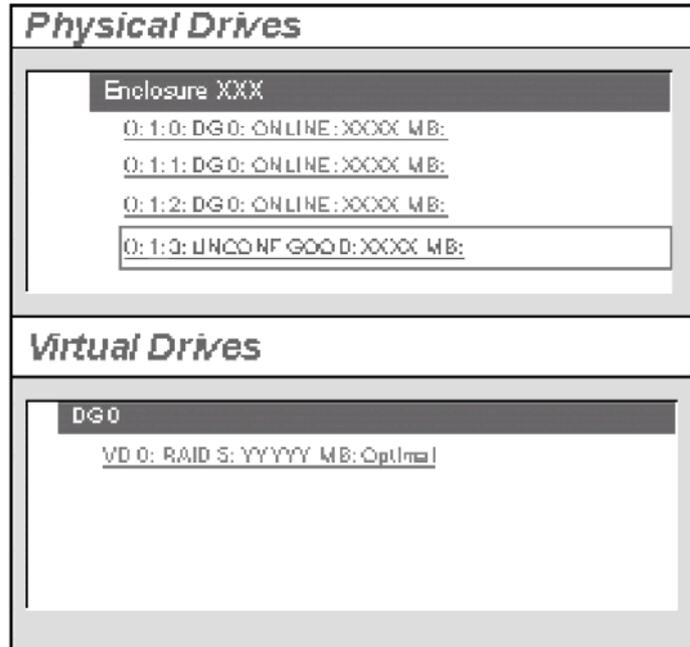
## Setting Hot Spare

The procedures described below are based on the following assumption:

Add a HDD to a RAID5 virtual disk configured with three HDDs and assign a newly added HDD as Hot Spare.

1. Start WebBIOS.

Make sure that the status for the added HDD is indicated as "UNCONF GOOD" in the right frame of the Top Menu.

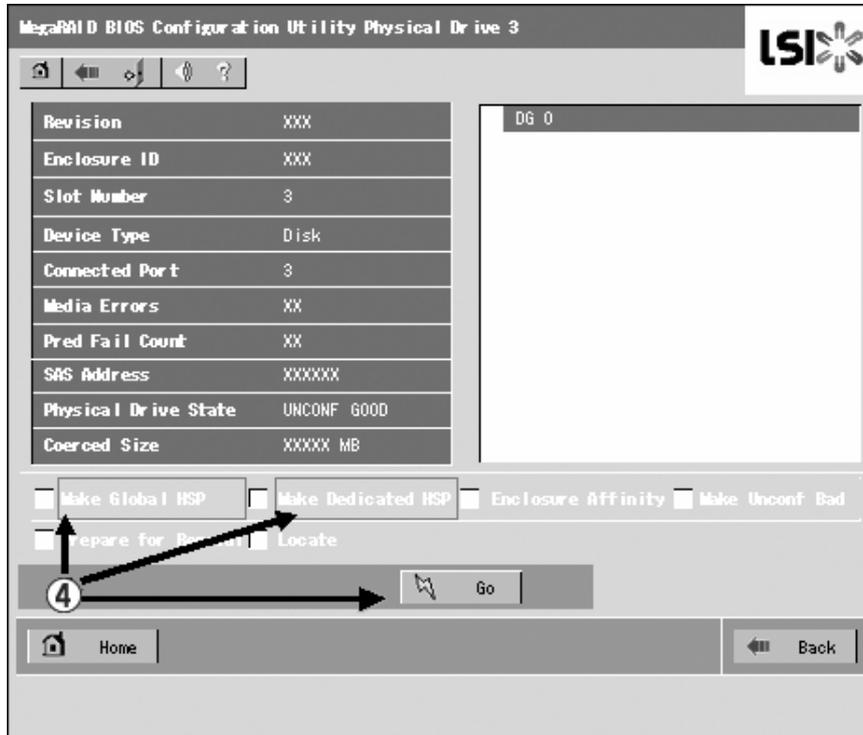


2. Select "3:0:3" (newly connected HDD) in [Physical Drives].
3. The properties for the Physical Drive are displayed.

4. Select [Make Global HSP] or [Make Dedicated HSP], and then click [Go].

Global HSP: Indicates the Hot Spare available for all the DGs.

Dedicated HSP: Indicates the Hot Spare available only for the specific DG. You need to specify the target DG.

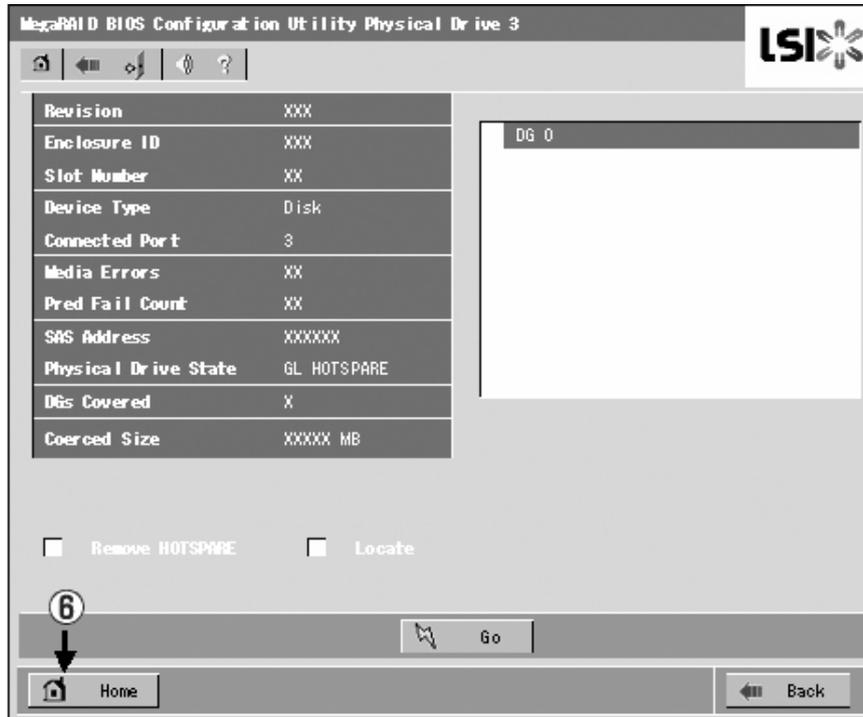


---

**NOTE:** Do not check "Enclosure Affinity" which defines the hot-spare to the specific enclosure. This setting is not supported by the system.

---

5. The status for the newly connected HDD changes to "HOTSPARE".
6. Click [Home] to go back to the WebBIOS Top Menu.



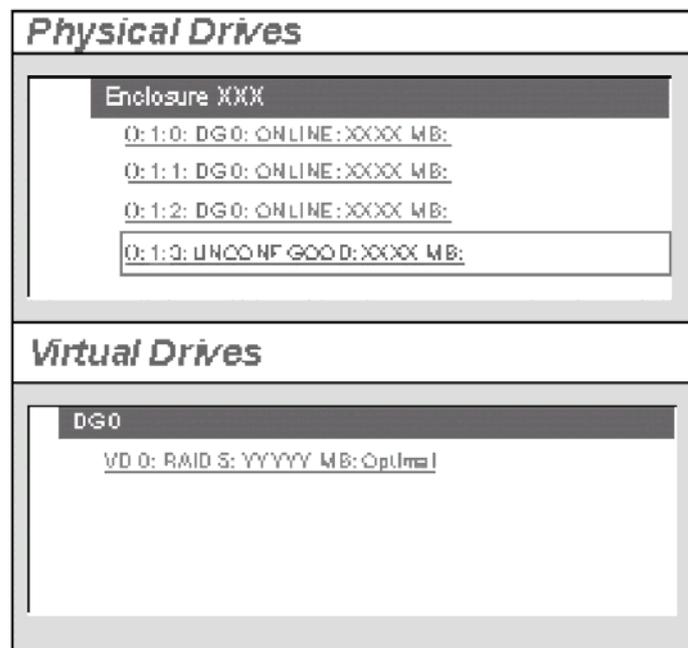
## Reconstruction

The procedures described below are based on the following assumption:

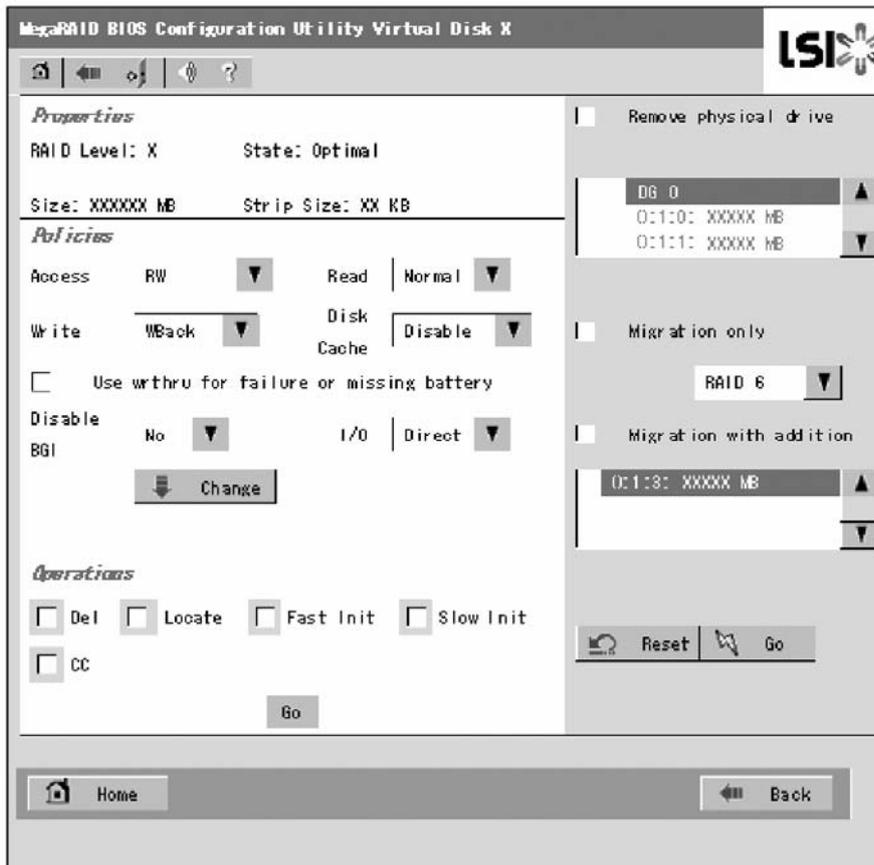
Add a HDD to a RAID5 virtual disk configured with three HDDs to make a RAID5 virtual disk configured with four HDDs.

1. Start WebBIOS.

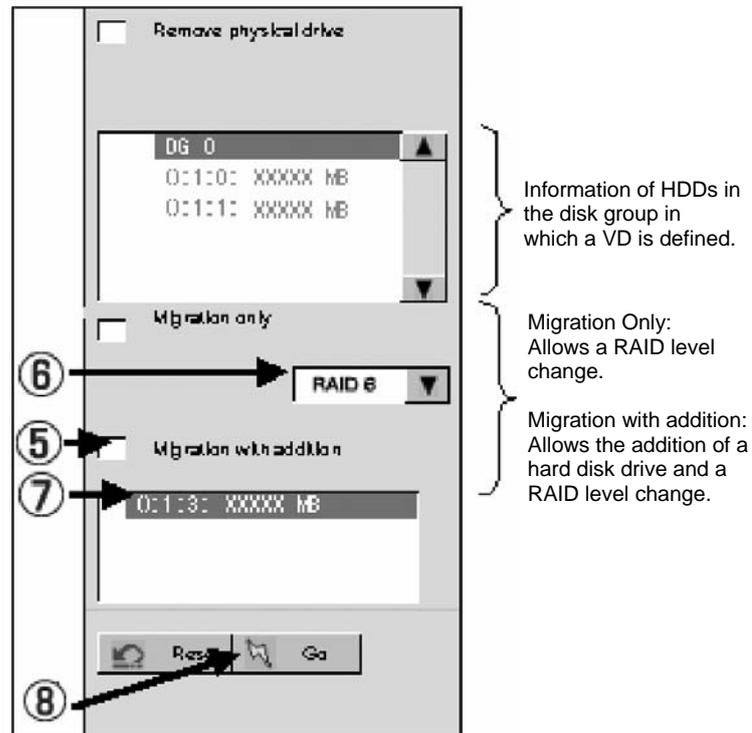
Make sure that the status for the added HDD is indicated as "UNCONF GOOD" in the right frame of the Top Menu.



2. Select "VD 0" (already been constructed) in [Virtual Drives].
3. The Setting menu for the VD 0 is displayed.



- On the right of the screen, the items required for the reconstruction are displayed.



- Select "Migration with addition".
- Specify the RAID level to be used after the reconstruction.
- Select the HDD to be added.
- When you have finished the steps 5 to 7, click [Go].
- The reconstruction progress is displayed. Click [Home] to return to the WebBIOS Top Menu.

---

**IMPORTANT:**

- The capacity of virtual disk may be incorrectly displayed after reconstruction. In this case, perform Scan Devices from the Top Menu.
  - Click [Home] while a background task such as Consistency Check, Rebuild, or Reconstruction is being executed. When the progress indication is displayed, the background task may process at a slower rate.
-

---

## WebBIOS and Universal RAID Utility

You can use the Universal RAID Utility for the configuration, management, and monitoring of the RAID System from the operating system.

The points to be kept in mind when using the Universal RAID Utility together with WebBIOS are as follows.

### Terms

The WebBIOS and the Universal RAID Utility use a different terminology, as listed below:

Term of WebBIOS	Term of Universal RAID Utility
Adapter	RAID Controller
Virtual Disk	Logical Drive
Disk Group	Disk Array
Physical Drive	Physical Device

### Number and ID

The number to manage each component of the RAID System of Universal RAID Utility is different from the one in WebBIOS.

#### Adapter and RAID Controller

WebBIOS manages the Adapter using a number of 0 origin. You can see an Adapter number in the [Adapter No] field in the [Adapter Selection] menu.

The Universal RAID Utility manages the RAID Controller using a number of 1 origin. You can see a RAID Controller number in the [Number] field in the properties of the RAID Controller on the RAID Viewer or [RAID Controller #X] in the properties of the RAID Controller on the raidcmd command.

You can also see the Adapter number managed by the WebBIOS in the [ID] field in the properties of the RAID Controller by the Universal RAID Utility.

#### Virtual Disk and Logical Drive

WebBIOS manages the Virtual Disk using a number of 0 origin. You can see a Virtual Disk number where [VD X] is displayed in Virtual Drives.

The Universal RAID Utility manages the Logical Drive using a number of 1 origin. You can see a Logical Drive number in the [Number] field in the Logical Drive properties of the RAID Viewer or [RAID Controller #X Logical Drive #Y] in the properties of the Logical Drive on the raidcmd command.

You can also see the Logical Drive numbers managed by WebBIOS in the [ID] field in the properties of the Logical Drive by the Universal RAID Utility.

#### Disk Array

WebBIOS manages the Disk Array using a number of 0 origin. You can see a Disk Array number where [DG X] in displayed in Physical Drives and Virtual Drives.

The Universal RAID Utility manages Disk Array using a number of 1 origin. You can see the Disk Array number in the [Disk Array] field in the Logical Drive properties of the RAID Viewer or [RAID Controller #X Disk Array #Y] in the properties of the Disk Array on the raidcmd command.

#### Physical Drive and Physical Device

WebBIOS manages the Physical Drive using three numbers (Connector number:Enclosure number:Slot number). You can view these numbers shown by [x:x:x] in the Physical Drives box. Note, however, that the Connector number is always shown as "()" because it is not supported by this server. The Enclosure numbers are represented by 1-origin, and

the Slot numbers are represented by 0-origin.

The Universal RAID Utility manages the Physical Device using a number of 1-origin and ID, Enclosure number, Slot number. The numbers of the physical devices connected to the controller are sorted in ascending order based on the ID and assigned with a 1-origin number starting from the smallest number. The ID is of the same value as the Connected Port shown in Physical Drives Properties box in WebBIOS. Enclosure number and Slot number are of 1-origin.

---

**IMPORTANT:**

- Note that the slot numbers shown in the Physical Drives box of WebBIOS are represented by 0-origin numbers, but those in the Universal RAID Utility are 1-origin numbers.
  - The slot numbers for the 2.5-inch disk bay on the front of the server are assigned using 0-origin numbers.
- 

## Priority Setting

WebBIOS displays and sets the Rebuild and Patrol Read Priority, and the Consistency Check Priority of the RAID Controller by percentage. The Universal RAID Utility uses three levels of priority: High/Middle/Low for these.

Item	Setting value of WebBIOS	Universal RAID Utility level
Rebuild Priority Rebuild Rate (WebBIOS)	80 to 100	High
	31 to 79	Middle
	0 to 30	Low
Patrol Read Priority Patrol Read Rate (WebBIOS)	80 to 100	High
	31 to 79	Middle
	0 to 30	Low
Consistency Check Priority Consistency Check Rate (WebBIOS)	80 to 100	High
	31 to 79	Middle
	0 to 30	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 (WebBIOS)	High	90
	Middle	50
	Low	10
Patrol Read Priority Patrol Read Rate (WebBIOS)	High	90
	Middle	50
	Low	10
Consistency Check Priority Consistency Check Rate (WebBIOS)	High	90
	Middle	50
	Low	10

---

**NOTES:**

- WebBIOS can set the BGI Rate (Background Initialize Priority), but the Universal RAID Utility can't.
  - The Universal RAID Utility can set the Initialization Priority. But the LSI MegaRAID™ SAS PCI EXPRESS™ ROMB and the LSI Logic MegaRAID SAS 8480E Disk Array Controller don't have this setting of Initialization Priority function. Therefore, the Universal RAID Utility doesn't display the [Initialization Priority] in the properties of the RAID Controller. It will also fail if you change the Initialization Priority using the raidcmd command.
-

## Creating a RAID 6 Logical Drive

You need to use four or more Physical Devices to create the Logical Drive of RAID 6 using the Universal RAID Utility. If you want to create the Logical Drive from three Physical Devices, you need to use WebBIOS.

---

## Onboard RAID Controller Battery (MegaRAID ROMB)

### Features

Use an optional Additional Battery Backup for the Onboard RAID Controller (MegaRAID ROMB).

With the following features, the possibility of data loss due to an unexpected accident (e.g., an instantaneous power failure which may occur in Write Back mode) can be avoided.

- Backup of data in the cache memory of the RAID Controller
- Improvement of the reliability in the Write Back mode
- Adoption of the reusable nickel hydrogen battery
- You can see the status of Battery using the Universal RAID Utility. See the "Universal RAID Utility User's Guide" included in the EXPRESSBUILDER DVD for more information on how to check the Battery status.

---

**IMPORTANT:** Universal RAID Utility indicates that Cache Mode is [Write Through] when the Battery is being charged or discharged.

---

---

**NOTE:** The Default Write Policy is factory-set to "Write Through". You need to change the policy to "Write Back" after installing a battery.

---

### Refresh Battery (Learn Cycle)

The learn cycle of battery is disabled in this controller. The RAID Controller performs a discharging and charging cycle once when the battery is inserted and immediately after the battery replacement, however, the refresh operation is no longer performed.

# CONFIGURING THE BASE BOARD JUMPERS

With the pre-installed SETUP utility, you can set passwords to protect the data stored in the server against access from unauthorized users. If you forget the passwords, however, you will 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.
  - Use the clip over jumper pins (pins 1 and 2) on the base board.
  - Place the clip over the jumper pins 1 and 2 after use to keep the pin. Placing the clip over any other pins may cause malfunction of the server.
  - Do not change any other switch settings. Any change may cause the server to fail or malfunction.
  - Do not lose the clip.
- 

To clear passwords or the CMOS data, use the jumper switch on the base board of the server.

The following describes the clearing procedure.

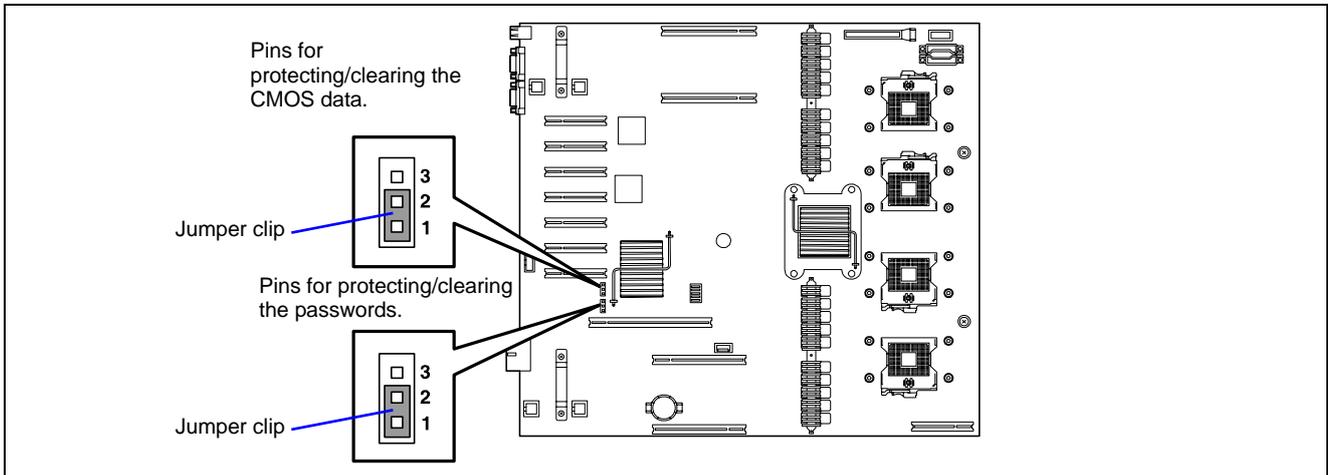
**⚠ WARNING**



Do not disassemble, repair, or alter the server.

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

The following figure illustrates the jumper switch location.



---

## Clearing CMOS Data

1. Record the current BIOS settings.
2. Power off the server and slide the server out of the rack according to Chapter 3. (Pay attention not to disconnect the AC cord.)
3. Remove the server top cover (see Chapter 9).
4. Move the clip to the CMOS clear position. Then put it back over pins 1 and 2.  
Short-circuit pins 1 and 2 to protect the CMOS data.  
Short-circuit pins 2 and 3 to clear the CMOS data.
5. Reassemble the server and press the POWER/SLEEP switch.
6. Run the BIOS SETUP utility and restore the parameter settings recorded in Step 1.
7. Save and exit the SETUP utility.

---

## Clearing Password

1. Power off the server and unplug the power cord.
2. Slide the server out of the rack according to Chapter 3.
3. Remove the server top cover (see Chapter 9).
4. Move the clip to the password clear position.  
Short-circuit pins 1 and 2 to protect the password.  
Short-circuit pins 2 and 3 to clear the password.
5. Reassemble the server and press the POWER/SLEEP switch.
6. When the POST screen appears, power off the server and unplug the power cord.
7. Remove the server top cover.
8. Put the clip back over pins 1 and 2.
9. Reassemble the server and press the POWER/SLEEP switch.
10. Run the BIOS SETUP utility, and set the passwords as needed.
11. Save and exit the SETUP utility.

# Chapter 5

---

## Installing the Operating System with Express Setup

This section provides information on the use of Express Setup to install and configure the following operating systems on the server.

- Microsoft® Windows® Server 2003 Standard Edition / Microsoft® Windows® Server 2003 Enterprise Edition
- Microsoft® Windows® Server 2003 R2 Standard Edition / Microsoft® Windows® Server2003 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 . See Chapter 4 for details.

---

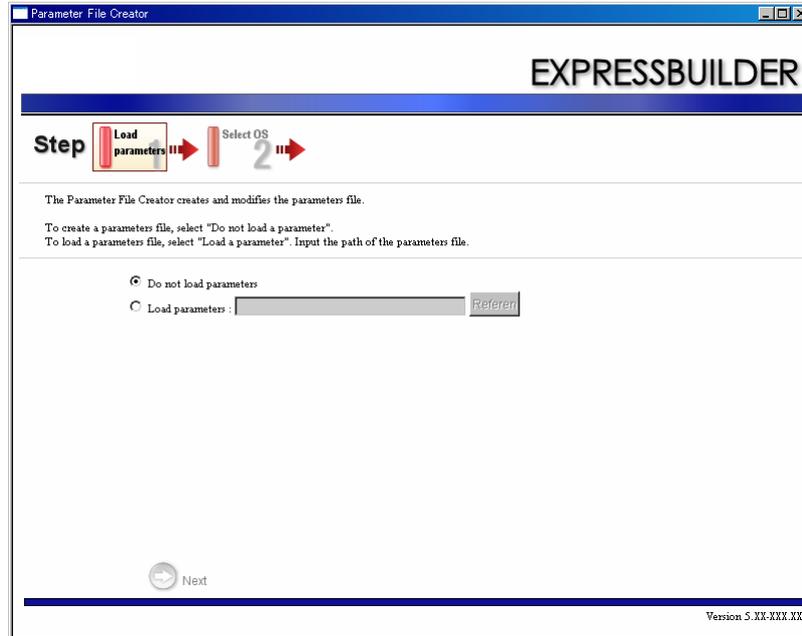
## About Express Setup

"Express Setup" helps you 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 the "Parameters File" during "Express Setup" in order to save or backup the installation parameters.

If you want to set up the server using parameters defined previously, execute the Express Setup using an existing parameters file.

---

### 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 the "Parameter File Creator" included in the EXPRESSBUILDER.
-

## Microsoft Windows Server 2003

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

---

**IMPORTANT:** Be sure to prepare the Windows Server 2003 CD-ROM that includes Service Pack 1.

---

---

### NOTES:

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

---

## Notes on the Windows Installation

Check the following before starting the Express Setup.

### About the Windows family

This computer supports the following Windows editions:

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

---

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

---

To install other OS, contact your sales maintenance representative.

### BIOS Settings

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

### Optional Board Supported by the EXPRESSBUILDER

The EXPRESSBUILDER attached to this computer supports the following optional boards:

---

**NOTE:** If you want to install boards other than the ones listed below by using a driver floppy disk ("OEM-FD for Mass storage device"), see "Exceptional setup" and "Installing Optional Mass Storage Driver" of "Parameter File Creator" in Chapter 6.

---

- Supporting the OS installation in the EXPRESSBUILDER
  - LSI MegaRAID™ SAS PCI EXPRESS™ ROMB (embedded on the motherboard)
- Other optional boards
  - LSI SAS3443E-R SAS Controller
  - LSI Logic MegaRAID SAS 8480E Disk Array Controller (External SAS HDD)

## About the Hardware Components

When you install 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 Windows Server 2003 on the volume that is mirrored using "Disk Management", invalidate the mirroring before the installation, and validate the mirroring again after the installation.

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

### Mounting MO Device

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

### About Removable Media

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

### Connecting Hard Disk Drive

Do not connect other hard disk drives than the drive on which you want to create the Windows system drive.

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

---

**NOTE:** If you connect the LSILogic MegaRAID SAS 8480E Disk Array Controller as a data disk, clear the RAID Controller's configuration information before you perform the Express Setup.

---

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

You cannot re-install Windows Server 2003 if the current partition of the hard disk drive upgraded to Dynamic Disk remains. If you want to keep the current partition, see Appendix E to re-install the system.

## About the System Partition Size

The system partition size can be calculated using 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 with Service Pack1)
	= 3500MB (Windows Server 2003 R2 with Service Pack2)
	= 5300MB (Windows Server 2003 R2 + ServicePack 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). A paging file with an initial size large enough to store the dump file in the boot drive is required.  
The correct debug information might not be able to be collected due to a virtual memory shortage if the paging file is insufficient, so set a size large enough for 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 wish to install any application program or the like, add the necessary space to the partition to install these programs.
- 

For example, if installed memory size is 512 MB, the minimum required partition size is:

$2900 \text{ MB} + (512 \text{ MB} * 1.5) + (512 \text{ MB} + 12 \text{ MB}) = 4192 \text{ MB}$ .

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 Appendix F and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.

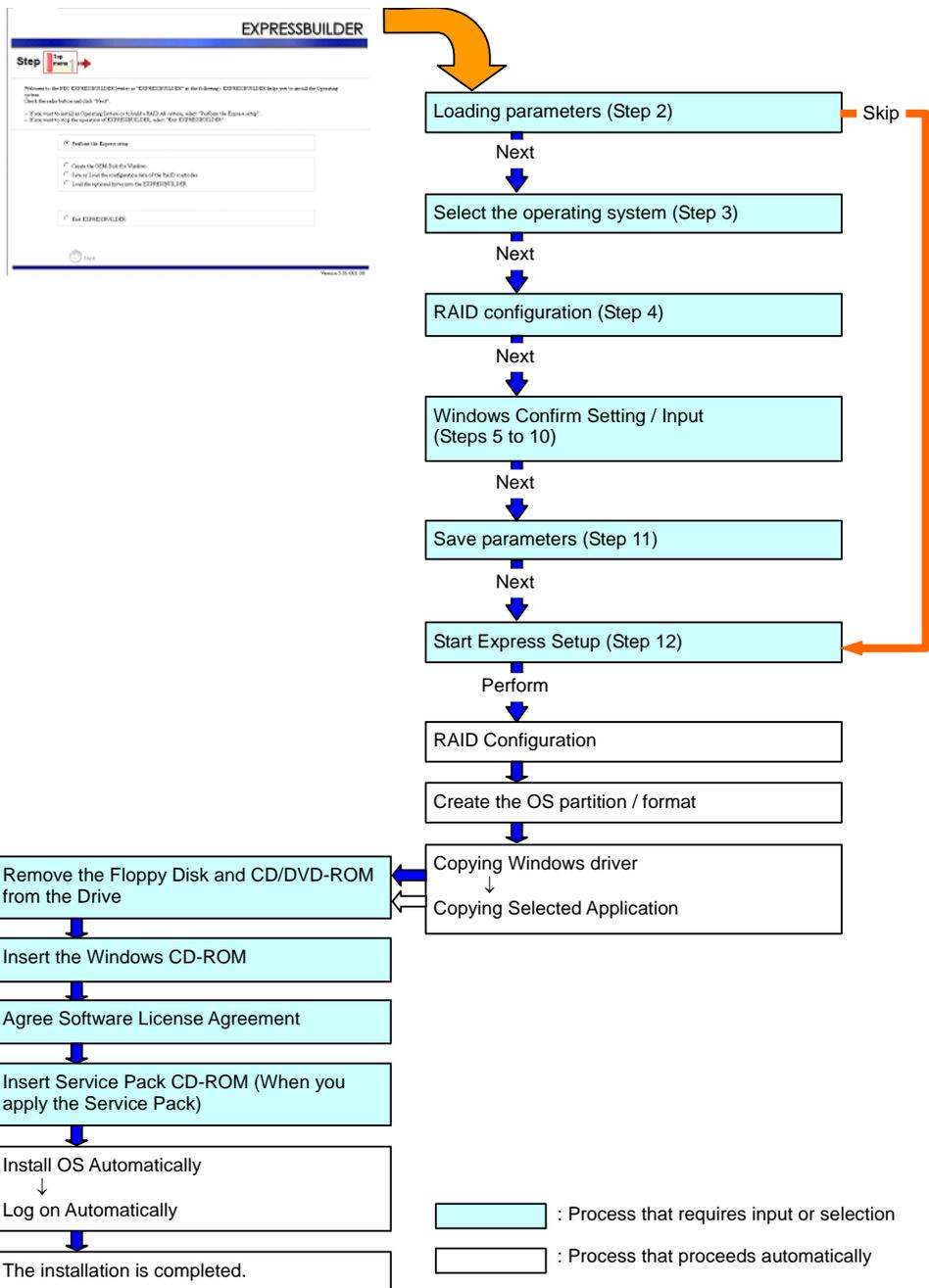
(If the disk does not have enough free space to enable the file size to be written, then after installing the system using the "Size required for installation + Paging file size," install an additional new disk.)

## Installing the Service Pack

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

# Setup Flow

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



---

## Installing Windows Server 2003

Express Setup proceeds with 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.

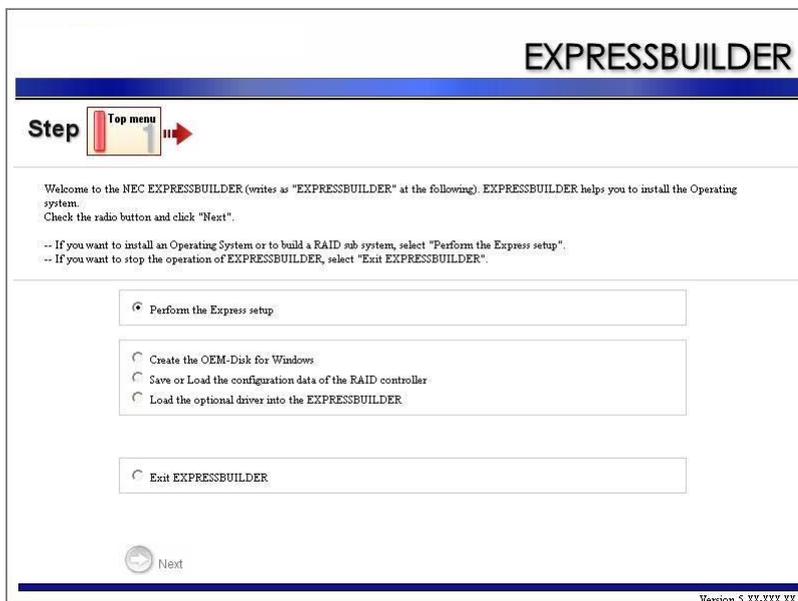
1. Turn the power of peripheral device on, and then turn on the server.
2. Insert the EXPRESSBUILDER DVD into the CD-RW/DVD-ROM drive of the server.
3. Press the RESET switch or press **Ctrl, Alt,** and **Delete** to reboot from the EXPRESSBUILDER. (You may also turn off and then on again to reboot the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

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

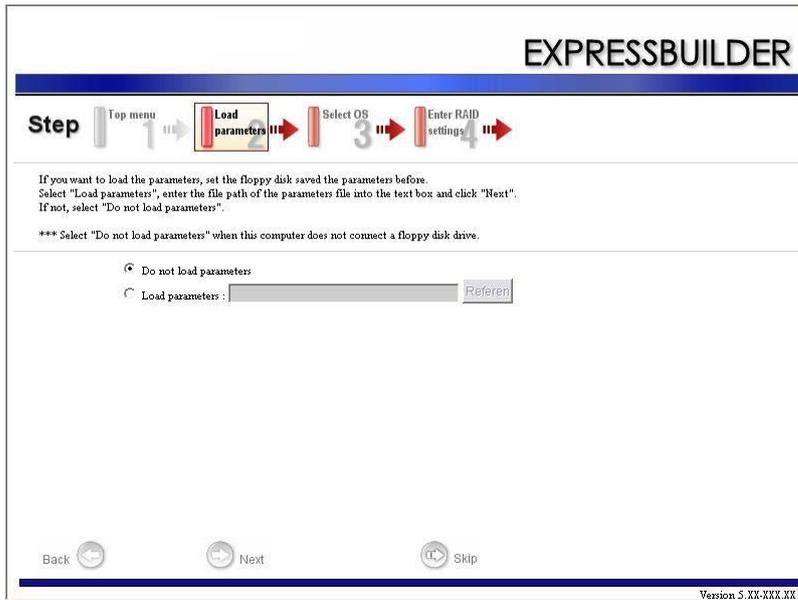
Select "OS installation \*\*\* default \*\*\*" from the boot selection menu. (If you do not hit any key, "OS installation" is selected automatically.)

The Top menu appears.

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



5. The [Load parameters] step is displayed.



[Do not load parameters]

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

---

**NOTE:** If no floppy disk drive is connected, select this item.

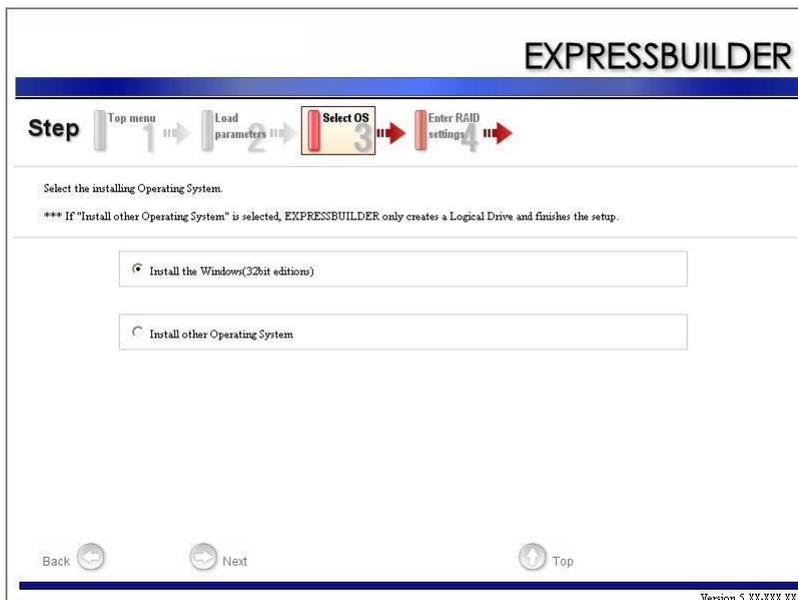
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[Load parameters]

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

6. Select the installing Operating System.

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





---

**IMPORTANT:**

- About the partition size
  - Specify a partition size larger than the required minimum size for the OS installation.
  - Do not specify partition size larger than the capacity of the connected hard disk drive.
- If you select "Create a new partition" at "Windows system drive settings", the contents of the hard disk will be all deleted.
- If "Use existing partitions" is selected, EXPRESSBUILDER installs the Operating System to the 1st partition (the 1st partition contents are 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 an existing partition that is upgraded to Dynamic Disk. Do not select "Use existing partitions" at "Windows system drive settings".
- 

**9. Enter the user information, time zone and client license mode.**

The [Enter basic parameters] step is displayed. Confirm the parameters, modify if necessary, and click [Next].

**EXPRESSBUILDER**

Step | Top menu | Load parameters | Select OS | Enter RAID settings | Specify medium/partition | **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 : 5

Per user or per device mode

Back Next Top Default

Version 5.XX-XXX.XX

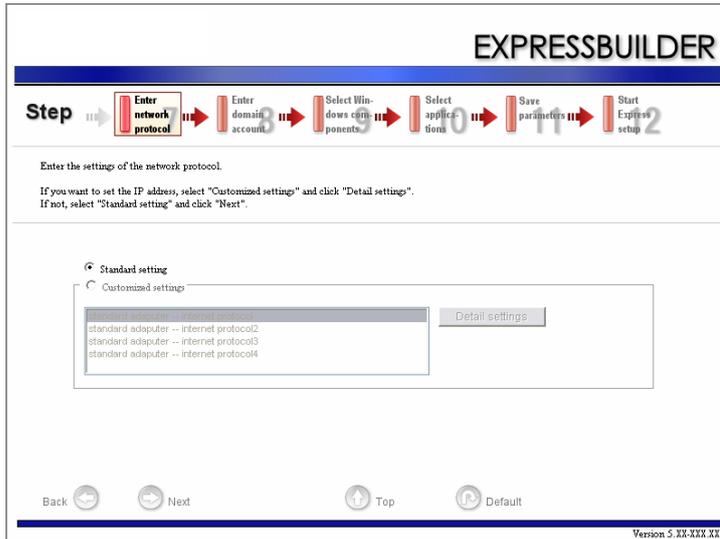
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**NOTE:** Even if you do not input a value into "Administrator password", "Confirm password", "?????" is displayed.

---

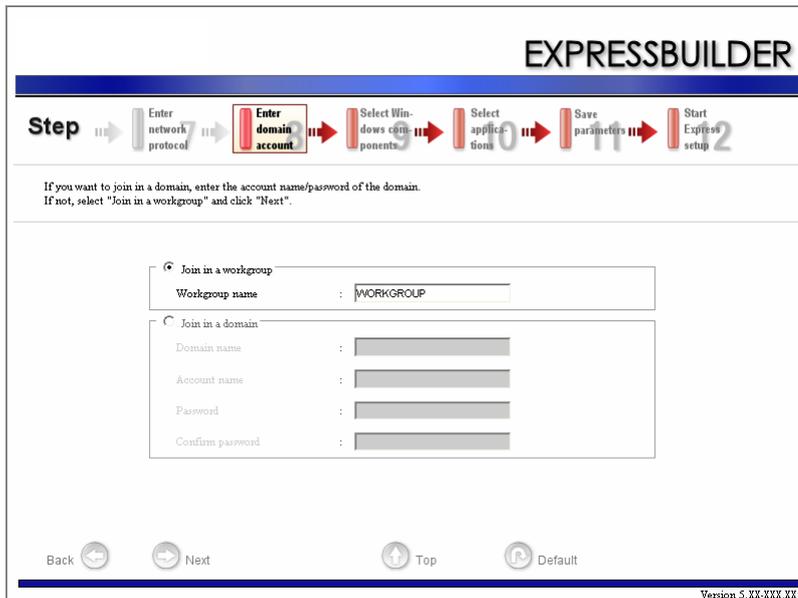
10. Enter the network protocol settings.

The [Enter Network Protocol] step is displayed. Confirm the parameters, modify if necessary, and click [Next].



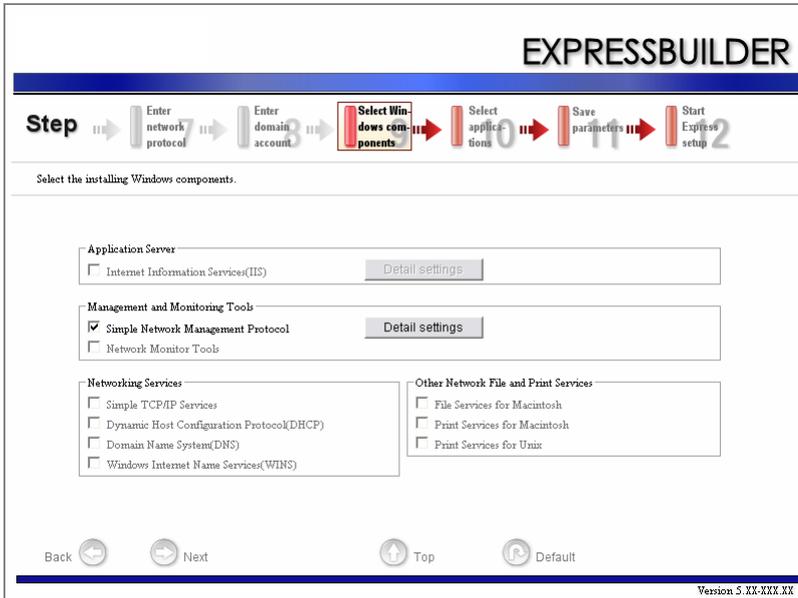
11. Enter the domain or workgroup name to be used.

The [Enter domain and account] step is displayed. Confirm the parameters, modify if necessary, and click [Next].



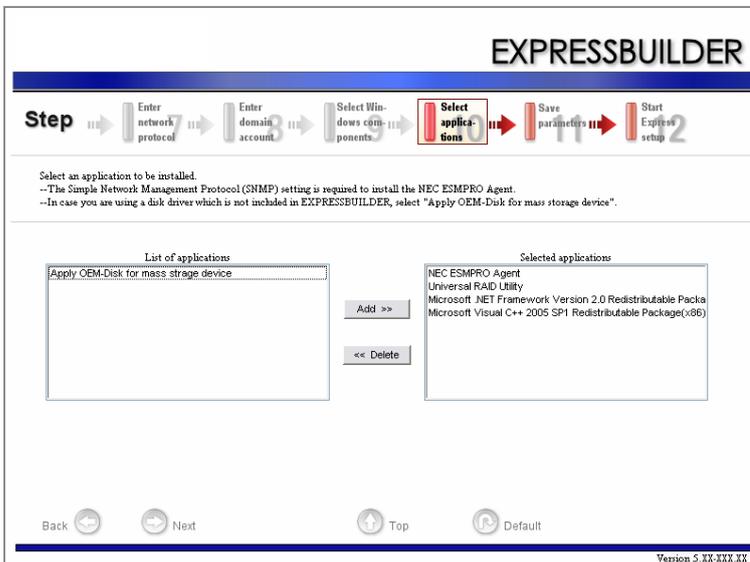
12. Select the installing components.

The [Select Windows component] step is displayed. Confirm the parameters, modify if necessary, and click [Next].



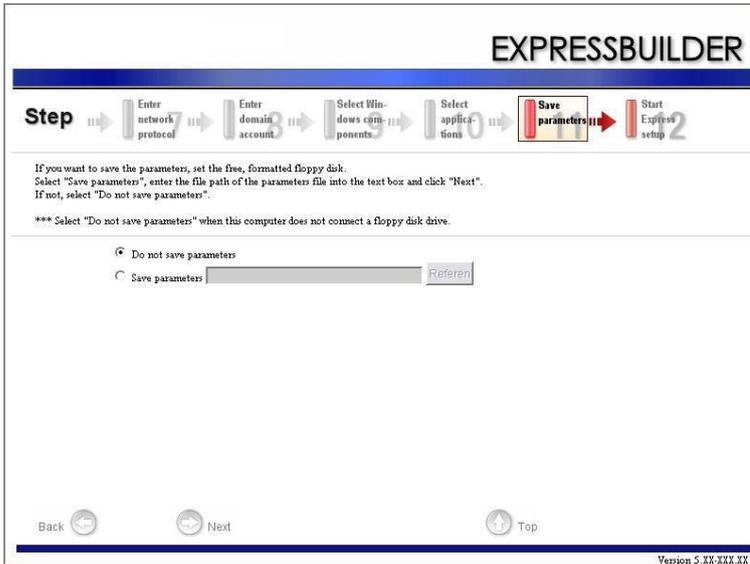
13. Select the installing applications.

The [Setting applications] step is displayed. Confirm the parameters, modify if necessary, and click [Next].



14. Save the parameters.

The [Save parameters] step is displayed.

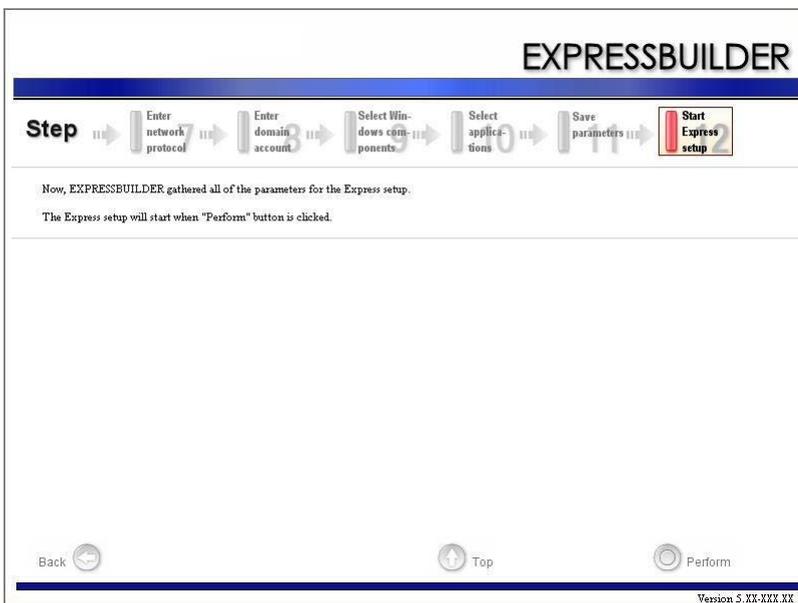


If you want to save the parameters , set the free formatted floppy disk.

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

Otherwise, select [Do not save parameters].

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



16. Copy the optional Mass Storage Driver module.

If you install an optional Mass Storage Driver, the message will be shown.

Insert the CD-ROM or floppy disk attached to the Mass Storage Driver and follow the on-screen messages.

- 17.** Remove the EXPRESSBUILDER DVD from the CD-RW/DVD-ROM drive when prompted to do so.

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

Insert the Windows Server 2003 CD-ROM into the CD-RW/DVD-ROM drive.

The [Agree Software License Agreement] screen appears.

- 18.** Read the contents carefully and click [Yes] if you 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.
- 

- 19.** If you selected [Install the Service Pack] at the [Specify Medium Partition] step, follow the procedure below.

- 1) Follow the message to take Windows Server 2003 CD-ROM out of the CD-RW/DVD-ROM drive.
- 2) Follow the message to insert Windows Server 2003 Service Pack 2 into the CD-RW/DVD-ROM drive.

---

**IMPORTANT:** If you are installing the Windows CD-ROM that contains Service Pack 2 to your system, you do not have to apply the Service pack 2 again.

---

Windows Server 2003 and the specified application will be installed automatically. Install and configure the device drivers.

- 20.** If you install Microsoft Windows Server 2003 R2, insert the Microsoft Windows Server 2003 R2 Standard Edition DISC 2 or the Microsoft Windows Server 2003 R2 Enterprise Edition DISC 2 into the CD-RW/DVD-ROM drive after the OS installation.

Follow the on-screen messages to complete the installation.

When the installation is finished, remove the optical disc from the CD-RW/DVD-ROM drive, and restart the system.

---

## Installing and Setting the Device Drivers

Follow these steps to install and configure the device drivers.

### PROSet

Using PROSet enables the following items:

- Detailed information of the adapter confirmation.
- Loop back test, packet transmission test diagnosis and so on.
- Teaming setup.

Configuring several network adapters as one team provides the server with a tolerant environment and enhances throughput between the switches.

PROSet is necessary to use these features.

Follow the procedure below to install PROSet.

1. Insert the EXPRESSBUILDER DVD into the CD-RW/DVD-ROM drive.
2. The [Windows Explorer] dialog starts.
  - \* Procedure using a standard start menu  
Click Start menu and click [Windows Explorer].
  - \* Procedure using a classic start menu  
Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "dxsetup.exe" in the following directory.  
\\001\win\winnt\dotnet\dl3\proset\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. Select [I accept the terms in the license agreement] and click [Next].
8. Click [Install].
9. When [InstallShield Wizard Completed] window is displayed, click [Finished].
10. Restart the system.

---

**NOTE:** If you make no changes to the parameters, click the [Cancel] button to close the dialog. Clicking the [OK] button will cause a temporary loss of network connectivity.

---

## Network Driver

Specify the details of the network driver.

Two standard network drivers will be installed automatically, but the link speed and duplex mode must be manually specified.

[When PROSet is not installed]

1. The [Local Area Connection Properties] dialog box appears.
  - \* Procedure using a standard start menu
    1. Click Start menu, click [Control Panel], click [Network Connections], and click [Local Area Connection].
  - \* Procedure using a classic start menu
    1. Click the Start menu, click [Settings] and click [Network Connections].  
The [Network Connections] dialog box appears.
    2. Right-click [Local Area Connection] and click [Properties] from the pop-up menu.
2. Click [Configure].  
The properties dialog box for the network adapter appears.
3. Click [Advanced] and specify a [Link Speed & Duplex] identical to the value specified for the HUB.
4. Click [OK] on the properties dialog box for network adapter.

[When PROSet is installed]

1. The [Intel PROSet] dialog box appears.
  - \* Procedure using a standard start menu  
Click the Start menu, point to [Control Panel] and click [Intel PROSet].
  - \* Procedure using the classic start menu
    1. Click Start menu, point to [Settings] and click [Control Panel].
    2. Double-click [Intel(R) PROSet] on the [Control Panel] window.
2. Click on [(Network Adapter Name)] in the list.
3. Click on [Speed] and specify a [Link Speed & Duplex Settings] value identical to the value specified for the HUB.
4. Click [Apply] and click [OK].

Specify the other network driver using the same procedure.

If necessary, add or delete any protocols and services.

This procedure can also be applied on the properties dialog box for the local area network which appears from the [Network and Dial-up Connection].

---

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

---

## Optional Network Board Driver (1000BASE-T (2CH)/1000BASE-T (4ch)/1000BASE-T/10GbE)

If you want to use the optional Network Board (1000BASE-T (2CH)/1000BASE-T (4ch)), install the driver stored in the EXPRESSBUILDER DVD.

When using (1000BASE-T (2CH)/1000BASE-T (4ch)/1000BASE-T)

\001\win\winnt\dotnet\dl3\pro1000\win32

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

When using (10GbE)

Please refer to the installation manual provided with the board.

### Installation of the Optional Network Board Driver

1. Start the Device Manager.
2. Click [Network adapters] and double-click [(Network Adapter Name)].  
The [(Network Adapter Name) Properties] appears.

---

**NOTE:** [(Intel(R) PRO/1000...)] is the name of On-Board adapter. All the other names show the Optional Network Board.

---

3. Click the [Driver] tab and click [Update Driver...].  
The [Hardware Update Wizard] appears.
4. Select the [Install from a list or specific location(Advanced)] radio button and click [Next].
5. Select the [Search for the best driver in these locations] radio button and check off the [Search removable media (floppy, CD-ROM...)] check box.
6. Check the [Include this location in the search] check box and when using [1000BASE-T (2CH)/1000BASE-T (4ch)/1000BASE-T], specify [\001\win\winnt\dotnet\dl3\pro1000\win32].  
Click [Next].
7. Click [Finish].

## Adapter Fault Tolerance (AFT)/Adaptive Load Balancing (ALB)

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.

---

### IMPORTANT:

- AFT/ALB setup must be operated after installing the drivers 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 separate switches, they will not work normally.
  - The adapters specified as a group of Adaptive Load Balancing (ALB) can be connected only to the Switching Hub.
  - When replacing the motherboard or optional network card, make sure to remove the adapter teaming before the exchange and recreate the adapter team once the exchange is completed.
- 

If you want to use the AFT/ALB feature, follow the procedure below to setup.

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

\* Procedure using the standard start menu

Click the Start menu, point to [Control Panel], [Administrative tools], and click [Computer Management] and then double click the [(Network Adapter Name)] in the Network Adapter list.

\* Procedure using the classic start menu

1. Click the Start menu, point to [Settings] and click [Control Panel].
2. Click [Administrative Tools].
3. Click [Computer Management] and double click the [(Network Adapter Name)] in the Network Adapter list.

2. Select the [Teaming] tab and then check [Team with other adapters] and click [New Team...].

The [New Team Wizard] dialog box appears. Click [Next].

\*Specify a name for the team if necessary.

3. Select the adapters to include in the team.

## Installing the Disk Array Controller Driver (LSILOGIC MEGARAID SAS 8480E)

The Disk Array controller driver will be installed automatically.

## Installing the SAS Controller Driver (LSISAS3443E-R)

If you use the SAS controller driver (LSISAS3443E-R), update your system with the EXPRESSBUILDER DVD attached to your system.

The SAS controller driver will be installed automatically.

## Graphics Accelerator Driver

The standard graphics accelerator drivers that are mounted will be installed automatically. Follow the procedure below if it is necessary to install manually.

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

1. Insert the EXPRESSBUILDER DVD into the CD-RW/DVD-ROM drive.
2. Click the Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "setup.exe" in the following directory.  
    \001\win\winnt\dotnet\video\setup.exe.
4. Follow the on-screen message to proceed with the installation.  
    If the dialog message "Digital Signature could not be found." appears, select [Yes] to continue.
5. Remove the EXPRESSBUILDER DVD from the CD-RW/DVD-ROM drive, follow the on-screen instructions and restart the system.

## Available switch options for the Windows Server 2003 Boot.ini file.

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

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

- Microsoft Knowledge Base - Article ID: 833721

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

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

However, the Microsoft operating system products which support /PAE switch option are limited.

Refer to the following article in Microsoft Knowledge Base to check the supported products.

- Microsoft Knowledge Base - Article ID: 291988

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

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

1. Click [Start], point to [Settings], and then click [Control Panel].
2. In [Control Panel], double-click [System].
3. Click the [Advanced] tab, and then click [Settings] under [Setup and Recovery].
4. Under [System Setup], click [Edit] to open [Boot.ini].
5. Add "/PAE" to the [Operating Systems] section in the [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
```

---

**NOTE:** If you choose one of the items in the "Default operating system" drop-down list box in the [Setup and Recovery] group box, you can make your system start automatically from the switch you specified.

---

---

## Solving Problems Settings

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

### Memory Dump (Debug Information)

This section describes the procedure used to collect the memory dump (debug information) in the server.

---

**IMPORTANT:** Cautions for the Memory Dump

- The maintenance service representative is in charge of collecting memory dump. You only need to specify the memory dump.
  - If any trouble occurs after specifying the process below, a message informing that the system has a virtual memory shortage may appear, but continue to start the system. If you restart the system in such case, the memory dump may not be stored correctly.
- 

Follow the procedure below to specify the memory dump.

1. Select [Control Panel] and click [System].  
The [System Properties] dialog box appears.
2. Select the [Advanced] tab.
3. Click [Settings] on the [Startup and Recovery] group box.

---

**IMPORTANT:**

Windows Server 2003 x64 Editions

- We recommend you specify "Complete Memory Dump" to write the debug information.  
If the mounted memory size is larger than 2GB, "Complete Memory Dump" cannot be specified so specify "Kernel Memory Dump" instead.
- Specify a drive where there is a free area larger 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 the debugging information (memory dump) changes when adding memory. Check the size of the empty space in the debugging information (memory dump) write destination drive.

Windows Server 2003

- We recommend you specify "Complete Memory Dump" to write the debug information.  
If the mounted memory size is larger than 2GB, "Complete Memory Dump" cannot be specified so specify "Kernel Memory Dump" instead.
  - Specify a drive where there is a free area larger than the size of "the memory capacity mounted on Express server + 12MB" (In case the memory capacity is larger 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) changes when adding memory. Check 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. To 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 the [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 a value larger than [Recommended], and click [Set].

---

**IMPORTANT:**

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). A paging file with an initial size large enough to store the dump file in the boot drive is required.  
Correct debug information might not be collected due to a virtual memory shortage when the paging file is insufficient, so set a paging file size large enough for the entire system.
  - For more information on the "Recommended" value, see "About the System Partition Size" described earlier.
  - If the memory is expanded, re-specify the paging file to suit the new memory size.
- 

9. Click [OK].

A message prompting to restart the system may appear according to the modified specification. In such a case, restart the system.

## Windows Dr. Watson

Windows Dr. Watson is a debugger for application errors. If any application error is detected, Dr. Watson diagnoses the server and logs the diagnostic information (log). Follow the procedure below to instruct 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 in which 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 a network path. Specify a path on a local computer.

---

4. Specify the location of the crash dump file in the [Crash Dump] box.

---

**NOTE:** "Crash Dump File" is a binary file that can be read with Windows Debugger.

---

5. Check the following check boxes on the [Option] box.
  - Dump Symbol Table
  - Dump All Thread Contexts
  - Add To Existing Log File

Create Crash Dump File

For more information on each of the above functions, refer to Online Help.

6. Click [OK].

## Network Monitor

Using Network Monitor helps you investigate and manage the network troubles. To use Network Monitor, you need to restart the system after the installation has completed, so we recommend you install Network Monitor as soon as possible, before any network troubles can occur.

1. Point to [Settings] from the 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 CD-RW/DVD-ROM 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 [NetworkMonitor]. For information on how to operate Network Monitor, refer to Online Help.

---

## Installing Maintenance Utilities

Various maintenance utilities are included in your EXPRESSBUILDER DVD. See Chapter 6 for more information on installing the utilities to your server or management workstations.

---

## Updating the System - Applying Service Pack -

---

**IMPORTANT:** If you install the Windows Server 2003 CD-ROM including the Service Pack 2 to your system, you do not have to apply the Service Pack 2 again.

---

"Updating the System" is automatically executed by Express Setup.

Execute "Updating the System" in following cases.

- Processor is expanded (expanded from single processor to multi-processor).
- Modified system configuration.
- Recovered the system using recovery process.

See the "Updating the System - Applying Service Pack -" section in Appendix D for details on the 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 as described in the following procedure:

1. Insert the EXPRESSBUILDER DVD into the CD-RW/DVD-ROM drive and reboot the system.
2. Select [Maintenance Tools (Normal mode)].
3. Select [English].
4. Select [Maintenance Utility].
5. Select [System Information Management].
6. Insert a floppy disk into the floppy disk drive.
7. Select [Save].

---

## Installing with the OEM-FD for Mass Storage Device

This section explains how to setup with the OEM-FD. This is not a standard procedure. The detailed information is provided by the manual of the Mass Storage Device.

### Installation of a Mass storage device not supported by Express Setup

If you would like to install or re-install the OS when the system has a new mass storage device not supported by the 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 a RAID Controller, configure the RAID system before running the EXPRESSBUILDER.
3. Boot the system from the EXPRESSBUILDER DVD.
4. (a) When the "Use Existing Array" dialog box appears, check "Skip Creating a Virtual disk".  
(b) Check "Apply OEM-FD for Mass storage device".
5. Copy the driver for the mass storage device in the Express Setup.

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

Follow the on-screen messages to continue the Express Setup.

# Chapter 6

---

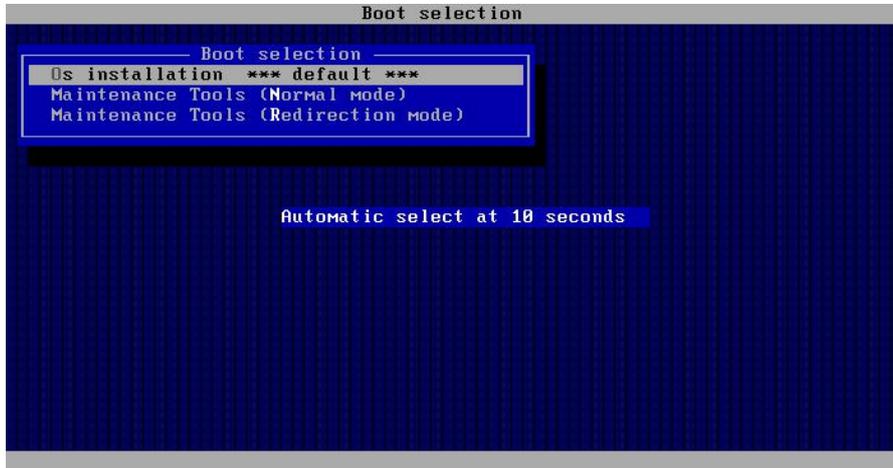
## Installing and Using Utilities

This section describes how to use the EXPRESSBUILDER DVD that comes with your server and to install the utilities stored on the EXPRESSBUILDER.

# EXPRESSBUILDER

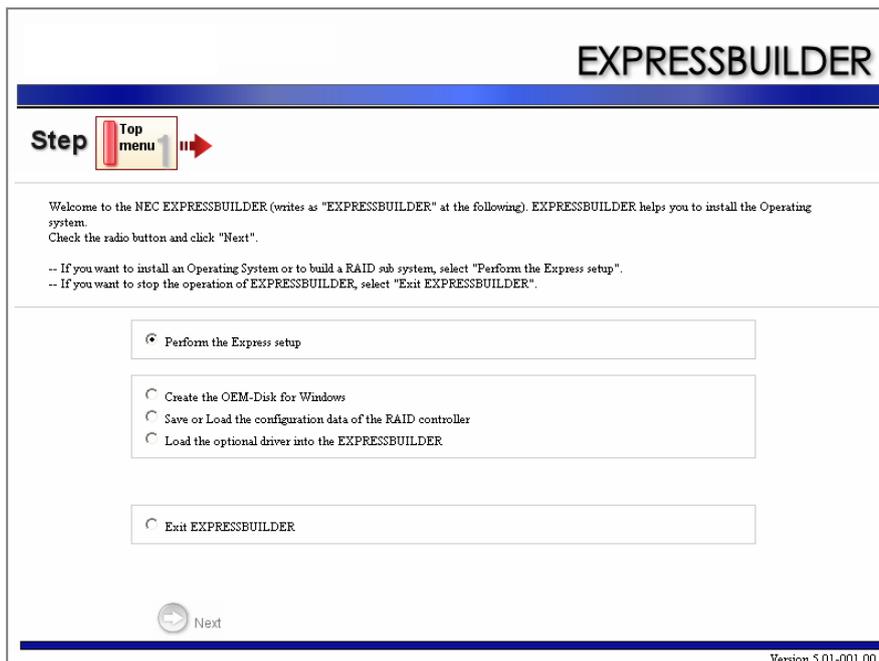
The EXPRESSBUILDER (referred to as "EXPRESSBUILDER" hereinafter) helps you install the Operating system/the Management software or use the maintenance utilities.

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



## ■ OS installation

If you select this item, the Top menu appears.



## IMPORTANT:

- This tool is a Configuration Tool built on Windows PE 2.0 technology. An automatic reboot occurs after 72 hours from the start.
- The configuration with Windows PE 2.0 supports Windows Server 2003 (32bit) and Windows Vista Business (32-bit (x86)), no other operating system is supported.

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. You may have to use it if you add a new device to the server. (See Chapter 5.)

- Maintenance Tools (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 7.)

- BIOS/FW Updating

You can update the system BIOS using a floppy disk (prepare a 3.5" floppy disk).

- ROM-DOS Startup FD

The ROM-DOS Startup FD is used to start the ROM-DOS system.

- Test and diagnostics

This function allows you to diagnose this computer. (See Chapter 7.)

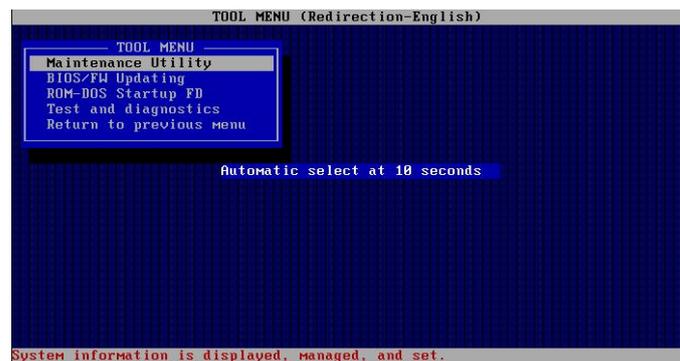
- Maintenance Tools (Redirection Mode)

If you want to operate this computer via the BIOS redirection (the console-less function), select this item.

---

**NOTE:** If you operate this computer via the Remote KVM function, select the "Maintenance Tools (Normal mode)".

---

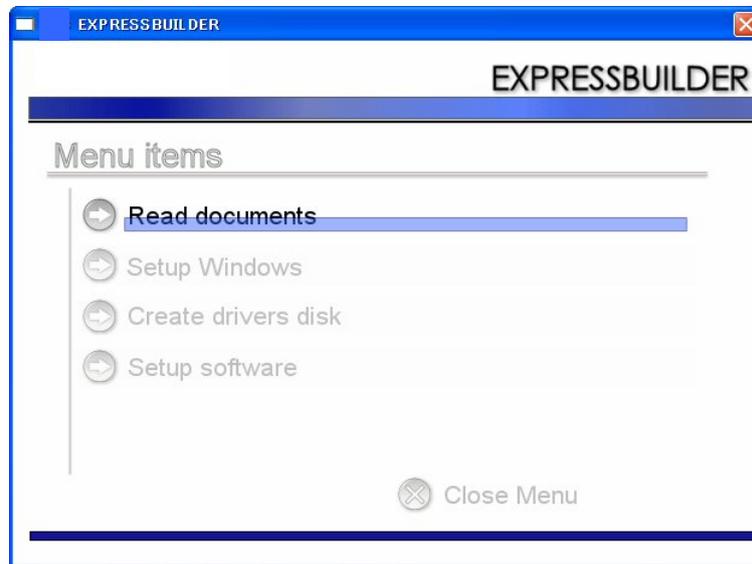


The menu's functions are the same as the "Maintenance Tools (Normal Mode)".

---

## Autorun Menu

When the EXPRESSBUILDER disk is inserted into the DVD drive, Windows automatically launches the menu 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 DVD drive that contains the EXPRESSBUILDER DVD.

Some menu items are grayed-out when the logon user does not have administrator authority or if 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 the [Parameters file] that is used for configuring the server with the Express Setup (see Chapter 5 for details).

If you use the Parameters file created by the Express Setup and the Parameter File Creator to operate the setup, the setup can be done automatically except for a few key inputs to confirm the specification. You can also install the system with the same specifications as before when re-installing the system. We recommend you create a [Parameters file] to setup the servers from the EXPRESSBUILDER.

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

---

**IMPORTANT:** You cannot create a [Parameters file] for Microsoft Windows Server 2003 x64 Editions.

---

---

**NOTE:** You can install Windows Server 2003 without a [Parameters file]. Also, you can modify/newly create the [Parameters file] during the setup with the EXPRESSBUILDER.

---

---

## Parameters File

This section describes how to specify the setup information that is necessary for the OS installation and creation using a Parameters File.

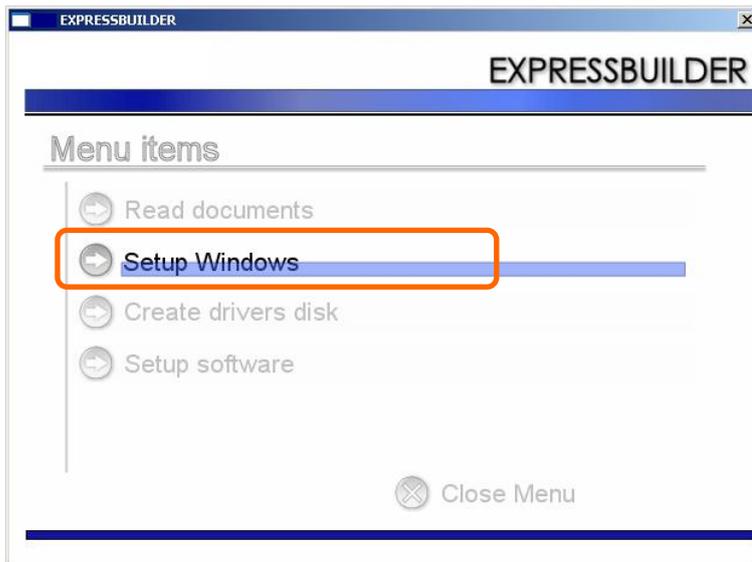
Follow the procedure below.

---

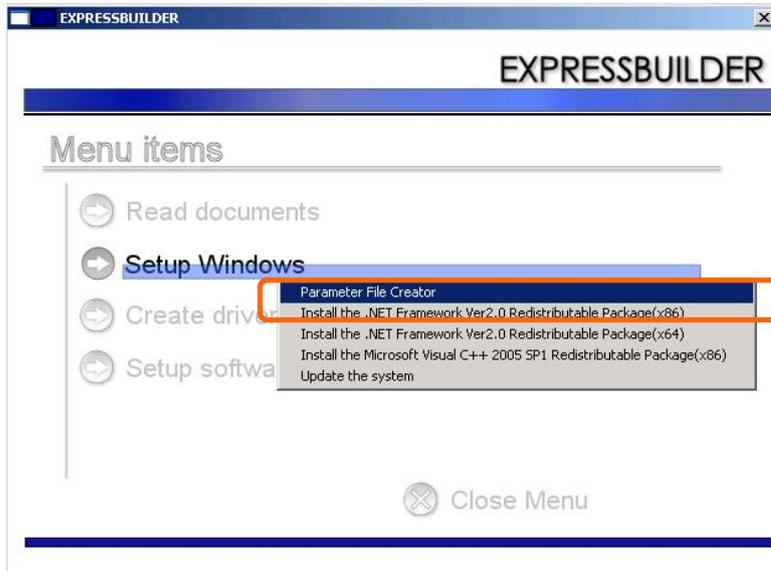
**IMPORTANT:** Do not remove the EXPRESSBUILDER DVD from the drive during the parameters file creation.

---

1. Start the OS.
2. Insert the EXPRESSBUILDER DVD into the CD-RW/DVD-ROM drive.  
The menu appears.
3. Right-click on the screen or left-click [Setup Windows]. The menu displayed below appears.



4. Click [Parameter File Creator].

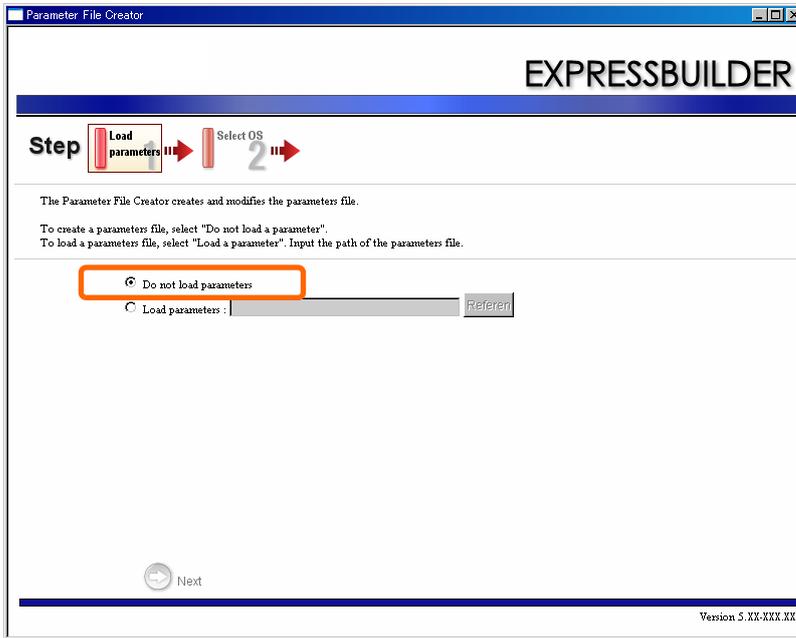


The Parameter File Creator is displayed.



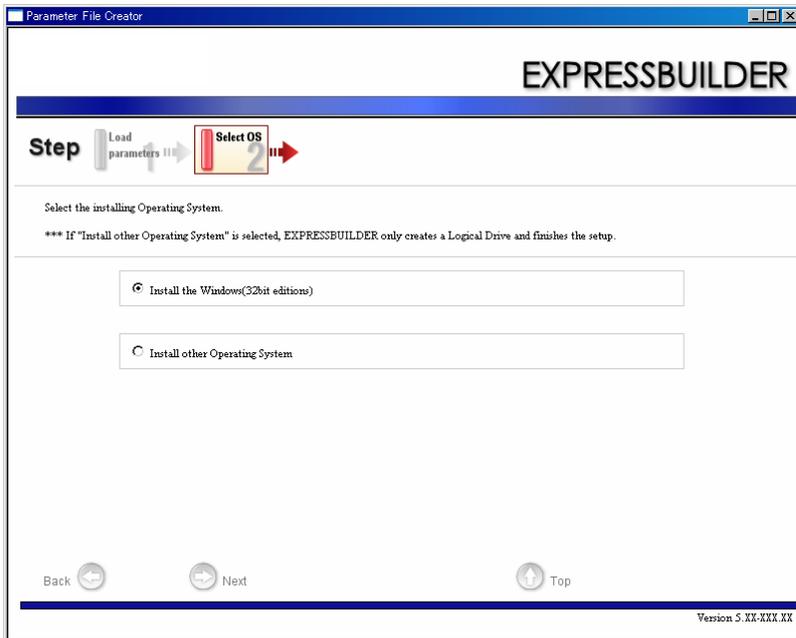
5. [Load Parameters] step is displayed.

Select [Do not load parameters] from the menu, and click [Next].



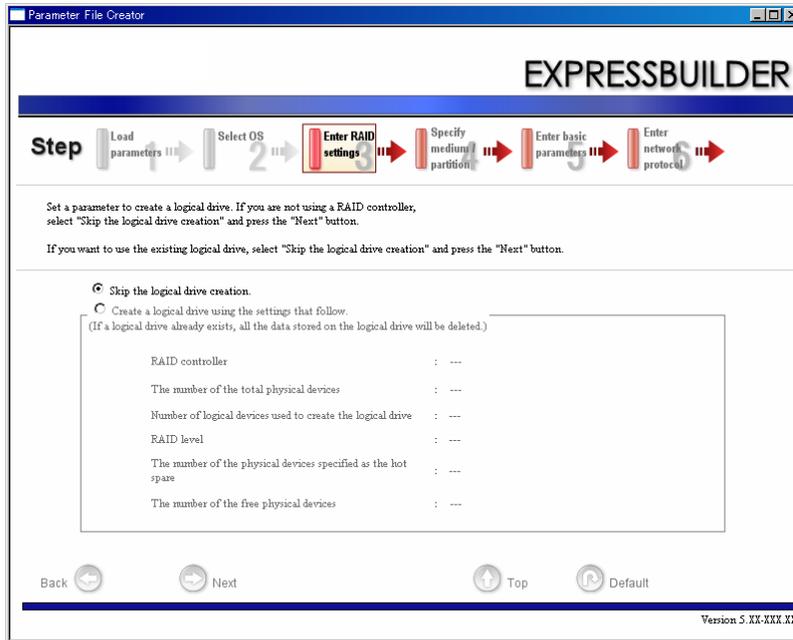
6. Select the Operating System to install.

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



7. Enter the virtual disk settings.

The [Enter RAID setting] step is displayed. Confirm the parameters, modify if necessary, and click [Next].



---

**IMPORTANT:** At "The number of the total physical devices", the Parameter File Creator displays the 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 are connected to the target system.

---

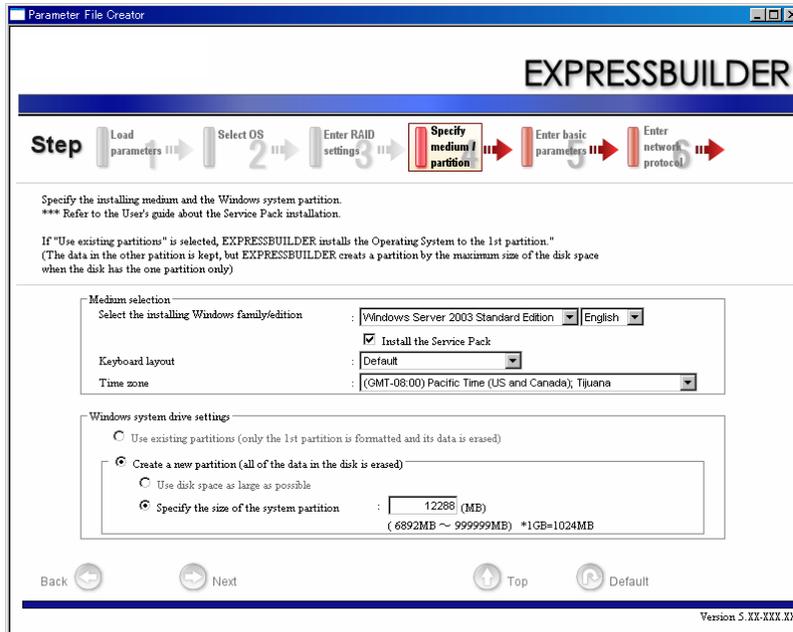
---

**NOTE:** You can use only physical devices that have the same model number to configure a logical drive.

---

8. Specify the installation medium and the Windows system partition.

The [Specify medium / Partitions] step is displayed. Confirm the parameters, modify if necessary, and click [Next].



**IMPORTANT:**

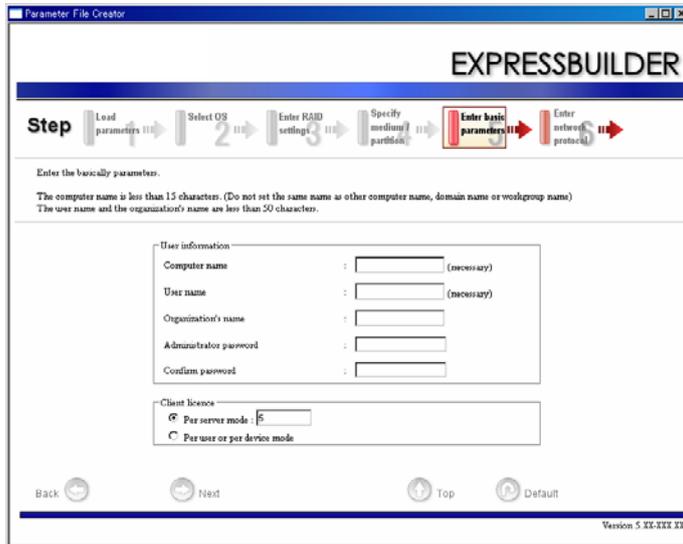
- About the partition size
  - Specify a partition size larger than the required minimum size for the OS installation.
  - Do not specify a larger partition size than the capacity of the connected hard disk drive.
- If you select "Create a new partition" at "Windows system drive settings", the contents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

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

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

9. Enter the user information, time zone and client license mode.

The [Enter basic parameters] step is displayed. Confirm the parameters, modify if necessary, and click [Next].



---

**IMPORTANT:** The Computer name and User name are required parameters.

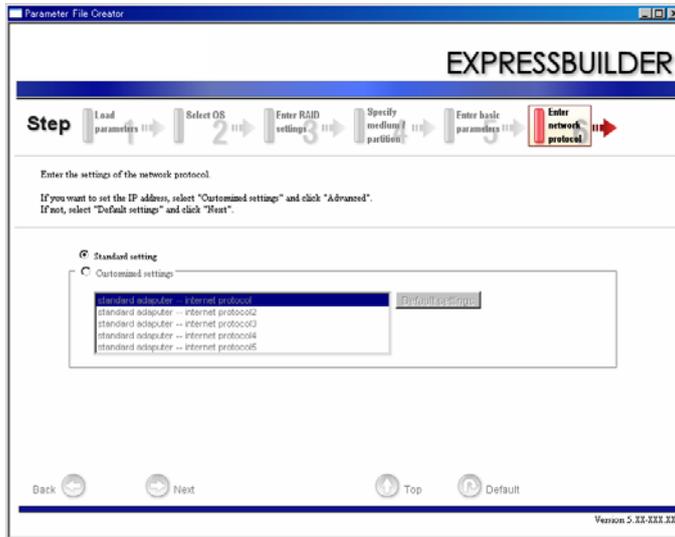
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**NOTE:** Even if you set no value into "Administrator password", "Confirm password", "●●●●●●" is displayed.

---

10. Enter the network protocol settings.

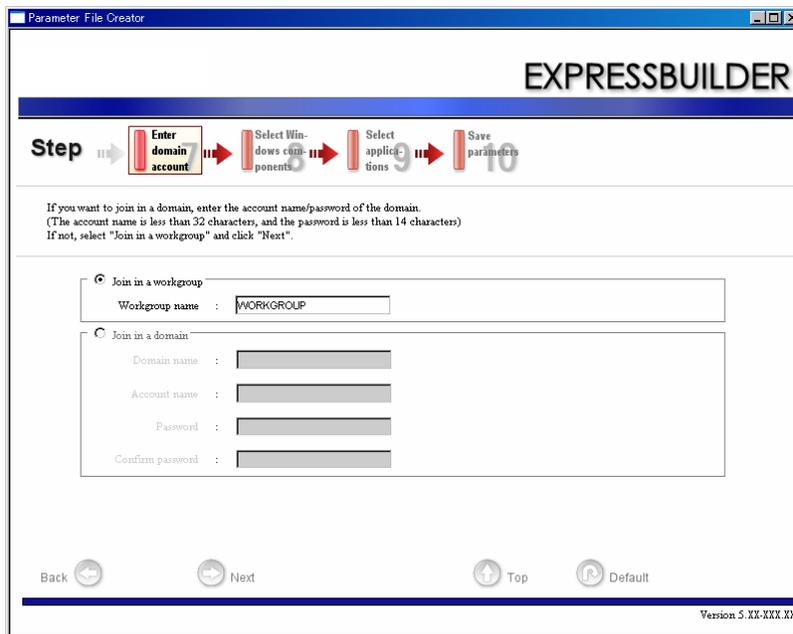
The [Enter network protocol] step is displayed. Confirm the parameters, modify if necessary, and click [Next].



**NOTE:** The entry order in the custom settings may differ from the LAN port numbering.

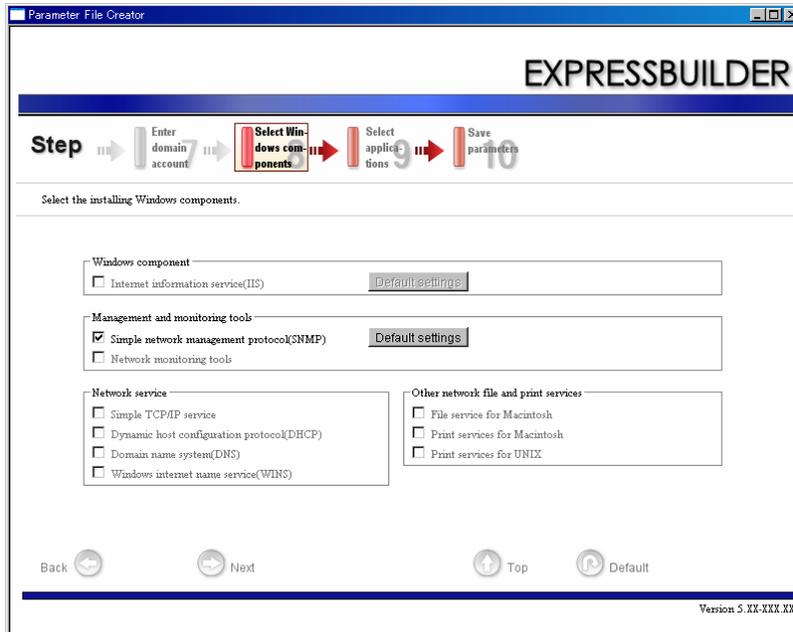
11. Enter the domain or workgroup name to be used.

The [Enter domain and account] step is displayed. Confirm the parameters, modify if necessary, and click [Next].



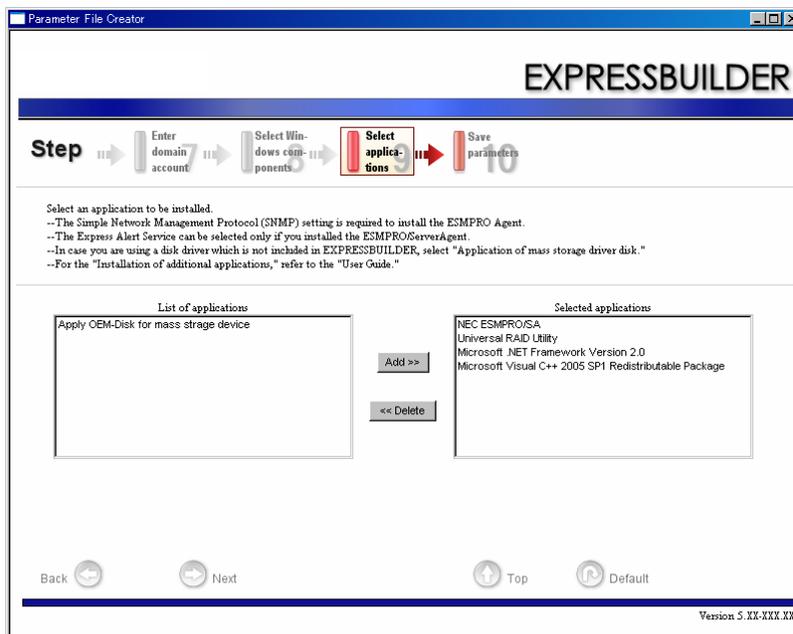
12. Select the components to install.

The [Select Windows component] step is displayed. Confirm the parameters, modify if necessary, and click [Next]



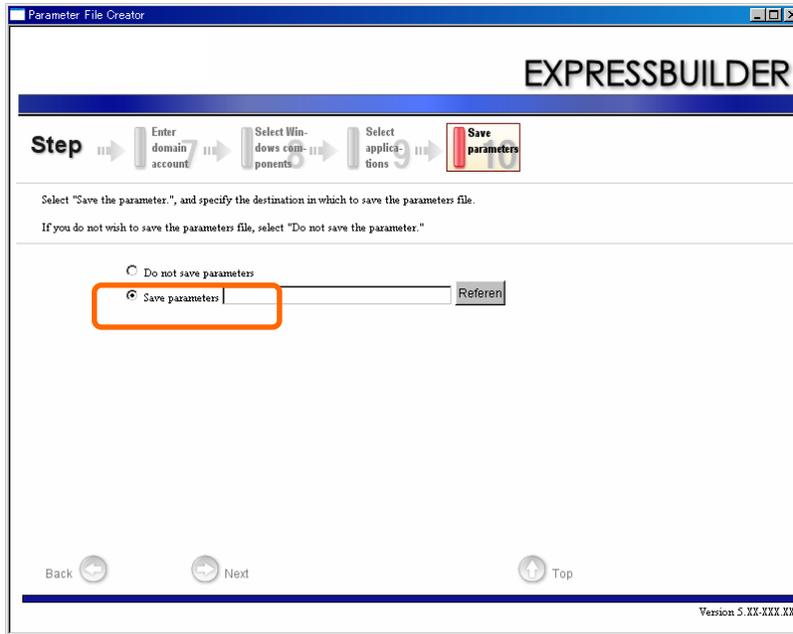
13. Select the applications to install.

The [Setting applications] step is displayed. Confirm the parameters, modify if necessary, and click [Next].



14. Save the parameters.

The [Save parameters] step is displayed.

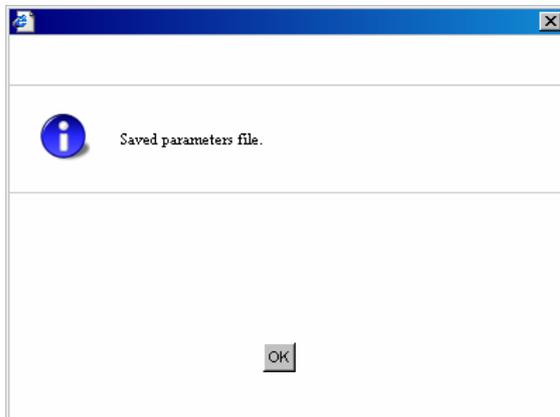


If you want to save the parameters, set the free formatted floppy disk.

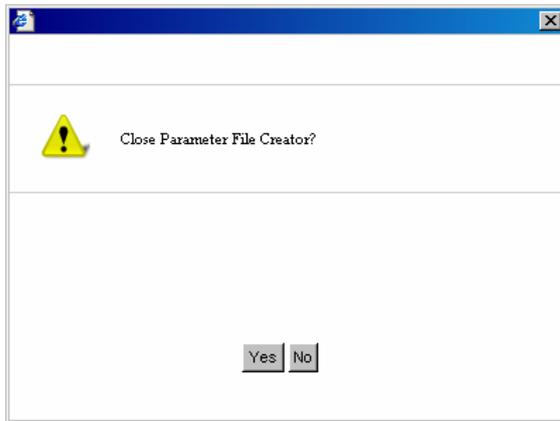
Select [Save parameters], enter the file path of the parameters files into the text box and click [Next].

Otherwise, select [Do not save parameters].

15. Saved to a floppy disk.



The floppy disk containing the parameters file has been created.



Click [Yes] to exit the Parameter File Creator.

---

**NOTES:**

- If you wish to modify the existing information file (parameters file), click "Load Parameters" at the [Load Parameters] screen. Refer to the help to modify the information file.
  - If you wish to abort the operation , click  at the upper-right corner of the screen.
-

## NEC ESMPRO

The NEC ESMPRO (referred to as ESMPRO hereafter) lets a system administrator manage remote servers across a network. ESMPRO monitors the server hardware and software configurations, failures, and performance. With log data collected by ESMPRO, a system administrator can track long-term and short-term performance, monitor server usage, create graphs to record trends, and check the 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 ESMPRO offers many functions and features to manage the remote servers across a network. These features help the system administrator perform daily system operation, system extension, and transfer tasks. Some features of the ESMPRO Manager include:

- Hardware and software server configuration
  - Hardware resources mounted in the servers, such as the processor, 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 actions.
  - Failure data includes hardware failure information such as system board temperature, memory failure, crashes, and software failure information.
- Performance
  - ESMPRO monitors the server performance and the server usage and displays information, such as the rate of processor 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 documentation on the EXPRESSBUILDER DVD.**

### Additional Information

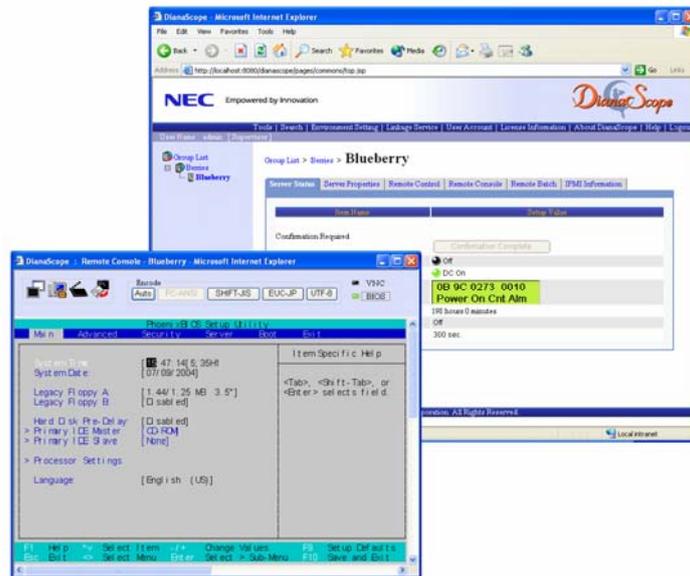
- Indication on the NEC ESMPRO DataViewer after Hot-Add/Remove Memory

If you add or remove a memory board dynamically by using the hot-add/remove feature, the added or removed memory size will not be indicated correctly on the DataViewer of NEC ESMPRO Manager. Reboot the system.

## NEC DianaScope

NEC DianaScope is a software application that can be used for the remote management of the server.

Refer to the online documentation for more information on the features and the installation of NEC DianaScope.



---

### NOTES:

- One server license is required for each server managed remotely using NEC DianaScope.
  - The following server license is included in this server product.
    - UL1198-001E DianaScope Additional Server License (1)
-

## **Universal RAID Utility**

The Universal RAID Utility is an application used to manage or monitor the LSI Logic MegaRAID SAS 8480E Disk Array Controller. You can use the Universal RAID Utility for the management of the RAID System and error notification by event monitoring while the system is running.

Before attempting to operate the Universal RAID Utility, read the "Universal RAID Utility User's Guide" included in the EXPRESSBUILDER DVD. The manual explains the Universal RAID Utility installation procedure and provides notes on the Universal RAID Utility operation.

---

### **Setup with Express Setup**

You can install the Universal RAID Utility using the Express Setup contained in the EXPRESSBUILDER DVD. When you start the Express Setup, a dialog box prompting to specify an application appears. Select [Universal RAID Utility].

---

### **Manual Setup**

See the online document "Universal RAID Utility User's Guide" contained in the EXPRESSBUILDER DVD for more information.

---

### **Using the Universal RAID Utility via the Network**

The Universal RAID Utility cannot manage via the network a computer on which a RAID Controller is installed. Use the remote console function to do so. (ex. Remote Desktop of Windows).

# Chapter 7

---

## Maintenance

This chapter describes the daily maintenance of the server and the precautions to follow when relocating or storing the server.

### MAKING BACKUP COPIES

We recommend you make backup copies of your valuable data stored in the hard disk drives of the server on a regular basis. For information on the backup storage devices suitable for the server and the 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 a RAID System configuration. When your hard disk drives have been auto-rebuilt due to a failure, we recommend 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 it in good shape.

<b>⚠ WARNING</b>	
	<p>Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injuries. See pages 1-3 to 1-8 for details.</p> <p>Do not disassemble, repair, or alter the server. Do not look into the Optical Disc Drive. Do not remove the lithium battery. Disconnect the power plug before cleaning the server.</p>

<b>⚠ CAUTION</b>	
	<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 1-3 to 1-8 for details.</p> <p>High temperature Make sure to complete the board installation.</p>

---

### 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 powered off (the POWER/SLEEP LED is unlit).
2. Unplug the power cord of the server from a power outlet.
3. Wipe off the dust from the power cord plug with a dry cloth.
4. Soak a soft cloth in a 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, and wipe the server with it once again.
7. Wipe the server with a dry cloth.
8. Wipe off dust from the fan exhaust opening on the rear of the server with a dry cloth.

---

## Cleaning the Inside

One of the most important items of a good maintenance program is a regular and thorough cleaning of the inside of the server, especially around the base 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 the server components. The dust may also contain conductive or corrosive materials that can cause short circuits or corrosion of the electrical contacts.

The frequency at which you should clean the inside of the server depends on the environment in which it is located. For most office environments, every 12 months is probably sufficient. For more severe environments, clean the inside every 6 months.

Cleaning the interior of the server implies powering off the server and removing the left side cover. You will need a small vacuum cleaner (with a plastic tipped nozzle and electrostatic protection), computer grade canned air, and a small brush.

Follow the procedure below to clean the inside of the server.

 <b>WARNING</b>	
 	<p>Unplug all power cords.</p> <p>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.</p>

1. Turn off the server and unplug all the power cords.
2. Remove the top cover. (See Chapter 9.)
3. Use a small brush to loosen any dust and debris on the base board.
4. Use computer grade canned air to blow dust off components on the base board.
5. Use a small vacuum cleaner with a plastic tip to vacuum out the dust and debris from the inside of the server.
6. Reinstall the top cover. (See Chapter 9.)
7. Reconnect all the power cords and power on the server.

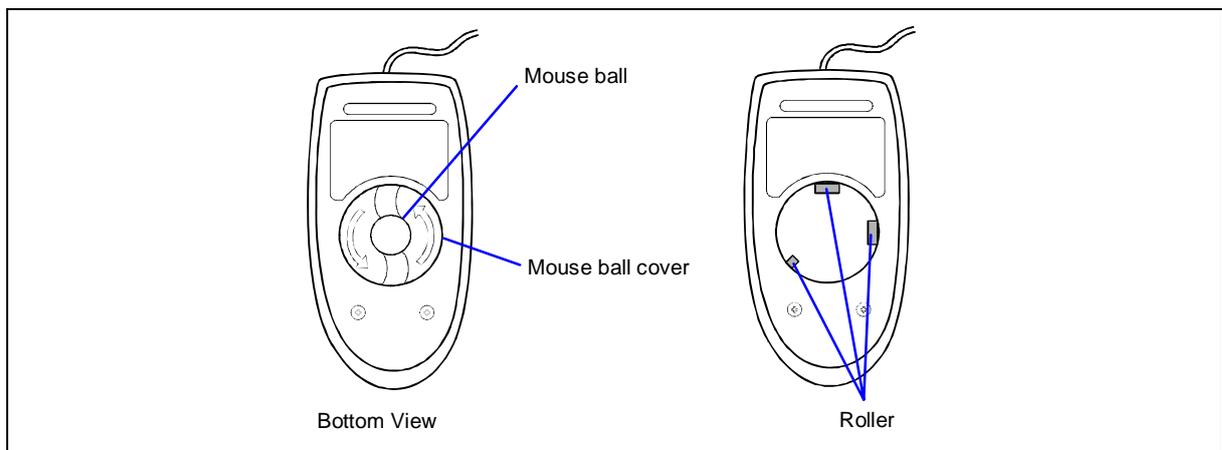
---

## Cleaning the Keyboard/Mouse

Make sure that the server and peripheral devices are powered off (the POWER/SLEEP LED is unlit), 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 regularly to clean the mouse:

1. Prepare cold or lukewarm water, neutral detergent, alcohol, two dry soft clothes, and cotton swabs.
2. Make sure that the server is powered off (the POWER/SLEEP LED is unlit).
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 a 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 the three small rollers inside the mouse with a cotton swab soaked with alcohol. Wipe the stains slowly and carefully by rotating the 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 locks into place.

---

## Cleaning the Optical Disc Drive

A dusty Optical Disc Drive or dust-accumulated in a tray causes the device to fail to read the data correctly.

Follow the procedure below regularly to clean the tray and Optical Disc Drive:

1. Make sure that the server is powered on (the POWER/SLEEP LED is lit).
2. Press the Eject button on the front of the Optical Disc Drive.  
The tray comes out.
3. Hold the Optical Disc lightly and take it out from the tray.

---

**NOTE:** Do not touch the signal side of the Optical Disc with your fingers.

---

4. Wipe the tray with a dry soft cloth.

---

**IMPORTANT:** Do not wipe the lens of the Optical Disc Drive. Doing so may damage the lens and may cause a malfunction of the drive.

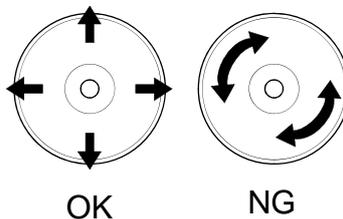
---

5. Press the Eject button or gently push the front of the tray front to close it.
6. Wipe the signal side of the Optical Disc with a dry soft cloth.

---

**IMPORTANT:** Wipe Optical Discs from the center to the outside. Use only a specific Optical Disc cleaner if necessary. Cleaning an Optical Disc with record spray/cleaner, benzene, or thinner causes damage to the Optical Disc contents. At worst, inserting the Optical Disc into the server may cause a failure.

---



# MAINTENANCE TOOLS

The Maintenance Tools is a prevention tool that allows to maintain, and to analyze the trouble.

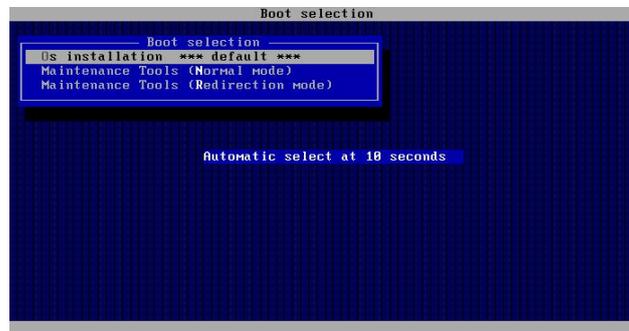
---

## Starting Maintenance Tools

Start the Maintenance Tool according to the following procedure.

1. Turn on first the peripheral devices and then the server.
2. Insert the EXPRESSBUILDER DVD supplied with your server into the Optical Disc Drive.
3. Press **Ctrl, Alt,** and **Delete** to reboot the server from the EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)

The system boots up displaying the Boot Selection menu.

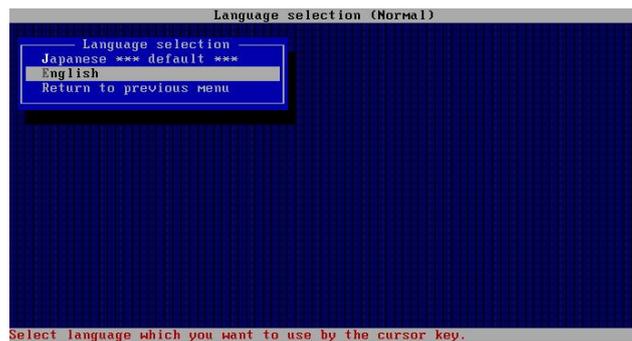


---

**IMPORTANT:** The initial selection of the menu is "Os installation". "Os installation" starts automatically after the Boot Selection menu has been displayed.

---

4. When a local console is used, the "Maintenance Tools (Normal mode)" is selected. Moreover, "Maintenance Tools (Redirection mode)" is selected when using it with remote console.



---

**IMPORTANT:** The initial selection of the menu is "Japanese". "Japanese" starts automatically when no other choice is made in the five seconds following the display of the Language Selection menu.

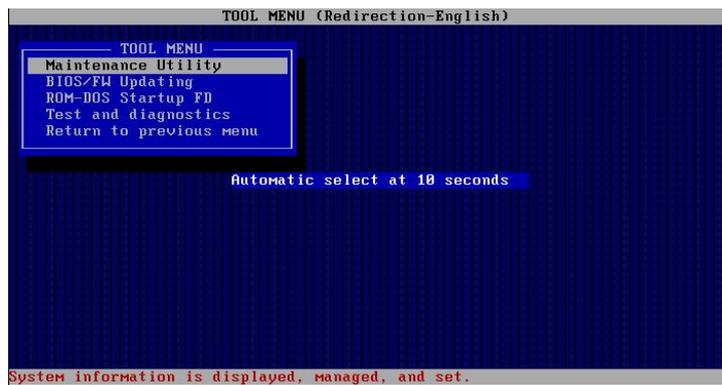
---

- "English" is selected.

The tool menu is displayed.



### ***Using a local console***



### ***Using a remote console***

- Each tool is selected, and 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 the 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 to be used by your service representative. The EXPRESSBUILDER DVD you have created contains a file that describes the operation of the utility, but do not attempt to use the utility by yourself. Contact your service representative and follow their instructions.
  - See the online 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

Allows 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

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

- System Information Viewer

Allows to view information on the processor and the BIOS and to export it to a text file.

- System Information Management

Allows 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 by the customer service representative.

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

---

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

---

- ROM-DOS startup FD

Creates a support disk allowing to start 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 the additional board is normal.

After the Test and diagnostics has been executed, a system check program assigned to each model starts. See "System Diagnostics" for details.

---

## Maintenance Tools with Remote Console

This subsection describes the procedures for using the Maintenance Tools with a remote console.

The Maintenance Tools contains a 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 COM2 (serial) port.

---

### **IMPORTANT:**

- Do not use this feature on any other computer than the server, or on any other server obtained without the EXPRESSBUILDER. Doing so may cause a failure of the server.
  - Select "Maintenance Tools (Redirection mode)" for the remote console in the "Boot Selection" menu. Even if the rest is selected, it is not displayed in the management PC.
- 

### 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 (COM2)

For the procedure to start the Maintenance Tools with the Remote Console, see "NEC DianaScope".

---

**IMPORTANT:** Do not change the boot device order in the BOOT menu in the BIOS SETUP. The EXPRESSBUILDER cannot be used if the Optical Disc Drive is not the first device in the boot order.

---

---

**NOTE:** The following items of the BIOS setup information will be set as shown below.

- 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]
-

# SYSTEM DIAGNOSTICS

The System Diagnostics runs several tests on the server.

Select [Maintenance Tools] - [Test and diagnostics] in the EXPRESSBUILDER to diagnose the system.

---

## Test Items

The following items are tested during the 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 to avoid influence on the network.

---

---

**NOTE:** When checking the hard disk drive, no data is written on the disk.

---

---

## Startup and Exit of System Diagnostics

There are two ways to diagnose the server: using the local console (keyboard) of the server itself, and using the management PC via the serial port (remote console).

---

**IMPORTANT:** Use the serial port to execute System Diagnostics with remote console. The LAN connection is not for System Diagnostics.

---

The procedure to start the diagnostics program is as follows:

1. Shutdown the OS, power off the server, and 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 EXPRESSBUILDER DVD to start the system.

Select [Maintenance Tools (Normal mode)] when using the local console of the server, or select [Maintenance Tools (Redirection mode )] when using the remote console.

5. Select [English].

The following menu is displayed on the screen, when selecting [English].



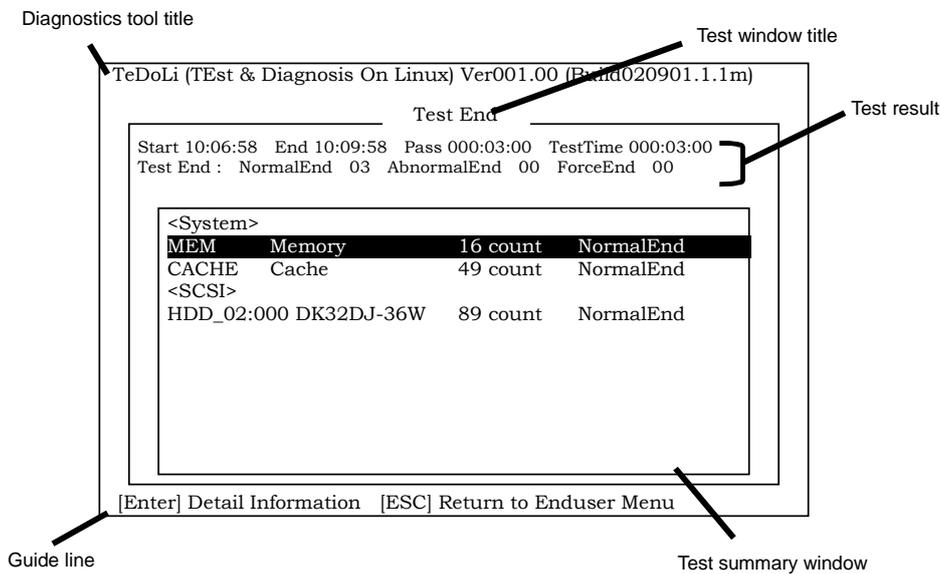
Local console



Remote console

6. Select [Test and diagnostics].

Select [End-User Mode] and the system diagnostics starts. The diagnostics are completed in approximately three minutes. Once the diagnostics are completed, the displayed screen changes as shown below:

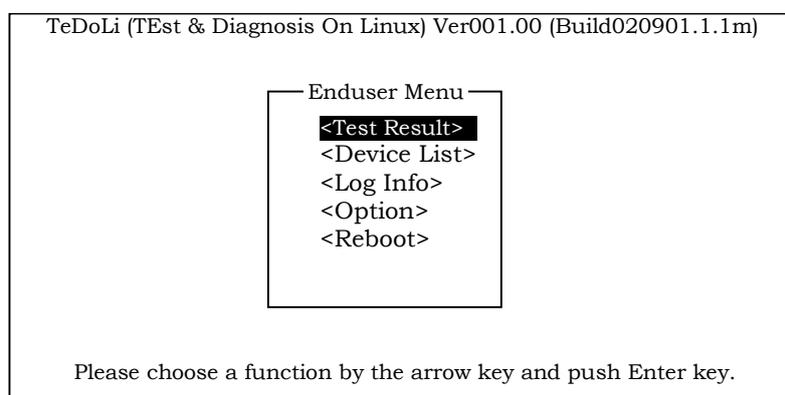


- Diagnostics tool title  
Shows the name and version of the diagnostic tool.
- Test window title  
Shows the diagnostics progress. "Test End" is displayed when the diagnostics are completed.
- Test result  
Shows the start, end, elapsed time and completion status of the diagnostics.
- Guide line
- Test 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 the list of connected devices.
- <Log Info> Shows the log information of the diagnostics. It can be saved on a floppy disk. To save it on a floppy disk, insert a formatted floppy disk in the floppy disk drive, and select <Save(F)>.
- <Option> Runs the various optional menu.
- <Reboot> Reboots the system.

8. Select <Reboot> in the [Enduser Menu] above.  
The server restarts and the system is started from the EXPRESSBUILDER.
9. Exit the EXPRESSBUILDER, and remove the DVD-ROM from the Optical Disc Drive.
10. Power off the server and unplug the power cord from the receptacle.
11. Reconnect all the LAN cables were 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:

<b>⚠ CAUTION</b>	
	<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 1-3 to 1-8 for details.</p> <p>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.</p>

---

### IMPORTANT:

- If the server needs to be relocated or stored, 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 shock the hard disk drives when relocating the server.
  - We recommend to store the server and the internal devices in a place without any temperature fluctuations, this will allow the devices to work normally after storage. Store the device in a place where temperature ranges between -10 to 55°C and humidity ranges between 20 to 80%, without condensation.
  - If you use the server after it was transported or relocated, check the system timer and adjust it if necessary. If the system timer advances or delays remarkably with the passage of time, contact your service representative to repair it.  
The server or the internal option device may have condensation in or on it when brought to a warm place from a cold place suddenly. Using a server or an internal device with dew attached may cause malfunction or failure.  
Make sure to adapt the devices to the operating environment before using them.
- 

1. Take any floppy disk or Optical Disc out of the server, if any.
2. Power off the server (the POWER LED is unlit).
3. Disengage the power cord from the lock spring.
4. Unplug the power cord of the server from the power outlet.
5. Remove all the cables from the server.
6. Remove the server from the rack cabinet.  
See Chapter 3 for details.
7. Hold the server by its bottom with at least another person to carry the server.
8. Protect the server with the shock-absorbing materials, and pack it securely.

# Chapter 8

---

## Troubleshooting

If your server does not operate as expected, read this chapter before contacting your service representative.

---

**NOTE:** For provision against an unexpected failure, we recommend you install the Off-line Maintenance Utility, NEC ESMPRO, to the server and client computers.

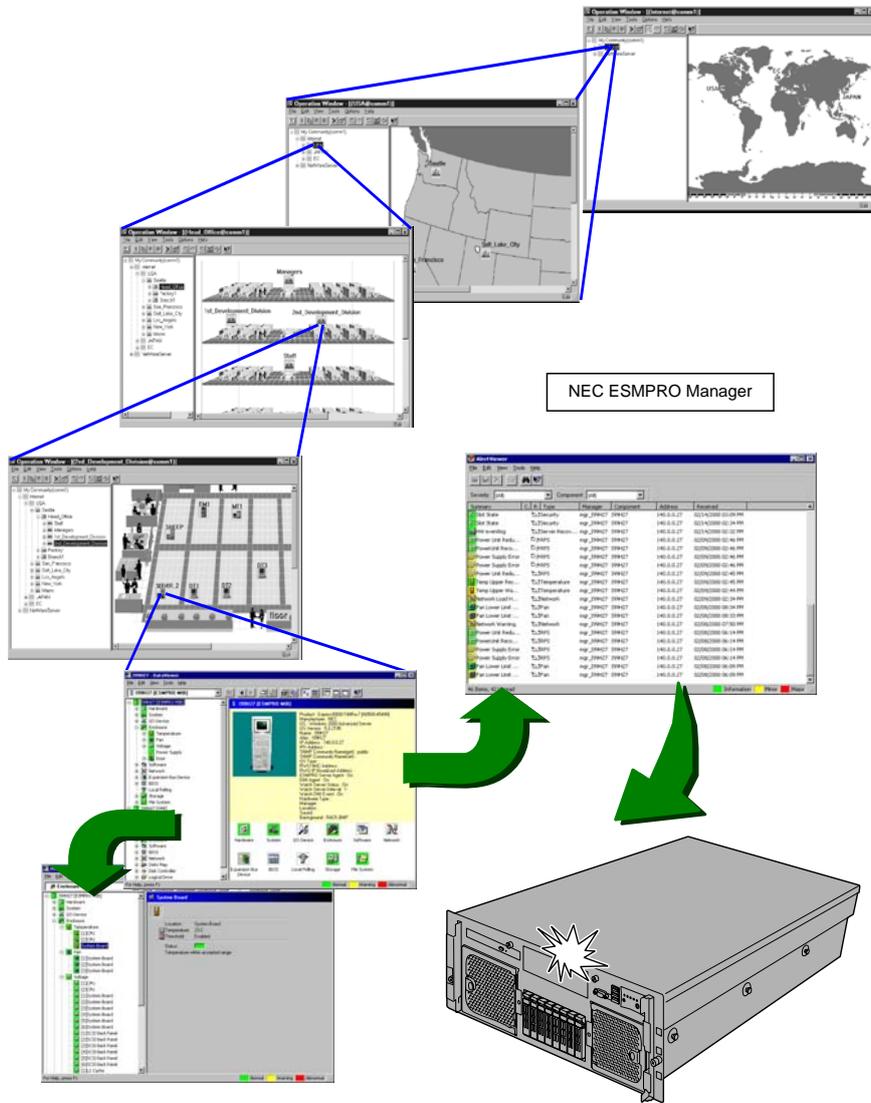
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# SYSTEM VIEWERS

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

Especially take note on whether any alert is reported on the Operation Window, DataView, or AlertViewer of NEC ESMPRO Manager.

[Example]

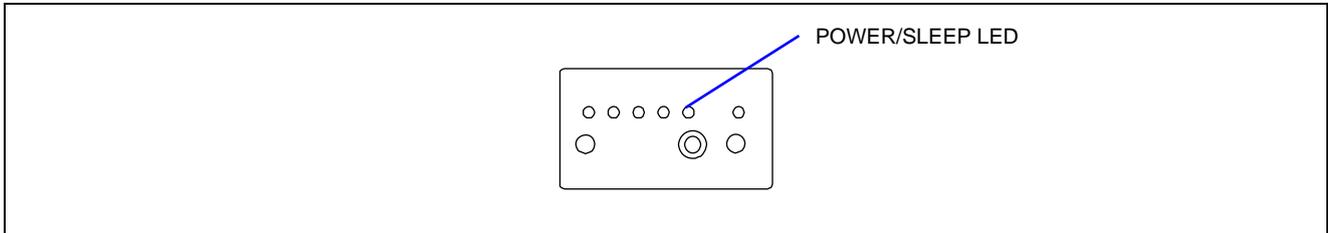


## LED

The following describes the server LEDs and their meaning.

---

### POWER/SLEEP LED



The green POWER/SLEEP LED lights to indicate normal operation while the server is powered on. When the server is powered off, the POWER/SLEEP LED stays unlit.

The POWER/SLEEP LED indicates that the server is running in a power-saving mode (sleep mode). If the OS supports a power-saving mode (such as Windows 2003), pressing the POWER/SLEEP switch makes the POWER/SLEEP LED blink in green and places the server in the power-saving mode.

Press the POWER/SLEEP switch to turn out the POWER/SLEEP LED and restore the server back in the normal mode.

The power-saving mode is only available when the OS supports the power-saving feature. Some operating systems allow you to set the server to automatically turn in the power-saving mode when no access is made to the server for a certain period of time or to select the power-saving mode using a command.

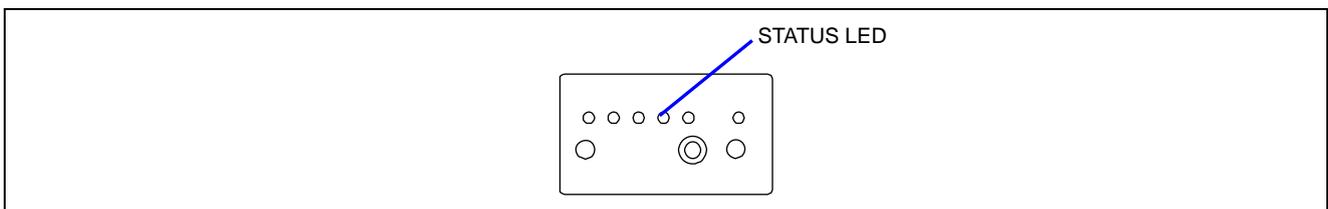
## STATUS LED

The STATUS LED lights green when the server is operating normally. When the STATUS LED is unlit, flashing in green or lit/flashing in amber, it indicates a server failure.

The following table lists the indications of the STATUS LED, descriptions, and actions to take.

### NOTES:

- If the server has the NEC ESMPRO or Off-line Maintenance Utility installed, you can view the System Event Log (SEL) to identify the cause of the trouble.
- To cycle power to the server, shut down the server from the OS and reboot it, if available. If it cannot be shut down from the OS, reset or execute a forced shut down or disconnect and connect the power cord to reboot the server.



STATUS LED indication	Description	Action
Flashing in green	The server is in operation with its processor degraded.	Contact your service representative. Start the BIOS SETUP and select [Main] - [Processor Settings] to identify the degraded processor and replace it as soon as possible. Or, start the BIOS SETUP and select [Main] - [Processor Settings] - [Processor Retest] - [Yes], and then select [Exit] - [Exit Saving Changes] to solve the problem.
	The server is in operation with its memory degraded.	Contact your service representative. Start the BIOS SETUP and select [Advanced] - [Memory Configuration] to identify the degraded memory (DIMM) and replace it as soon as possible. Or, start the BIOS SETUP and select [Advanced] - [Memory Configuration] - [Memory Retest] - [Yes], and then select [Exit] - [Exit Saving Changes] to solve the problem.
	A correctable memory or bus error was detected.	The system can function while the status LED flashes green but we recommend you contact your service representative.

<b>STATUS LED indication</b>	<b>Description</b>	<b>Action</b>
Unlit	The server is powered off.	Power on the server.
	POST is in progress.	Wait for a while. The STATUS LED will turn on a few seconds after the POST completion.
	A processor error occurred (IERR).	Cycle power to the server. If POST displays an error message, note the message and contact your service representative.
	A processor thermal error was detected. (Thermal-Trip)	
	A watchdog timer has timed out.	
	A PCI system error occurred.	
	A PCI parity error occurred.	
	An uncorrectable memory error was detected.	
	An uncorrectable bus error was detected.	
	POST terminates with error.	Wait until the memory dump is completed.
Memory dumping is requested.		
Lit in amber	A thermal error (critical) was detected.	Check the internal fans for dust or debris. Make sure that the fans are firmly connected. If this error indication persists, contact your service representative.
	A voltage error (critical) was detected.	Contact your service representative.
Flashing in amber	A power alarm was detected in a power supply unit.	Identify the failed power supply unit and contact your service representative.
	A fan alarm was detected.	Check the internal fans for dust or debris. Make sure that the fans are firmly connected. If this error indication persists, contact your service representative.
	A thermal error (warning) was detected.	Check the internal fans for dust or debris. Make sure that the fan are firmly connected. If this error indication persists, contact your service representative.
	A voltage error (warning) was detected.	Contact your service representative.
	A hard disk drive failed.	If the hard disk drives are in RAID configuration (RAID1, RAID5, RAID6, RAID10, or RAID50), a single failed hard disk drive does not affect the operation of the server. However, we recommend you 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.)

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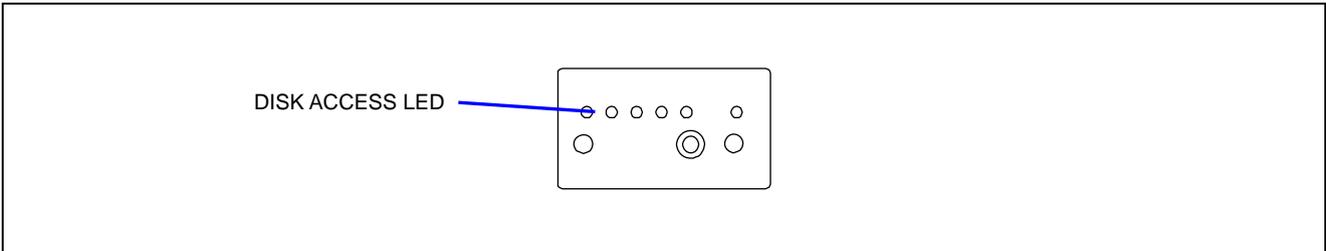
## DISK ACCESS LED

The DISK ACCESS LED indicates the state of hard disk drives in the 2.5-inch disk bay.

This LED lights in green every time a hard disk drive is accessed.

When the DISK ACCESS LED lights in amber, it indicates that a hard disk drive error occurred. To identify a failed hard disk drive, see the LEDs provided for each hard disk drive.

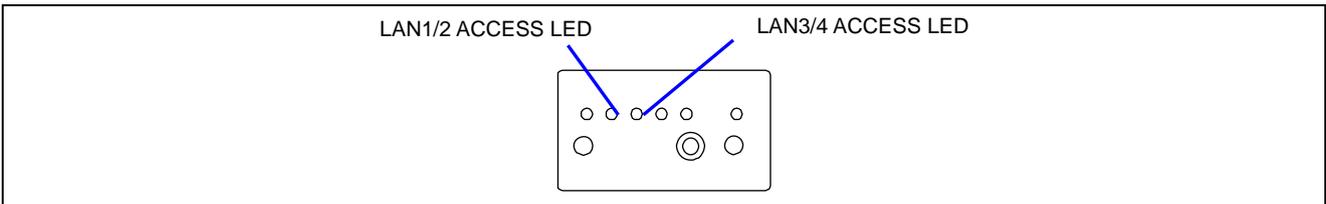
This LED blinks while rebuilding the hard disk drive.



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## LAN ACCESS LED

The LAN ACCESS LED lights green when the server is connected to LAN. The LED blinks while the server is accessed through the LAN (for packet transmission). The value "1" next to the icon indicates the network ports 1 and 2 on the rear panel. The value "2" next to the icon indicates the network ports 3 and 4 on the rear panel.



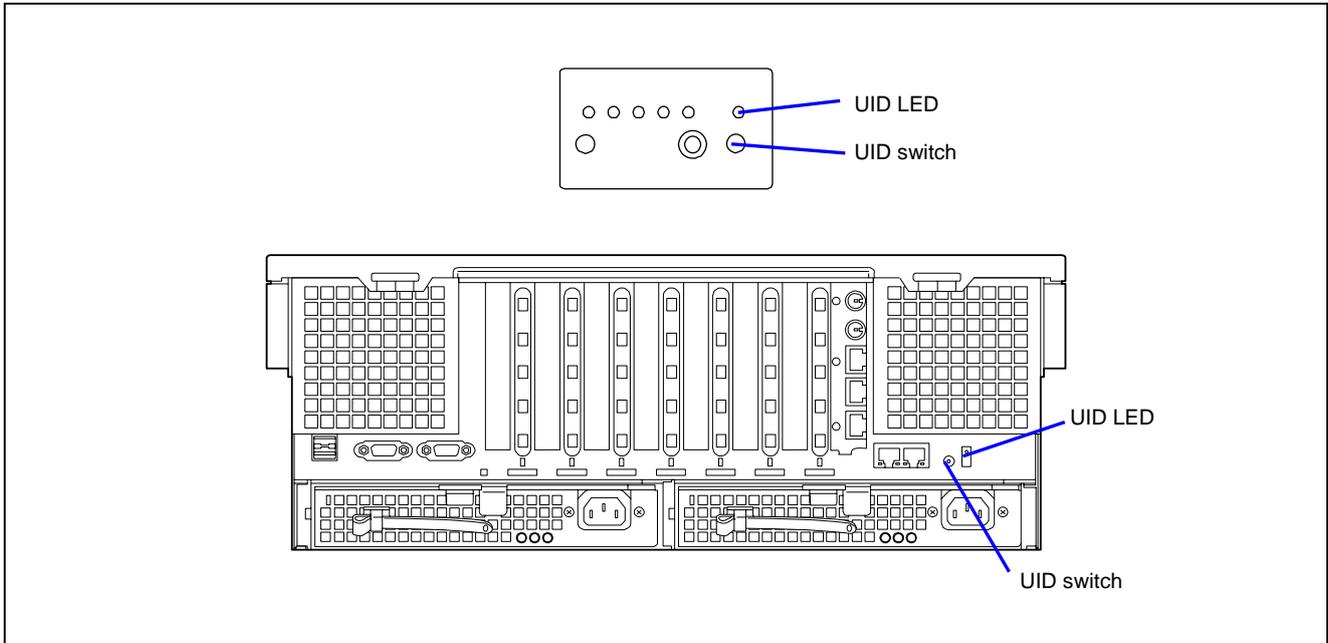
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## UID LED

Pressing the UID switch turns the UID LED located on the front and rear of the server on and off. The UID LED is visible through the rear of the chassis and allows you to locate the server you're working on from the rear of a rack.

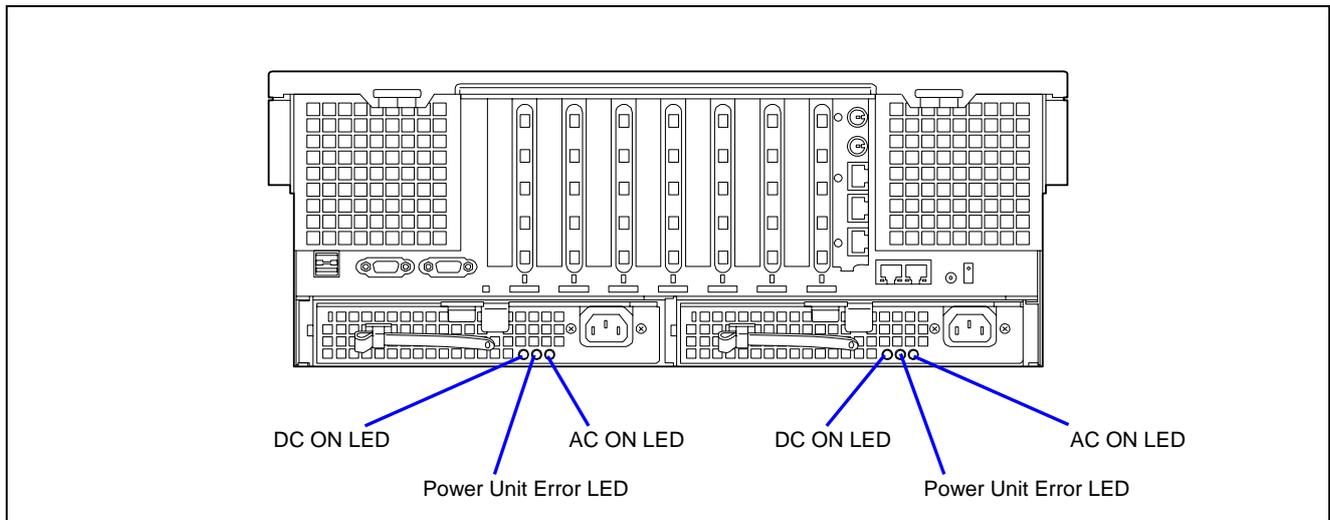
Pressing the UID switch again turns off the UID LED.

You can instruct the NEC ESMPRO Manager, NEC DianaScope, or the remote management feature of Web server to make the UID LED flash. Turn off the UID LED afterwards.



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## Power Unit LED



### Power Unit Error LED

The Power unit error LED lights amber when an error occurs on the power supply unit. Check the power unit error LED to identify the failed power supply unit.

### AC ON LED

The AC ON LED lights green when AC power is supplied to the power supply unit.

### DC ON LED

The DC ON LED lights green when the DC power is normally output.

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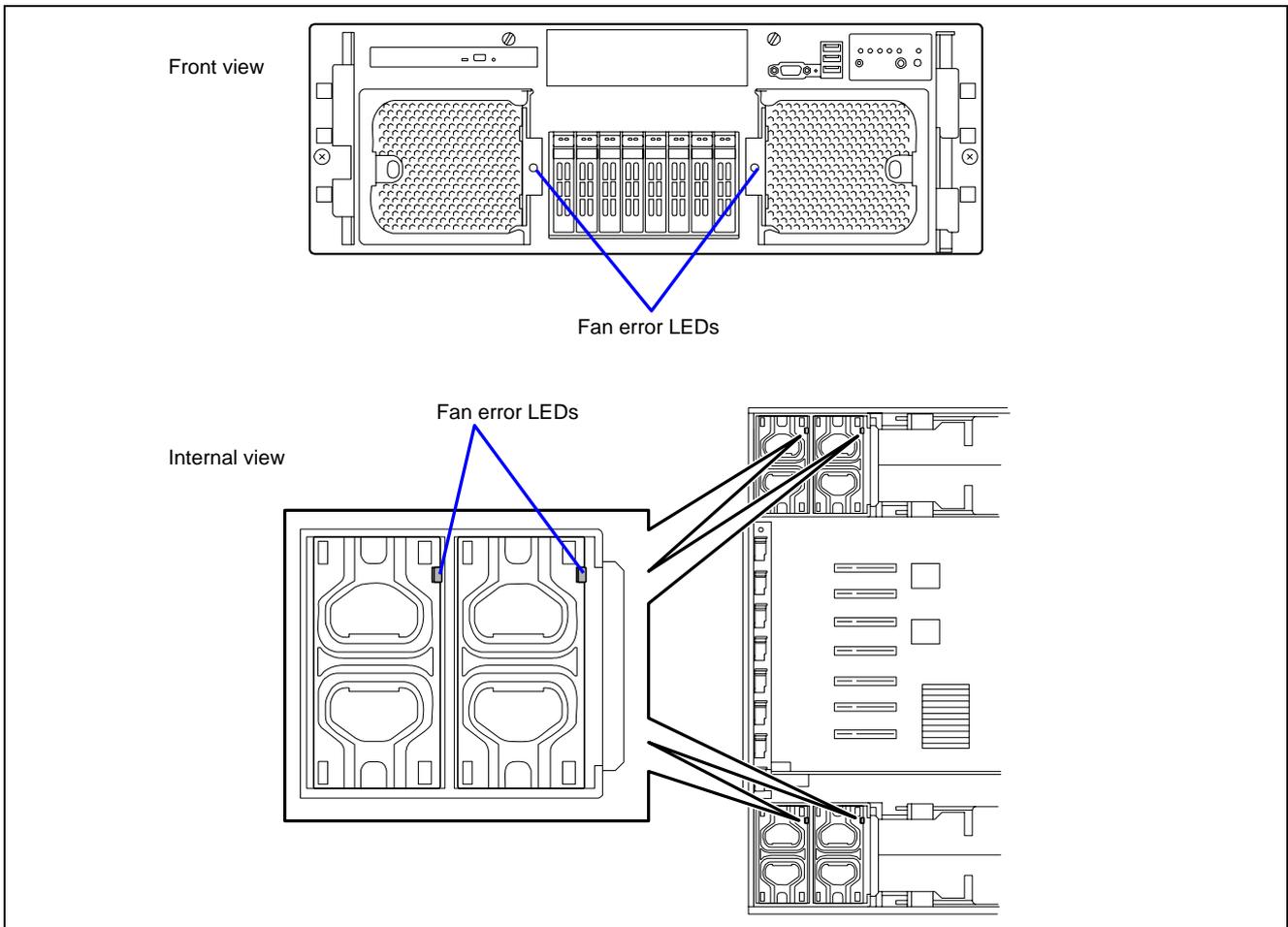
## Fan Error LED

A FAN Error LED is adjacent to each fan module. If a fan fails, the LED lights in amber. The failed fan may be hot-swapped.

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### IMPORTANT:

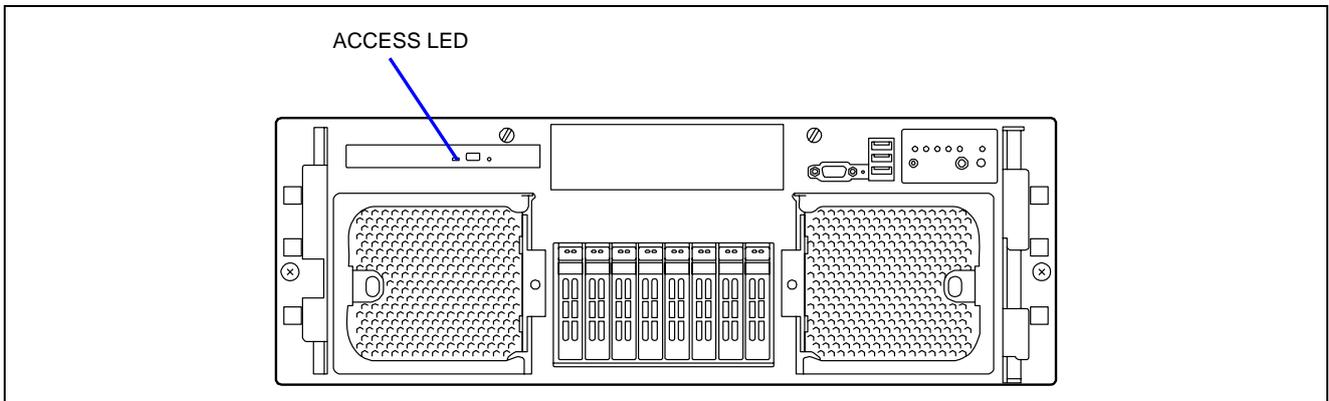
- Do not remove a fan that is operating normally. If a cooling fan fails, power off the system, and ask your service representative for the replacement of the cooling fan.
  - The chassis top cover must be installed for proper system cooling. Cooling components must be hot-swapped within two minutes. This time period applies starting from the time that the cooling component is physically removed, not from the time of the failure.
- 



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## Access LED

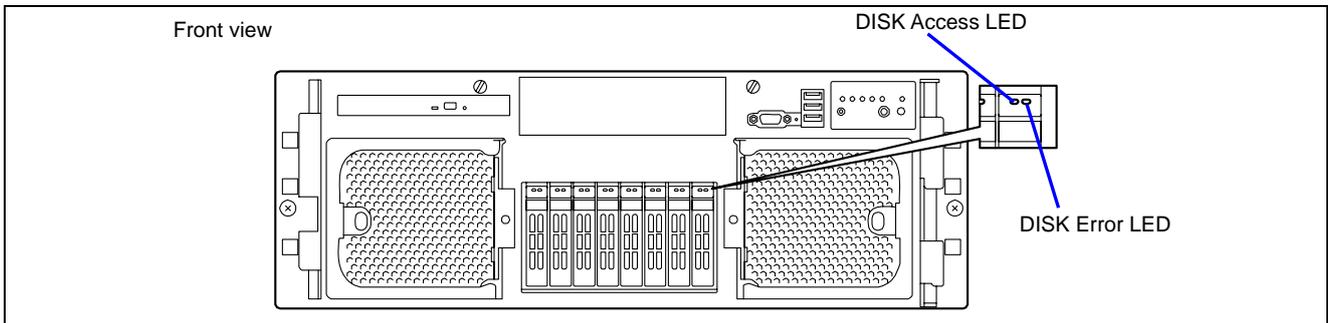
The access LEDs for the optical disc drive lights when the media in the drive is accessed.



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## Hard Disk Drive LED (DISK LED)

The disk LED on the 2.5-inch disk bay has different meanings depending on the display status.



### DISK Access LED

- **Blinking green**  
Indicates that the hard disk drive is being accessed.

### DISK Error LED

- **Lighting amber**  
Indicates that the hard disk drive is defective in the RAID System configuration.

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**NOTE:** While hard disk drives are in a RAID System configuration (RAID1/RAID5, RAID6, RAID10, or RAID50), a single failed hard disk drive does not affect the operation of the server. However, we recommend you 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.)

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- **Blinking amber**  
Indicates that the hard disk drive is being rebuilt (this status is not a failure). If the defective hard disk drive is replaced with a new one in the RAID System configuration, the data is automatically rebuilt (auto rebuild function). During the rebuild operation, the LED blinks amber.  
The LED goes off when the rebuild is terminated normally. The LED goes on amber if the rebuild fails.

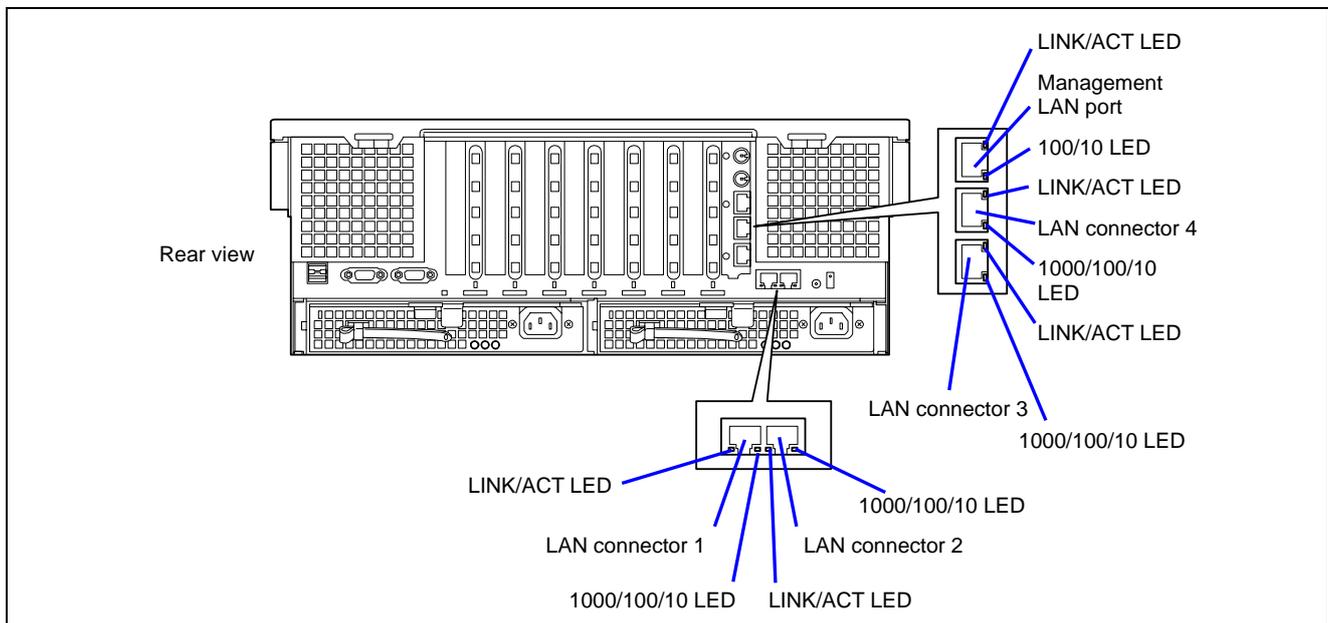
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**IMPORTANT:** To abort a rebuild, power off the server. In such a case, restart the server, hot-swap the failed hard disk drive, and restart rebuilding. Observe the following notes to use the auto-rebuild feature.

- Do not power off the server. (If the server is powered off before rebuilding hard disk drives, the auto-rebuild feature will not start.)
  - Wait at least 90 seconds between the removal of a failed hard disk drive and the installation of a new hard disk drive.
  - Do not replace another hard disk drive while a rebuilding is already in progress.
-

## LAN Connector LEDs

The three LAN ports (connectors) on the rear panel feature the following LEDs.



### ■ LINK/ACT LED

The LINK/ACT LED indicates the state of each network port normally equipped with the server. If power is supplied to the server and the hub and they are correctly connected with each other, the LED is lit in green (LINK state). If information is transmitted through a network port, the LED blinks green (ACT state).

If the LED does not light in the LINK state, check the network cable and the cable connection.

If the LED still does not light, the network (LAN) controller may be defective. Contact your service representative.

### ■ 1000/100/10 LED

The 1000/100/10 LED indicates whether the LAN1 to LAN4 ports normally equipped with the server are operated through the 1000BASE-T, 100BASE-TX or 10BASE-T network interface.

If the LED lights amber, the network port is operated through 1000BASE-T.

If the LED lights green, the network port is operated through 100BASE-TX.

If the LED does not light, the network port is operated through 10BASE-T.

### ■ 100/10 LED

The 100/10 indicates whether the management LAN port is operated through the 100BASE-TX or 10BASE-T network interface.

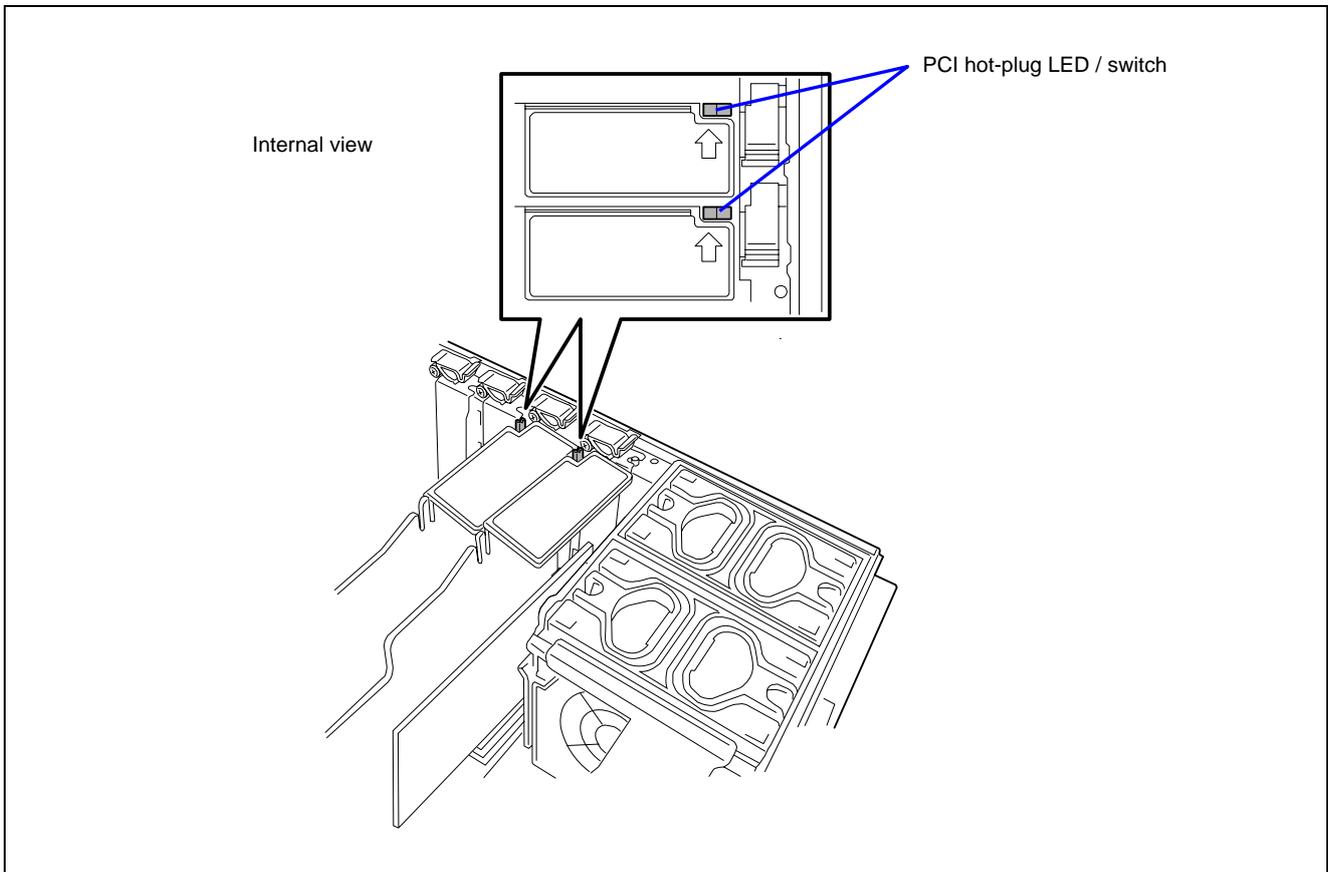
If the LED lights green, the network port is operated through 100BASE-TX.

If the LED does not light, the network port is operated through 10BASE-T.

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## PCI Slot LEDs

The PCI slots #1 and #2 on the rear panel have PCI hot-plug LEDs.



### PCI Hot-Plug LED

When the server is powered on, the power is supplied to the PCI board slot that contains the board, and the PCI slot power LEDs light green.

This LED is available only when the operating system is Windows Server 2003.

If the driver of a Hot Plug PCI board is stopped and then the PCI board is logically disconnected from the system, or if a PCI board is being installed or setup, this LED blinks in green.

When the PCI board is disconnected and the slot is powered off, this LED goes off.

If an error occurred on the PCI board or the slot in which is installed the PCI board, this LED lights in amber.

## ERROR MESSAGES

If an error occurs in the server, an error message appears on the display unit connected to the server.

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### 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 a suggested corrective measure on the display unit.

Follow the table below to troubleshoot such errors.

Note that even when there is no hardware failure, using the keyboard or mouse at the times listed below causes the POST to assume a keyboard controller error and stop processing.

- Immediately after the server is powered on
- Immediately after the system was rebooted in response to a keyboard instruction (simultaneous key entry of **Ctrl + Alt + Delete**)
- Immediately after the system was rebooted in response to an OS instruction
- During the hardware initialization following the restart of the POST

When the POST detects a hardware failure due to one of the above reasons, restart the server once again. If the error message does not reappear, you can 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 is displayed on the screen.
- Do not make any keyboard entry or use the mouse before the start-up message of the SCSI Configuration Utility is displayed on the screen following the server reboot.

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**IMPORTANT:** Note the on-screen messages before contacting your service representative.

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## POST Error Messages

When the POST detects an error, it displays an error message on the display unit screen. The following table lists the error messages, their descriptions, and the actions to take.

On-screen error messages related to devices such as processor, memory, and fans and installation locations are associated as shown in the figure on pages 8-24 to 8-28.

**IMPORTANT:** Note the messages that are displayed before consulting with your service representative. Alarm messages include useful information for maintenance. The IPMI information is also useful for maintenance purposes.

Error code	Error message	Recommended Action
0220	Monitor type does not match CMOS - Run SETUP.	Start the SETUP. If the error cannot be corrected, 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. (Restart the computer, and 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.
0270	Real time clock error.	If the error occurs again, contact your service representative.
0271	Check date and time setting.	
0280	Previous boot incomplete – Default configuration used	Contact your service representative.
02D0	System cache error - Cache disabled.	The cache cannot be used. Contact your service representative.
02D1	System Memory exceeds the CPU's caching limit.	Contact your service representative.
02F5	DMA Test Failed.	
02F6	Software NMI Failed.	
02F7	Fail-safe Timer NMI Failed.	
0615	COM B configuration changed.	Contact your service representative.
0616	COM B config. error - device disabled.	
0B28	Unsupported Processor detected on Processor 1.	Make sure that the server supports the processor. If you are not sure, contact your service representative to request the maintenance.
0B29	Unsupported Processor detected on Processor 2.	
0B2A	Unsupported Processor detected on Processor 3.	
0B2B	Unsupported Processor detected on Processor 4.	
0B50	Processor #1 with error taken off line.	The processor is degraded. Contact your service representative.
0B51	Processor #2 with error taken offline.	
0B52	Processor #3 with error taken offline.	
0B53	Processor #4 with error taken offline.	
0B5F	Forced to use Processor with error	Because an error is detected in every processor, the system is forcibly started. Contact your service representative.
0B70	The error occurred during temperature sensor	Contact your service representative.

<b>Error code</b>	<b>Error message</b>	<b>Recommended Action</b>
	reading.	
0B71	System Temperature out of the range.	A fan failure or fan clogging may be occurring. Contact your service representative to request the maintenance.
0B74	The error occurred during voltage sensor reading.	Contact your service representative.
0B75	System voltage out of the range.	
0B78	The error occurred during fan sensor reading	
0B7C	The error occurred during redundant power module confirmation	Contact you service representative to replace the power supply unit.
0B7D	The normal operation can't be guaranteed with use of only one PSU	Contact you service representative to add an additional power supply unit or replace the existing power supply unit.
0B7E	Mismatch AC Voltage detected.	Check if the same voltage (100 or 200 VAC) is input to both power supply units. Check the installation status of the power supply units. If the error cannot be corrected, contact your service representative.
0B7F	Insufficient Power Supply Unit Configuration	Check the installation status of power supply units. If the error cannot be corrected, contact your service representative.
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.	
0B8B	BMC progress check timeout.	
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.	
0B92	Internal Use Area of BMC FRU corrupted.	All the commands and functions other than the FRU command and the EMP function can be used. 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.
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.	All the functions other than the function of accessing to SMC through IPMB can be used. 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.	All the commands and functions other than the FRU command and the EMP function can be used. 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

<b>Error code</b>	<b>Error message</b>	<b>Recommended Action</b>
0B97	BMC SEL device failure.	server. If the error cannot be corrected, contact your service representative.
0B98	BMC RAM test error.	
0B99	BMC Fatal hardware error.	
0B9B	Private I2C bus not responding.	
0B9C	BMC internal exception.	
0B9D	BMC A/D timeout error.	
0B9E	SDR repository corrupt.	
0B9F	SEL corrupt.	
0BB0	SMBIOS - SROM data read error.	Contact your service representative.
0BB1	SMBIOS - SROM data checksum bad.	
0BC0	POST detected startup failure of 1st Processor.	Contact your service representative to replace the processor.
0BC1	POST detected startup failure of 2nd Processor.	
0BC2	POST detected startup failure of 3rd Processor.	
0BC3	POST detected startup failure of 4th Processor.	
8150	NVRAM Cleared By Jumper.	Turn off the power. Recover the jumper setting to the original setting.
8151	Password Cleared By Jumper.	
8160	Mismatch Processor Speed detected on Processor 1.	Check the frequency of the processor. If it is unknown, contact your service representative.
8161	Mismatch Processor Speed detected on Processor 2.	
8162	Mismatch Processor Speed detected on Processor 3.	
8163	Mismatch Processor Speed detected on Processor 4.	
8170	Processor 1 not operating at intended frequency	
8171	Processor 2 not operating at intended frequency	
8172	Processor 3 not operating at intended frequency	
8173	Processor 4 not operating at intended frequency	
817F	All processors not operating at intended frequency	
81A0	Cache Cautionary status detected on Processor 1.	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.
81A1	Cache Cautionary status detected on Processor 2.	
81A2	Cache Cautionary status detected on Processor 3.	
81A3	Cache Cautionary status detected on Processor 4.	
8200	Online Spare Memory was not ready.	A DIMM type mismatch is detected when the online spare memory feature is enabled. Contact your service representative.
8201	Mirroring Memory was not ready.	A DIMM type mismatch is detected or unnecessary installation in group #2 is detected when the memory mirroring feature is enabled. Check the DIMM type or installation. If the error cannot be corrected, contact your service representative.
8280	DIMM #1 has been disabled	The DIMM numbers included in the error message are as show below. DIMM #1 to DIMM #8:
8281	DIMM #2 has been disabled	
8282	DIMM #3 has been disabled	

Error code	Error message	Recommended Action
8283	DIMM #4 has been disabled	DIMM #1 to DIMM #8 on memory board A DIMM #9 to DIMM #16: DIMM #1 to DIMM #8 on memory board B DIMM #17 to DIMM #24: DIMM #1 to DIMM #8 on memory board C DIMM #25 to DIMM #32: DIMM #1 to DIMM #8 on memory board D  1. Run the BIOS SETUP, select [Advanced] - [Memory Configuration] - [Memory Retest] - [Yes], then select [Exit] - [Exit Saving Changes]. 2. Check the installation status of the failed DIMM. 3. Replace the failed DIMM. 4. Replace the relevant memory board. 5. If the error persists, contact your service representative.  Note: The detailed error information can be obtained by viewing the IPMI system event log.
8284	DIMM #5 has been disabled	
8285	DIMM #6 has been disabled	
8286	DIMM #7 has been disabled	
8287	DIMM #8 has been disabled	
8288	DIMM #9 has been disabled	
8289	DIMM #10 has been disabled	
828A	DIMM #11 has been disabled	
828B	DIMM #12 has been disabled	
828C	DIMM #13 has been disabled	
828D	DIMM #14 has been disabled	
828E	DIMM #15 has been disabled	
828F	DIMM #16 has been disabled	
8290	DIMM #17 has been disabled	
8291	DIMM #18 has been disabled	
8292	DIMM #19 has been disabled	
8293	DIMM #20 has been disabled	
8294	DIMM #21 has been disabled	
8295	DIMM #22 has been disabled	
8296	DIMM #23 has been disabled	
8297	DIMM #24 has been disabled	
8298	DIMM #25 has been disabled	
8299	DIMM #26 has been disabled	
829A	DIMM #27 has been disabled	
829B	DIMM #28 has been disabled	
829C	DIMM #29 has been disabled	
829D	DIMM #30 has been disabled	
829E	DIMM #31 has been disabled	
829F	DIMM #32 has been disabled	
82A0	Unsupported DIMM detected in DIMM #1	The DIMM numbers included in the error message are as show below. DIMM #1 to DIMM #8: DIMM #1 to DIMM #8 on memory board A DIMM #9 to DIMM #16: DIMM #1 to DIMM #8 on memory board B DIMM #17 to DIMM #24: DIMM #1 to DIMM #8 on memory board C DIMM #25 to DIMM #32: DIMM #1 to DIMM #8 on memory board D  1. Take one of the following measures to reboot (reset) the server. * Issue an OS command. * Press Ctrl + Alt + Del. * Press the RESET switch. * Issue a command from the Web browser of EXPRESSSCOPE Engine 2 or NEC DianaScope Manager.  2. Replace the DIMM that has been replaced or additionally installed. 3. Replace the failed DIMM. 4. Replace the relevant memory board. 5. If the error persists, contact your service representative.
82A1	Unsupported DIMM detected in DIMM #2	
82A2	Unsupported DIMM detected in DIMM #3	
82A3	Unsupported DIMM detected in DIMM #4	
82A4	Unsupported DIMM detected in DIMM #5	
82A5	Unsupported DIMM detected in DIMM #6	
82A6	Unsupported DIMM detected in DIMM #7	
82A7	Unsupported DIMM detected in DIMM #8	
82A8	Unsupported DIMM detected in DIMM #9	
82A9	Unsupported DIMM detected in DIMM #10	
82AA	Unsupported DIMM detected in DIMM #11	
82AB	Unsupported DIMM detected in DIMM #12	
82AC	Unsupported DIMM detected in DIMM #13	
82AD	Unsupported DIMM detected in DIMM #14	
82AE	Unsupported DIMM detected in DIMM #15	
82AF	Unsupported DIMM detected in DIMM #16	
82B0	Unsupported DIMM detected in DIMM #17	
82B1	Unsupported DIMM detected in DIMM #18	
82B2	Unsupported DIMM detected in DIMM #19	
82B3	Unsupported DIMM detected in DIMM #20	
82B4	Unsupported DIMM detected in DIMM #21	
82B5	Unsupported DIMM detected in DIMM #22	
82B6	Unsupported DIMM detected in DIMM #23	
82B7	Unsupported DIMM detected in DIMM #24	
82B8	Unsupported DIMM detected in DIMM #25	
82B9	Unsupported DIMM detected in DIMM #26	
82BA	Unsupported DIMM detected in DIMM #27	
82BB	Unsupported DIMM detected in DIMM #28	

Error code	Error message	Recommended Action
82BC	Unsupported DIMM detected in DIMM #29	<p>The DIMM numbers included in the error message are as show below.</p> <p>DIMM #1 to DIMM #8: DIMM #1 to DIMM #8 on memory board A</p> <p>DIMM #9 to DIMM #16: DIMM #1 to DIMM #8 on memory board B</p> <p>DIMM #17 to DIMM #24: DIMM #1 to DIMM #8 on memory board C</p> <p>DIMM #25 to DIMM #32: DIMM #1 to DIMM #8 on memory board D</p> <ol style="list-style-type: none"> <li>1. Take one of the following measures to reboot (reset) the server. <ul style="list-style-type: none"> <li>* Issue an OS command.</li> <li>* Press Ctrl + Alt + Del.</li> <li>* Press the RESET switch.</li> <li>* Issue a command from the Web browser of EXPRESSSCOPE Engine 2 or NEC DianaScope Manager.</li> </ul> </li> <li>2. Replace the DIMM that has been replaced or additionally installed.</li> <li>3. Replace the failed DIMM.</li> <li>4. Replace the relevant memory board.</li> <li>5. If the error persists, contact your service representative.</li> </ol>
82BD	Unsupported DIMM detected in DIMM #30	
82BE	Unsupported DIMM detected in DIMM #31	
82BF	Unsupported DIMM detected in DIMM #32	
82C0	Mismatch DIMM Type detected in DIMM #1	
82C1	Mismatch DIMM Type detected in DIMM #2	
82C2	Mismatch DIMM Type detected in DIMM #3	
82C3	Mismatch DIMM Type detected in DIMM #4	
82C4	Mismatch DIMM Type detected in DIMM #5	
82C5	Mismatch DIMM Type detected in DIMM #6	
82C6	Mismatch DIMM Type detected in DIMM #7	
82C7	Mismatch DIMM Type detected in DIMM #8	
82C8	Mismatch DIMM Type detected in DIMM #9	
82C9	Mismatch DIMM Type detected in DIMM #10	
82CA	Mismatch DIMM Type detected in DIMM #11	
82CB	Mismatch DIMM Type detected in DIMM #12	
82CC	Mismatch DIMM Type detected in DIMM #13	
82CD	Mismatch DIMM Type detected in DIMM #14	
82CE	Mismatch DIMM Type detected in DIMM #15	
82CF	Mismatch DIMM Type detected in DIMM #16	
82D0	Mismatch DIMM Type detected in DIMM #17	
82D1	Mismatch DIMM Type detected in DIMM #18	
82D2	Mismatch DIMM Type detected in DIMM #19	
82D3	Mismatch DIMM Type detected in DIMM #20	
82D4	Mismatch DIMM Type detected in DIMM #21	
82D5	Mismatch DIMM Type detected in DIMM #22	
82D6	Mismatch DIMM Type detected in DIMM #23	
82D7	Mismatch DIMM Type detected in DIMM #24	
82D8	Mismatch DIMM Type detected in DIMM #25	
82D9	Mismatch DIMM Type detected in DIMM #26	
82DA	Mismatch DIMM Type detected in DIMM #27	
82DB	Mismatch DIMM Type detected in DIMM #28	
82DC	Mismatch DIMM Type detected in DIMM #29	
82DD	Mismatch DIMM Type detected in DIMM #30	
82DE	Mismatch DIMM Type detected in DIMM #31	
82DF	Mismatch DIMM Type detected in DIMM #32	
82E0	DIMM #1 with error is enabled	<p>The DIMM numbers included in the error message are as show below.</p> <p>DIMM #1 to DIMM #8: DIMM #1 to DIMM #8 on memory board A</p> <p>DIMM #9 to DIMM #16: DIMM #1 to DIMM #8 on memory board B</p> <p>DIMM #17 to DIMM #24: DIMM #1 to DIMM #8 on memory board C</p> <p>DIMM #25 to DIMM #32: DIMM #1 to DIMM #8 on memory board D</p> <ol style="list-style-type: none"> <li>1. Run BIOS SETUP, select [Advanced] - [Memory Configuration] - [Memory Retest] - [Yes], then select [Exit] - [Exit Saving Changes].</li> <li>2. Check the installation status of failed DIMM.</li> <li>3. Replace the failed DIMM.</li> <li>4. Replace the relevant memory board.</li> <li>5. If the error persists, contact your service representative.</li> </ol> <p>Note: The detailed error information can be obtained by viewing the IPMI system event log. If the processor was replaced, restart the server</p>
82E1	DIMM #2 with error is enabled	
82E2	DIMM #3 with error is enabled	
82E3	DIMM #4 with error is enabled	
82E4	DIMM #5 with error is enabled	
82E5	DIMM #6 with error is enabled	
82E6	DIMM #7 with error is enabled	
82E7	DIMM #8 with error is enabled	
82E8	DIMM #9 with error is enabled	
82E9	DIMM #10 with error is enabled	
82EA	DIMM #11 with error is enabled	
82EB	DIMM #12 with error is enabled	
82EC	DIMM #13 with error is enabled	
82ED	DIMM #14 with error is enabled	
82EE	DIMM #15 with error is enabled	
82EF	DIMM #16 with error is enabled	
82F0	DIMM #17 with error is enabled	
82F1	DIMM #18 with error is enabled	
82F2	DIMM #19 with error is enabled	
82F3	DIMM #20 with error is enabled	
82F4	DIMM #21 with error is enabled	

Error code	Error message	Recommended Action
82F5	DIMM #22 with error is enabled	and run BIOS SETUP. Select [Main] - [Processor Settings] - [Processor Retest] - [Yes], then select [Exit] - [Exit Saving Changes].
82F6	DIMM #23 with error is enabled	
82F7	DIMM #24 with error is enabled	
82F8	DIMM #25 with error is enabled	
82F9	DIMM #26 with error is enabled	
82FA	DIMM #27 with error is enabled	
82FB	DIMM #28 with error is enabled	
82FC	DIMM #29 with error is enabled	
82FD	DIMM #30 with error is enabled	
82FE	DIMM #31 with error is enabled	
82FF	DIMM #32 with error is enabled	
8700	Mismatch BMC PIA detected. [200V Non-Redundant]	<ol style="list-style-type: none"> <li>1. Apply the PIA appropriate to the AC input voltage and device configuration. The server is configured to use a 100 VAC non-redundant power supply unit. If you changed the configuration, update the PIA (see "Power Supplies" in Chapter 2).</li> <li>2. If the error persists, contact your service representative.</li> </ol>
8701	Mismatch BMC PIA detected. [100V Redundant / 100V Non-Redundant]	
8702	Mismatch BMC PIA detected. [100V Non-Redundant]	

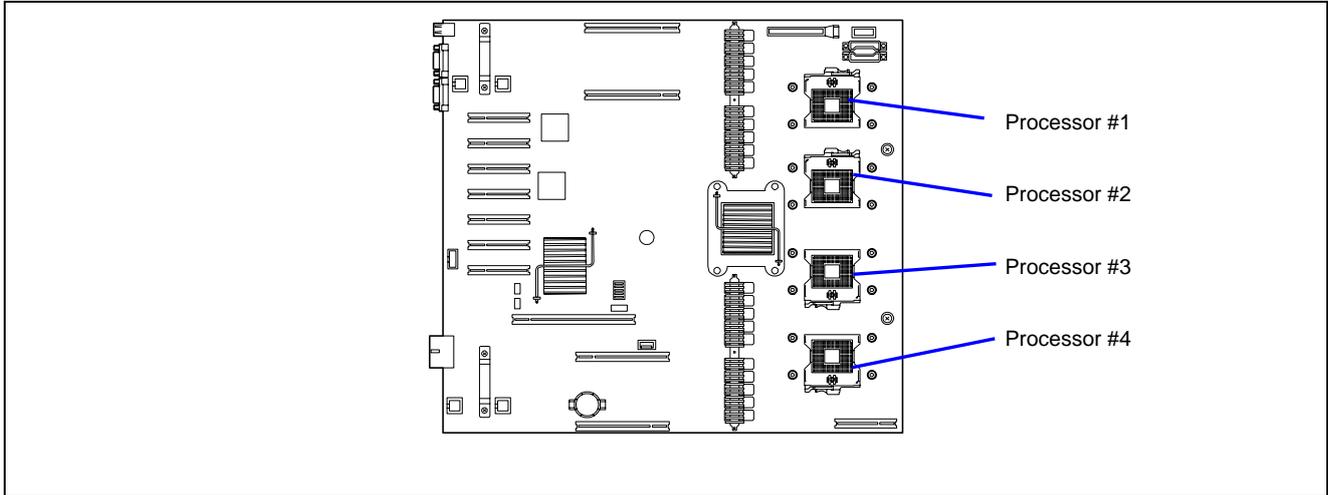
The following figures show the location of the specific components referenced in the POST error codes and messages table listed above.

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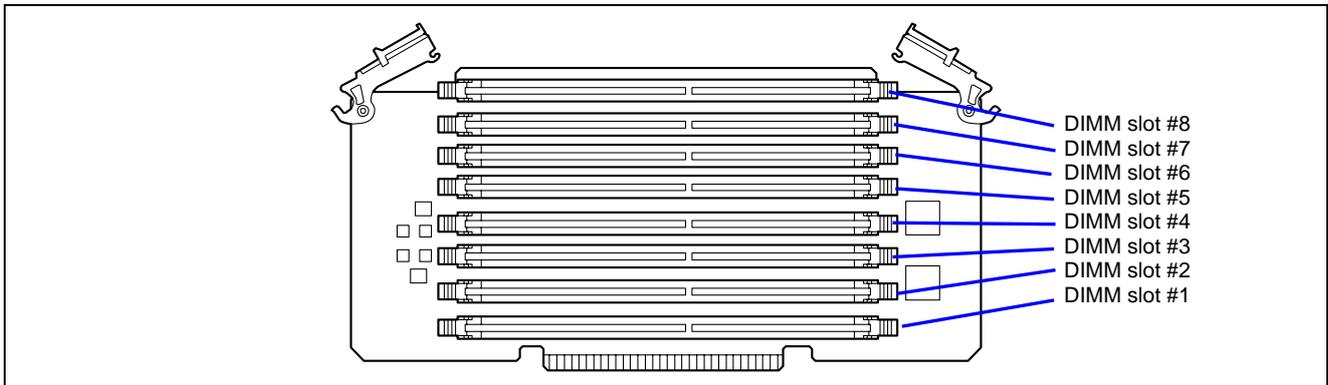
**NOTE:** Failed processor or memory boards can be also identified with the BIOS SETUP utility.

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■ Processors



■ DIMMs



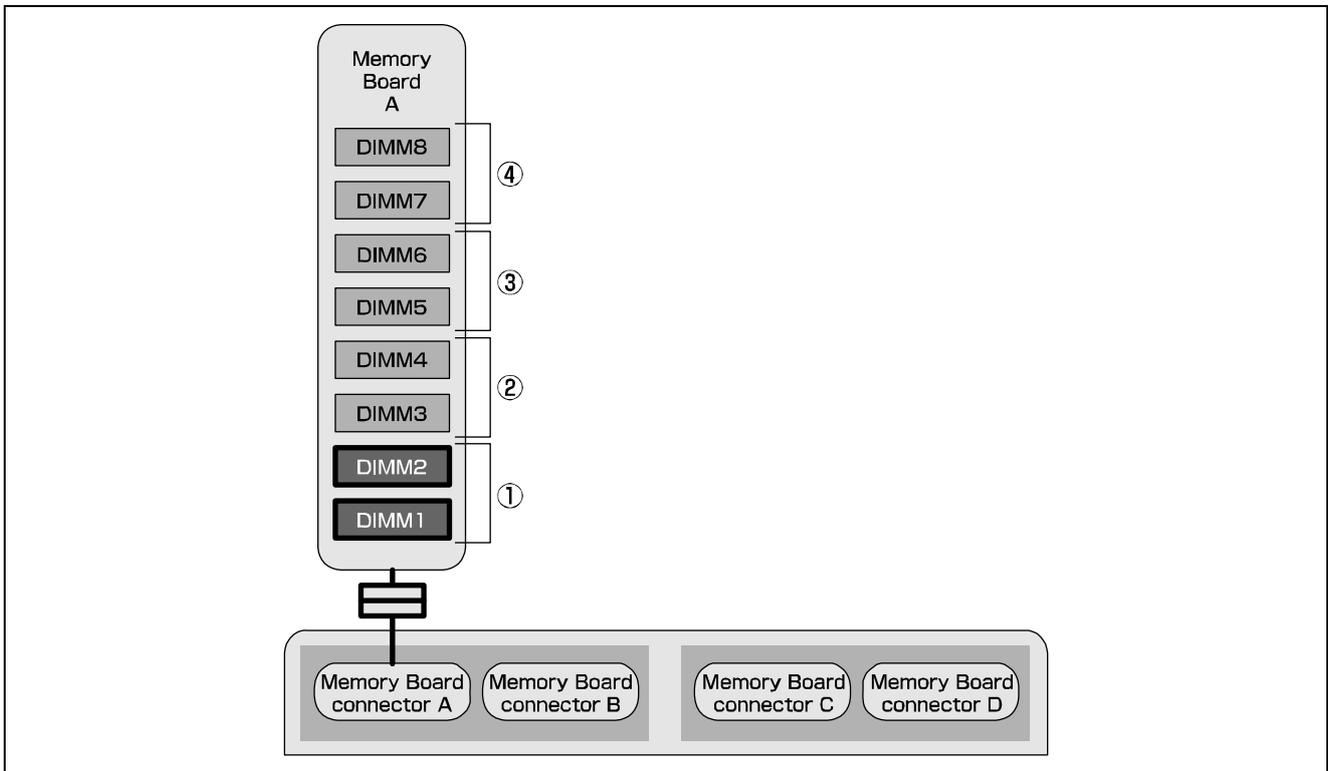
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**IMPORTANT:** Two DIMMs to be installed must have same size and capacity. If the DIMMs are incorrectly installed, the system will fail to start.

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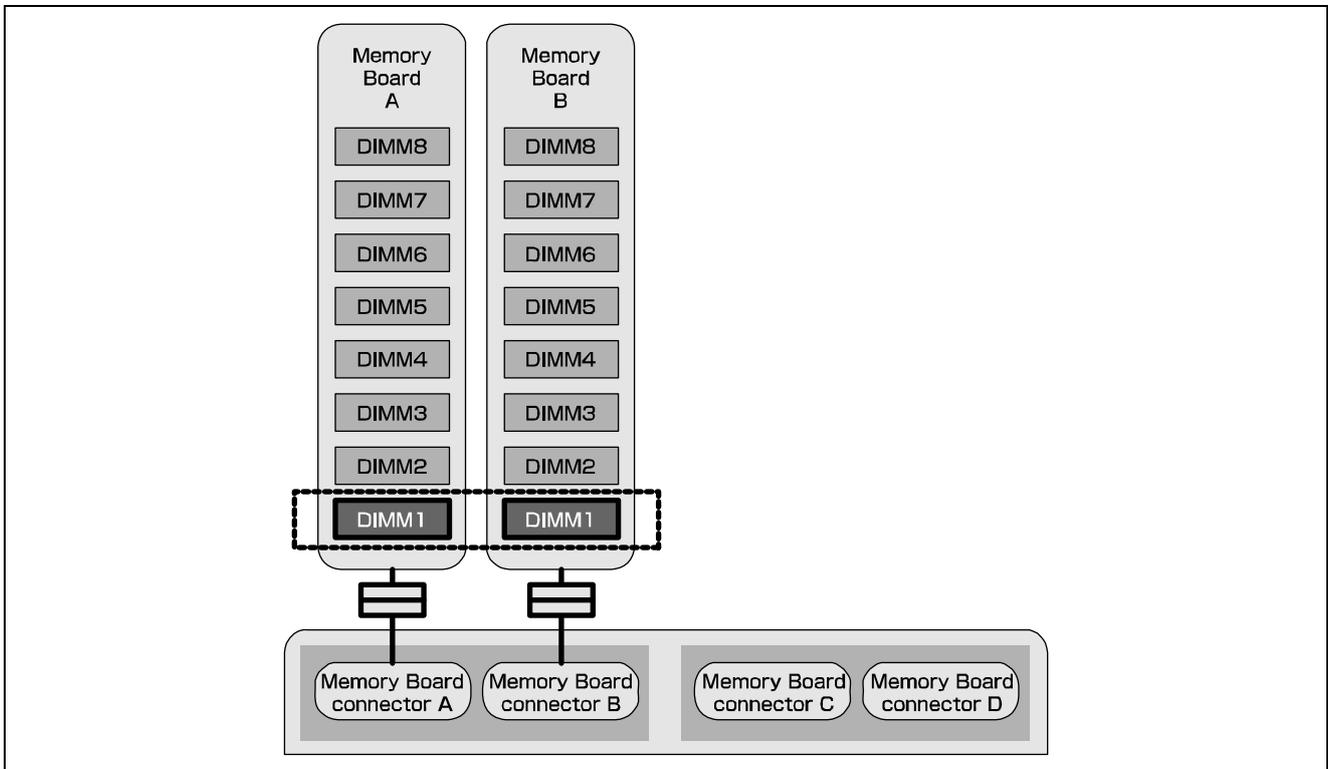
## With a single memory board installed

Install DIMMs (a pair of two) in two slots (starting with the smallest number).



## With two memory boards installed

- Install two DIMMs of the same size and capacity in slots with identical numbers of each memory board.
- Install DIMMs (a pair of two) in the slots (starting with the smallest number) of each memory board.



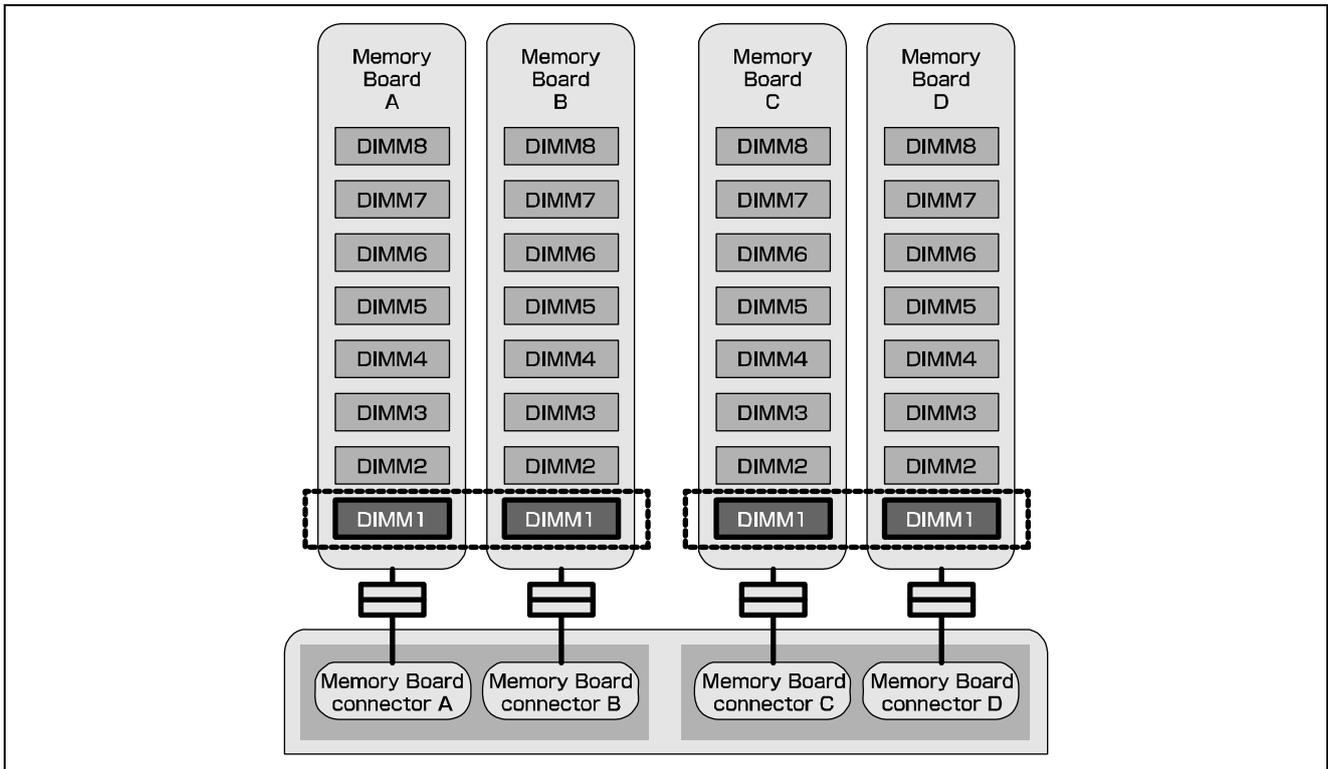
## With four memory boards installed

- Install two DIMMs of the same size and capacity in slots with identical numbers of each memory board #A and #B. Install another two DIMMs of the same size and capacity in slots with identical numbers of each memory board #C and #D.
- Install DIMMs (a pair of two) in the slots (starting with the smallest number) of each memory board.

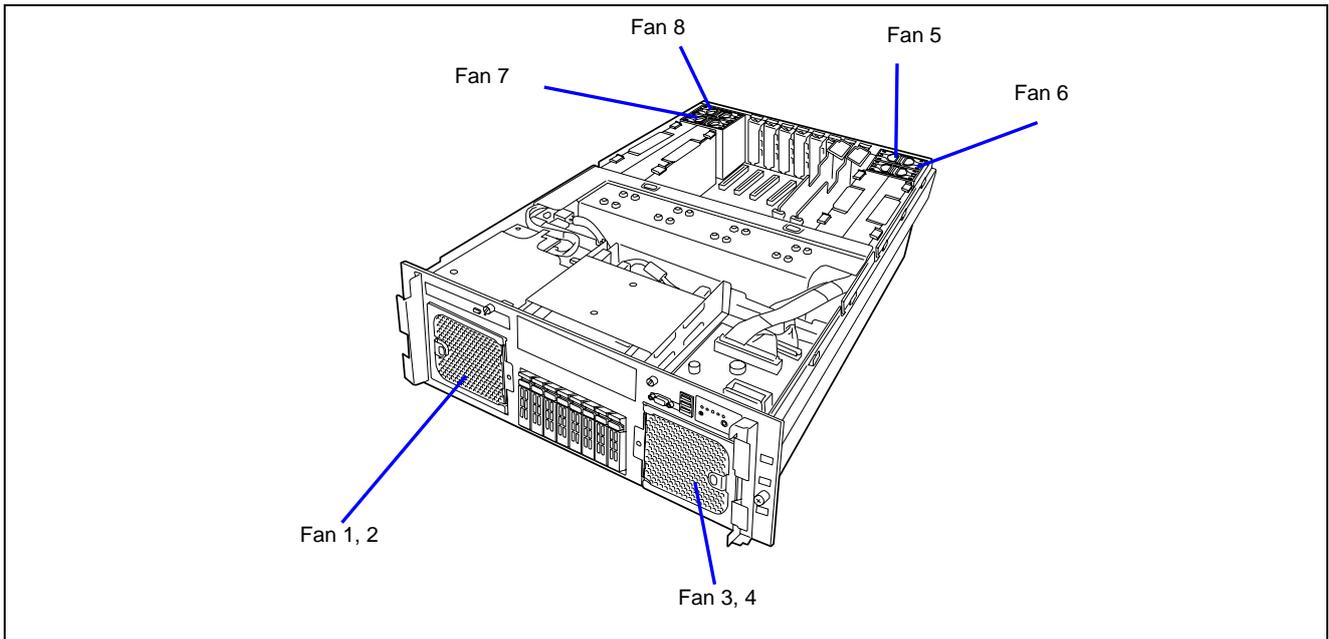
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### NOTES:

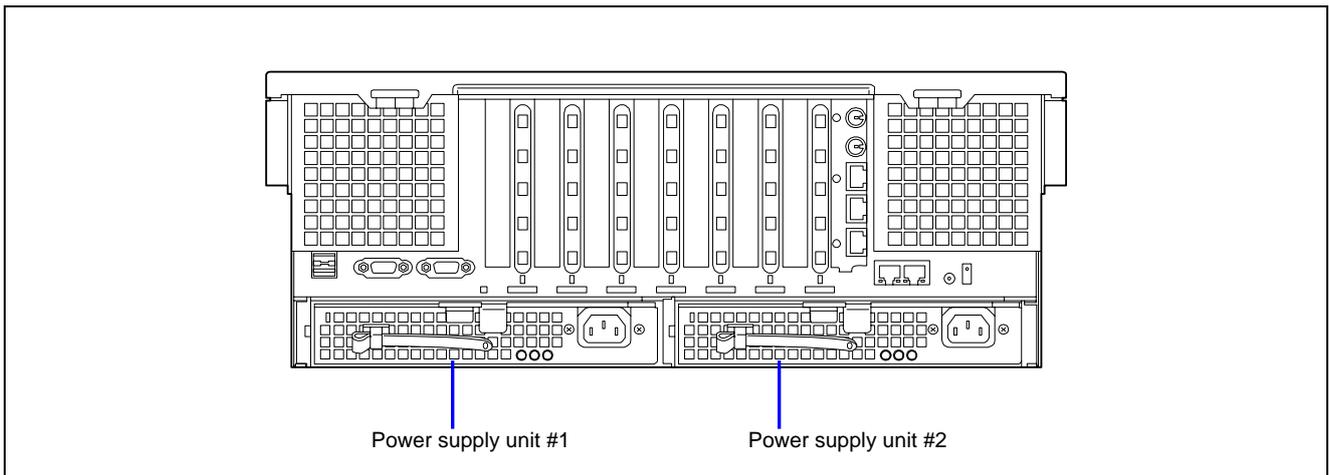
- To enable the memory mirroring feature, the configuration of the memory boards #A and #B, or #C and #D must be identical.
  - To enable the memory chipkill feature, two or four memory boards are required.
- 



■ Fans



■ Power supply unit



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## Beep Codes

If an error occurs during the POST, the server beeps, indicating the type of error.

Each number indicates the number of short beeps, and a hyphen indicates a pause. For example, the beep interval 1-3-3-1 indicates 1 beep, pause, 3 beeps, pause, 3 beeps, pause, and 1 beep. This means that the memory is not detected or that the DIMM type is incorrect.

Beep code	Description	Recommended action
1-2	Video BIOS initialization error	If nothing is displayed, check if the connector of the display unit is properly connected.
1-2	Option ROM initialization error	If the error persists, contact your service representative to replace the base board. 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 base board or PCI board.
1-3-3-1	Memory is not detected. Or, DIMM type is incorrect.	Check if the DIMM and memory boards are properly connected. If the error persists, contact your service representative to replace one or several DIMMs or memory boards.
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	Processor fails to start.	Check if the processor is properly installed.
1-5-2-2	No processor error	If the error persists, contact your service representative to replace processor or base board.
1-5-2-3	Processors of various types and voltages coexist.	Check if the additionally installed processor is supported by the server. Check also the installation of processor. If the error persists, contact your service representative to replace the processor or base board.
2-2-3-1	Unexpected interrupt test error	Contact your service representative to replace the base board.

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**NOTE:** The SAS riser board emits a beep sound (one second or so) immediately after system power-on or reset, it is not an error.

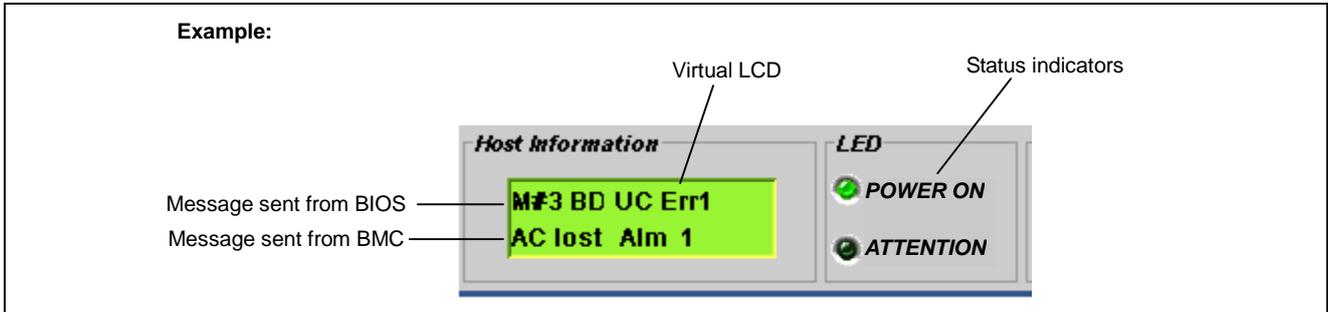
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## Error Messages on the Virtual LCD

On the Web browser of the EXPRESSSCOPE Engine 2 (BMC), you can view the error messages on a virtual LCD. The following table lists the error messages displayed on the upper and lower lines and actions to take.

On-screen error messages related to devices such as the processor, memory, and fans and their installation locations are associated as shown in the figure on pages 8-24 to 8-28.

Refer to the EXPRESSSCOPE Engine 2 User's Guide for more information on the virtual LCD.



### Messages displayed on the upper line (BIOS Message)

When the STATUS lamp lights green

On-screen message	Description	Action
Prepare To Boot	POST completes normally.	This is not an error.

When the STATUS lamp flashes green

On-screen message	Description
	Recommended action
CPU Reconfigured	The system started with a degraded processor.
	Try the following steps to cancel the error. Run the BIOS SETUP, select [Main] - [Processor Settings] - [Processor Retest]- [Yes], then select [Exit] - [Exit Saving Changes]. If the error persists, contact your service representative.
Mem Reconfigured	The system started with a degraded memory.
	Try the following steps to cancel the error. Run the BIOS SETUP, select [Advanced] - [Memory Configuration] - [Memory Retest]- [Yes], then select [Exit] - [Exit Saving Changes]. If the error persists, contact your service representative.
Mem(xx) D(y) Unc Err	A memory mirror failover occurred due to an uncorrectable error on a DIMM in the following location (in memory mirroring configuration). (xx): Memory board that contains the failed DIMM. AB: Memory board A or B CD: Memory board C or D (y): Slot number of the memory board that contains the failed DIMM.
	You may continue using the system, however, try the following steps. 1. Reboot (reset) the server. 2. Check the installation status of the failed DIMMs. 3. Replace the failed DIMMs. If the error persists, contact your service representative.
Mem(x) DIMM(y) C Err	A correctable error occurred on DIMM in the following location. (x): Memory board that contains the failed DIMM. A: Memory board A B: Memory board B C: Memory board C D: Memory board D (y): Slot number of the memory board that contains the failed DIMM.
	You may continue using the system, however, try the following steps. 1. Reboot (reset) the server. 2. Check the installation status of the failed DIMMs. 3. Replace the failed DIMMs. If the error persists, contact your service representative.
PCI Slot(x) C Err	A correctable error occurred on PCI card installed in PCI slot (x).
	You may continue using the system, however, try the following steps. 1. Reboot (reset) the server. 2. Check the installation status of the failed PCI card. 3. Replace the failed PCI card. If the error persists, contact your service representative.
PCIE C Err (x)	A correctable error occurred on the PCI Express bus.
	Reboot (reset) the server, though you may continue using the system. If the error persists, contact your service representative.
Chipset C Err (x)	A correctable error occurred on the chipset.
	Reboot (reset) the server, though you may continue using the system. If the error persists, contact your service representative.
FBD CH(x) C Err	A correctable error occurred on the memory board in the following location. (x): Memory board that contains the failed DIMM. A: Memory board A B: Memory board B C: Memory board C D: Memory board D
	You may continue using the system, however, try the following steps. 1. Reboot (reset) the server. 2. Check the installation status of the failed memory board. 3. Check the installation status of the DIMM on the failed memory board. If the error persists, contact your service representative.
Sparing FailOver	A memory mirror failover occurred due to an uncorrectable error on a DIMM (in memory sparing configuration).

On-screen message	Description
	Recommended action
	<p>You may continue using the system, however, try the following steps.</p> <ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Check the installation status of the failed DIMMs.</li> <li>3. Replace the failed DIMMs.</li> </ol> <p>If the error persists, contact your service representative.</p>
Mirror FailOver	A memory mirror failover occurred due to an uncorrectable error on a DIMM (in memory mirroring configuration).
Mirror B1 Fail	A memory mirror failover occurred due to an uncorrectable error on DIMMs on the memory board A or B (in memory mirroring configuration).
Mirror B2 Fail	<p>A memory mirror failover occurred due to an uncorrectable error on DIMMs on the memory board C or D (in memory mirroring configuration).</p> <p>You may continue using the system, however, try the following steps.</p> <ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Check the installation status of the failed DIMMs.</li> <li>3. Replace the failed DIMMs.</li> </ol> <p>If the error persists, contact your service representative.</p>
SB C Err (x)	<p>A correctable error occurred on the SAS riser board.</p> <p>You may continue using the system, however, try the following steps.</p> <ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Check the cable connection between the SAS riser board.</li> <li>3. Check the installation status of the SAS riser board.</li> </ol> <p>If the error persists, contact your service representative.</p>

When the STATUS lamp lights amber

On-screen message	Description Recommended action
Err Pause in POST	<p>The system is either waiting for a key entry due to a serious POST error or the POST was terminated forcibly because a serious POST error has occurred.</p> <ol style="list-style-type: none"> <li>1. See "POST Error Messages" described earlier to find the error contents and the actions to take regarding the displayed message.</li> <li>2. Reboot (reset) the server.</li> <li>3. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> </ol> <p>If the error persists, contact your service representative.</p>
Hang in POST	<p>The system hangs during POST.</p> <ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> </ol> <p>If the error persists, contact your service representative.</p>
BIOS Recovery run	<p>A fatal error occurred on the system BIOS ROM.</p> <ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> </ol> <p>If the error persists, contact your service representative.</p>
Mem(xx) D(y) Unc Err	<p>An uncorrectable error occurred on a DIMM in the following location.</p> <p>(xx): Memory board that contains the failed DIMM.            AB: Memory board A or B            CD: Memory board C or D</p> <p>(y): Slot number of the memory board that contains the failed DIMM.</p> <ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Check the installation status of the failed DIMM.</li> <li>3. Replace the failed DIMMs.</li> </ol> <p>If the error persists, contact your service representative.</p>
PCI Slot(x) Unc Err	<p>An uncorrectable error occurred on the PCI card installed in the PCI slot (x).</p> <ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> <li>3. Check the installation status of the failed PCI card.</li> <li>4. Replace the failed PCI card.</li> </ol> <p>If the error persists, contact your service representative.</p>
PCIE Unc Err(x)	<p>An uncorrectable error occurred on the PCI Express bus.</p> <ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> </ol> <p>If the error persists, contact your service representative.</p>
Chipset Unc Err(x)	<p>An uncorrectable error occurred on the chipset.</p> <ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> </ol> <p>If the error persists, contact your service representative.</p>
FBD CH(x) Unc Err	<p>An uncorrectable error occurred on a memory board in the following location.</p> <p>(x): Memory board that contains the failed DIMM.            1: Memory board A            2: Memory board B            3: Memory board C            4: Memory board D</p> <ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> <li>3. Check the installation status of the failed DIMMs.</li> <li>4. Replace the failed DIMMs.</li> </ol> <p>If the error persists, contact your service representative.</p>

On-screen message	Description
	Recommended action
FSB (x) Unc Err	An uncorrectable error occurred in the internal component of the processor (x) or in the external bus.
	<ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> </ol> If the error persists, contact your service representative.
I/O Unc Err (x)	An uncorrectable error occurred in the internal circuit of the I/O interface.
	<ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> </ol> If the error persists, contact your service representative.
SB Unc Err(x)	An uncorrectable error occurred in the SAS riser board.
	<ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> <li>3. Check the cable connection with the SAS riser board.</li> <li>4. Check the installation status of the SAS riser board.</li> </ol> If the error persists, contact your service representative.

## Messages displayed on the lower line (BMC Message)

When the STATUS lamp is off

On-screen message	Description
	Recommended action
SMI Timeout	A timeout error occurred during the system management interrupt. 1. Reboot (reset) the server. 2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server. If the error persists, contact your service representative.
DUMP Request!	The DUMP switch was pressed. Wait until the OS dump process completes. If the dump process is not completed, take one of the following steps. 1. Reboot (reset) the server. 2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server. If the error persists, contact your service representative.
Proc1 Thermal Trip	A forced power-off occurred due to a thermal error in processor #1.
Proc2 Thermal Trip	A forced power-off occurred due to a thermal error in processor #2.
Proc3 Thermal Trip	A forced power-off occurred due to a thermal error in processor #3.
Proc4 Thermal Trip	A forced power-off occurred due to a thermal error in processor #4. 1. Reboot (reset) the server. 2. Check if the fans in the server work normally. 3. Check the installation status of failed processor. 4. Replace the failed processor. If the error persists, contact your service representative.
Proc1 IERR	An internal error (IERR) was detected in processor #1.
Proc2 IERR	An internal error (IERR) was detected in processor #2.
Proc3 IERR	An internal error (IERR) was detected in processor #3.
Proc4 IERR	An internal error (IERR) was detected in processor #4. 1. Reboot (reset) the server. 2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server. 3. Check installation status of the failed processor. 4. Replace the failed processor. If the error persists, contact your service representative.
Proc1 Config Err	The processor installed in the processor #1 slot is unsupported, has failed, or its combination is illegal.
Proc2 Config Err	The processor installed in the processor #2 slot is unsupported, has failed, or its combination is illegal.
Proc3 Config Err	The processor installed in the processor #3 slot is unsupported, has failed, or its combination is illegal.
Proc4 Config Err	The processor installed in the processor #4 slot is unsupported, has failed, or its combination is illegal. 1. Reboot (reset) the server. 2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server. 3. Check the installation status of the failed processor. 4. Replace the failed processor. If the error persists, contact your service representative.
Proc1 Didn't Start	Failed to start processor #1.
Proc2 Didn't Start	Failed to start processor #2.
Proc3 Didn't Start	Failed to start processor #3.
Proc4 Didn't Start	Failed to start processor #4.

On-screen message	Description
	Recommended action
	<ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> <li>3. Check the installation status of the failed processor.</li> <li>4. Replace the failed processor.</li> </ol> <p>If the error persists, contact your service representative.</p>
WDT Power Down	<p>The system was forcibly shutdown due to a watchdog timer timeout error.</p> <p>Power on the server.</p> <p>If the error persists, contact your service representative.</p>
WDT Power Cycle	<p>The system was rebooted due to a watchdog timer timeout error.</p> <ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> </ol> <p>If the error persists, contact your service representative.</p>
WDT Timeout	<p>A watchdog timer timeout error occurred.</p> <ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> </ol> <p>If the error persists, contact your service representative.</p>

When the STATUS lamp lights amber

On-screen message	Description
	Recommended action
Proc Missing	No processor is installed.
	1. Check the installation status of processor. 2. Replace the processor. If the error persists, contact your service representative.
Unexpected Pw Lost	A power failure occurred.
	Contact your service representative.
Power On Ctrl Fault	A power failure occurred.
	Contact your service representative.
Mem A Power Fault	An error was detected in the power circuit of memory board A.
Mem B Power Fault	An error was detected in the power circuit of memory board B.
Mem C Power Fault	An error was detected in the power circuit of memory board C.
Mem D Power Fault	An error was detected in the power circuit of memory board D.
	1. Reboot (reset) the server. 2. Check the installation status of the failed memory board. 3. Replace the failed memory board. If the error persists, contact your service representative.
BB Power Fault	An error was detected in the power circuit of the base board.
	Reboot (reset) the server. If the error persists, contact your service representative.
SASR Power Fault	An error was detected in the power circuit of the SAS riser board.
	1. Reboot (reset) the server. 2. Check the installation status of the SAS riser board. If the error persists, contact your service representative.
Proc1 Power Fault	An error was detected in the power circuit for processor #1.
Proc2 Power Fault	An error was detected in the power circuit for processor #2.
Proc3 Power Fault	An error was detected in the power circuit for processor #3.
Proc4 Power Fault	An error was detected in the power circuit for processor #4.
	1. Reboot (reset) the server. 2. Check the installation status of the failed processor. If the error persists, contact your service representative.
BB +1.0V Alm 09	+1.0V voltage alarm (upper limit) occurred.
BB +1.0V Alm 02	+1.0V voltage alarm (lower limit) occurred.
BB +1.5V Alm 09	+1.5V voltage alarm (upper limit) occurred.
BB +1.5V Alm 02	+1.5V voltage alarm (lower limit) occurred.
BB +3.3V Alm 09	+3.3V voltage alarm (upper limit) occurred.
BB +3.3V Alm 02	+3.3V voltage alarm (lower limit) occurred.
BB +5V Alm 09	+5V voltage alarm (upper limit) occurred.
BB +5V Alm 02	+5V voltage alarm (lower limit) occurred.
BB +12V Alm 09	+12V voltage alarm (upper limit) occurred.
BB +12V Alm 02	+12V voltage alarm (lower limit) occurred.
BB FSB_VTT Alm 09	FSB VTT voltage alarm (upper limit) occurred.
BB FSB_VTT Alm 02	FSB VTT voltage alarm (lower limit) occurred.
BB +1.5V ESB Alm 09	+1.5V ESB voltage alarm (upper limit) occurred.
BB +1.5V ESB Alm 02	+1.5V ESB voltage alarm (lower limit) occurred.
BB +3.3V AUX Alm 09	+3.3V AUX voltage alarm (upper limit) occurred.
BB +3.3V AUX Alm 02	+3.3V AUX voltage alarm (lower limit) occurred.
BB +3.3Vs Alm 09	+3.3Vs voltage alarm (upper limit) occurred.
BB +3.3Vs Alm 02	+3.3Vs voltage alarm (lower limit) occurred.
	1. Reboot (reset) the server. 2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server. If the error persists, contact your service representative.
IO +3.3V AUX Alm 09	+3.3V AUX voltage alarm (upper limit) occurred on I/O riser board.
IO +3.3V AUX Alm 02	+3.3V AUX voltage alarm (lower limit) occurred on I/O riser board.
IO +1.8Vs Alm 09	+1.8Vs voltage alarm (upper limit) occurred on I/O riser board.
IO +1.8Vs Alm 02	+1.8Vs voltage alarm (lower limit) occurred on I/O riser board.

On-screen message	Description
	Recommended action
IO +1.2Vs Alm 09	+1.2Vs voltage alarm (upper limit) occurred on I/O riser board.
IO +1.2Vs Alm 02	+1.2Vs voltage alarm (lower limit) occurred on I/O riser board.
IO +1.0Vs Alm 09	+1.0Vs voltage alarm (upper limit) occurred on I/O riser board.
IO +1.0Vs Alm 02	+1.0Vs voltage alarm (lower limit) occurred on I/O riser board.
IO +12V Alm 09	+12V voltage alarm (upper limit) occurred on I/O riser board.
IO +12V Alm 02	+12V voltage alarm (lower limit) occurred on I/O riser board.
IO +5V Alm 09	+5V voltage alarm (upper limit) occurred on I/O riser board.
IO +5V Alm 02	+5V voltage alarm (lower limit) occurred on I/O riser board.
IO +3.3V Alm 09	+3.3V voltage alarm (upper limit) occurred on I/O riser board.
IO +3.3V Alm 02	+3.3V voltage alarm (lower limit) occurred on I/O riser board.
IO +1.5V Alm 09	+1.5V voltage alarm (upper limit) occurred on I/O riser board.
IO +1.5V Alm 02	+1.5V voltage alarm (lower limit) occurred on I/O riser board.
IO +1.0V Alm 09	+1.0V voltage alarm (upper limit) occurred on I/O riser board.
IO +1.0V Alm 02	+1.0V voltage alarm (lower limit) occurred on I/O riser board. <ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> <li>3. Check the installation status of the I/O riser board.</li> </ol> If the error persists, contact your service representative.
Battery Alm 09	A voltage alarm (upper limit) occurred on the lithium battery.
Battery Alm 02	A voltage alarm (lower limit) occurred on the lithium battery. <ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> <li>3. Check installation status of the lithium battery mounted on base board.</li> </ol> If the error persists, contact your service representative.
FP Temp Alm 09	A high temperature alarm occurred in the front panel.
FP Temp Alm 02	A low temperature alarm occurred in the front panel.
BB Temp Alm 09	A high temperature alarm occurred in the base board.
BB Temp Alm 02	A low temperature alarm occurred in the base board. Check if the fans in the server work normally. If the error persists, contact your service representative.
SASBP Temp C Alm	A temperature alarm occurred in the SAS riser board.
Mem A Temp Alm 09	A high temperature alarm occurred in memory board A.
Mem A Temp Alm 02	A low temperature alarm occurred in memory board A.
Mem B Temp Alm 09	A high temperature alarm occurred in memory board B.
Mem B Temp Alm 02	A low temperature alarm occurred in memory board B.
Mem C Temp Alm 09	A high temperature alarm occurred in memory board C.
Mem C Temp Alm 02	A low temperature alarm occurred in memory board C.
Mem D Temp Alm 09	A high temperature alarm occurred in memory board D.
Mem D Temp Alm 02	A low temperature alarm occurred in memory board D. <ol style="list-style-type: none"> <li>1. Check if the fans in the server work normally.</li> <li>2. Check the installation status of the failed memory board.</li> </ol> If the error persists, contact your service representative.
PS1 Temp Alm 09	A high temperature alarm occurred in the power supply unit #1.
PS1 Temp Alm 02	A low temperature alarm occurred in the power supply unit #1.
PS2 Temp Alm 09	A high temperature alarm occurred in the power supply unit #2.
PS2 Temp Alm 02	A low temperature alarm occurred in the power supply unit #2. <ol style="list-style-type: none"> <li>1. Check if the fans in the power supply unit work normally.</li> <li>2. Check if the fans in the server work normally.</li> <li>3. Check the installation status of the failed power supply unit.</li> </ol> If the error persists, contact your service representative.
Proc1 Therm % 09	A high temperature alarm occurred in processor #1.
Proc1 Therm % 02	A low temperature alarm occurred in processor #1.
Proc2 Therm % 09	A high temperature alarm occurred in processor #2.
Proc2 Therm % 02	A low temperature alarm occurred in processor #2.
Proc3 Therm % 09	A high temperature alarm occurred in processor #3.

On-screen message	Description
	Recommended action
Proc3 Therm % 02	A low temperature alarm occurred in processor #3.
Proc4 Therm % 09	A high temperature alarm occurred in processor #4.
Proc4 Therm % 02	A low temperature alarm occurred in processor #4.
	<ol style="list-style-type: none"> <li>1. Check if the fans in the server work normally.</li> <li>2. Check the installation status of the failed processor and the processor heat sink.</li> </ol> <p>If the error persists, contact your service representative.</p>
AC lost Alm 1	The power supply unit #1 failed to supply AC power.
AC lost Alm 2	The power supply unit #2 failed to supply AC power.
	<ol style="list-style-type: none"> <li>1. Check the connection status of the AC power cord of the failed power supply unit.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> </ol> <p>If the error persists, contact your service representative.</p>

When the STATUS lamp flashes amber

On-screen message	Description
	Recommended action
HDD Fault	An error was detected in the hard disk drive. <ol style="list-style-type: none"> <li>1. Check installation status of the failed hard disk drive.</li> <li>2. If the hard disk drives are in RAID configuration (RAID1, RAID5, RAID6, RAID10, or RAID50), a single failed hard disk drive does not affect the operation of the server. However, we recommend you replace the failed hard disk drive and rebuild the hard disk drives as soon as possible.</li> <li>3. If the error persists, contact your service representative.</li> </ol>
FAN1 Alarm	A warning occurred in FAN #1.
FAN2 Alarm	A warning occurred in FAN #2.
FAN3 Alarm	A warning occurred in FAN #3.
FAN4 Alarm	A warning occurred in FAN #4.
FAN5 Alarm	A warning occurred in FAN #5.
FAN6 Alarm	A warning occurred in FAN #6.
FAN7 Alarm	A warning occurred in FAN #7.
FAN8 Alarm	A warning occurred in FAN #8. Check the installation status of the failed fan. If the error persists, contact your service representative.
BB +1.0V Alm 07	+1.0V voltage warning (upper limit) occurred.
BB +1.0V Alm 00	+1.0V voltage warning (lower limit) occurred.
BB +1.5V Alm 07	+1.5V voltage warning (upper limit) occurred.
BB +1.5V Alm 00	+1.5V voltage warning (lower limit) occurred.
BB +3.3V Alm 07	+3.3V voltage warning (upper limit) occurred.
BB +3.3V Alm 00	+3.3V voltage warning (lower limit) occurred.
BB +5V Alm 07	+5V voltage warning (upper limit) occurred.
BB +5V Alm 00	+5V voltage warning (lower limit) occurred.
BB +12V Alm 07	+12V voltage warning (upper limit) occurred.
BB +12V Alm 00	+12V voltage warning (lower limit) occurred.
BB FSB_VTT Alm 07	FSB VTT voltage warning (upper limit) occurred.
BB FSB_VTT Alm 00	FSB VTT voltage warning (lower limit) occurred.
BB +1.5V ESB Alm 07	+1.5V ESB voltage warning (upper limit) occurred.
BB +1.5V ESB Alm 00	+1.5V ESB voltage warning (lower limit) occurred.
BB +3.3V AUX Alm 07	+3.3V AUX voltage warning (upper limit) occurred.
BB +3.3V AUX Alm 00	+3.3V AUX voltage warning (lower limit) occurred.
BB +3.3Vs Alm 07	+3.3Vs voltage warning (upper limit) occurred.
BB +3.3Vs Alm 00	+3.3Vs voltage warning (lower limit) occurred. <ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> </ol> If the error persists, contact your service representative.
IO +3.3V AUX Alm 07	+3.3V AUX voltage warning (upper limit) occurred in the I/O riser board.
IO +3.3V AUX Alm 00	+3.3V AUX voltage warning (lower limit) occurred in the I/O riser board.
IO +1.8Vs Alm 07	+1.8Vs voltage warning (upper limit) occurred in the I/O riser board.
IO +1.8Vs Alm 00	+1.8Vs voltage warning (lower limit) occurred in the I/O riser board.
IO +1.2Vs Alm 07	+1.2Vs voltage warning (upper limit) occurred in the I/O riser board.
IO +1.2Vs Alm 00	+1.2Vs voltage warning (lower limit) occurred in the I/O riser board.
IO +1.0Vs Alm 07	+1.0Vs voltage warning (upper limit) occurred in the I/O riser board.
IO +1.0Vs Alm 00	+1.0Vs voltage warning (lower limit) occurred in the I/O riser board.
IO +12V Alm 07	+12V voltage warning (upper limit) occurred in the I/O riser board.
IO +12V Alm 00	+12V voltage warning (lower limit) occurred in the I/O riser board.
IO +5V Alm 07	+5V voltage warning (upper limit) occurred in the I/O riser board.
IO +5V Alm 00	+5V voltage warning (lower limit) occurred in the I/O riser board.
IO +3.3V Alm 07	+3.3V voltage warning (upper limit) occurred in the I/O riser board.
IO +3.3V Alm 00	+3.3V voltage warning (lower limit) occurred in the I/O riser board.
IO +1.5V Alm 07	+1.5V voltage warning (upper limit) occurred in the I/O riser board.
IO +1.5V Alm 00	+1.5V voltage warning (lower limit) occurred in the I/O riser board.

On-screen message	Description
	Recommended action
IO +1.0V Alm 07	+1.0V voltage warning (upper limit) occurred in the I/O riser board.
IO +1.0V Alm 00	+1.0V voltage warning (lower limit) occurred in the I/O riser board. <ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> <li>3. Check the installation status of the I/O riser board.</li> </ol> If the error persists, contact your service representative.
Battery Alm 07	Voltage warning (upper limit) occurred on lithium battery.
Battery Alm 00	Voltage warning (lower limit) occurred on lithium battery. <ol style="list-style-type: none"> <li>1. Reboot (reset) the server.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> <li>3. Check the installation status of the lithium battery on the base board.</li> </ol> If the error persists, contact your service representative.
FP Temp Alm 07	A high temperature warning occurred in the front panel.
FP Temp Alm 00	A low temperature warning occurred in the front panel.
BB Temp Alm 07	A high temperature warning occurred in the base board.
BB Temp Alm 00	A low temperature warning occurred in the base board. Check if the fans in the server are working normally. If the error persists, contact your service representative.
SASBP Temp NCAIm	A temperature warning occurred in the SAS riser board.
Mem A Temp Alm 07	A high temperature warning occurred in the memory board A.
Mem A Temp Alm 00	A low temperature warning occurred in the memory board A.
Mem B Temp Alm 07	A high temperature warning occurred in the memory board B.
Mem B Temp Alm 00	A low temperature warning occurred in the memory board B.
Mem C Temp Alm 07	A high temperature warning occurred in the memory board C.
Mem C Temp Alm 00	A low temperature warning occurred in the memory board C.
Mem D Temp Alm 07	A high temperature warning occurred in the memory board D.
Mem D Temp Alm 00	A low temperature warning occurred in the memory board D. <ol style="list-style-type: none"> <li>1. Check if the fans in the server work normally.</li> <li>2. Check installation status of the failed memory board.</li> </ol> If the error persists, contact your service representative.
PS1 Temp Alm 07	A high temperature warning occurred in the power supply unit #1.
PS1 Temp Alm 00	A low temperature warning occurred in the power supply unit #1.
PS2 Temp Alm 07	A high temperature warning occurred in the power supply unit #2.
PS2 Temp Alm 00	A low temperature warning occurred in the power supply unit #2. <ol style="list-style-type: none"> <li>1. Check if the fans in the power supply unit work normally.</li> <li>2. Check if the fans in the server work normally.</li> <li>3. Check the installation status of the failed power supply unit.</li> </ol> If the error persists, contact your service representative.
Proc1 Therm % 07	A high temperature warning occurred in processor #1.
Proc1 Therm % 00	A low temperature warning occurred in processor #1.
Proc2 Therm % 07	A high temperature warning occurred in processor #2.
Proc2 Therm % 00	A low temperature warning occurred in processor #2.
Proc3 Therm % 07	A high temperature warning occurred in processor #3.
Proc3 Therm % 00	A low temperature warning occurred in processor #3.
Proc4 Therm % 07	A high temperature warning occurred in processor #4.
Proc4 Therm % 00	A low temperature warning occurred in processor #4. <ol style="list-style-type: none"> <li>1. Check if the fans in the server work normally.</li> <li>2. Check the installation status of the failed processor and heat sink.</li> </ol> If the error persists, contact your service representative.
Power Unit Alm 1	An error occurred in the power supply unit #1.
Power Unit Alm 2	An error occurred in the power supply unit #2. <ol style="list-style-type: none"> <li>1. Check the connection status of the AC power cord of the failed power supply unit.</li> <li>2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server.</li> </ol> If the error persists, contact your service representative.

<b>On-screen message</b>	<b>Description</b>
	<b>Recommended action</b>
Predictive Alm 1	A warning occurred in the power supply unit #1.
Predictive Alm 2	A warning occurred in the power supply unit #2. 1. Check the connection status of the AC power cord of the failed power supply unit. 2. Turn off the DC power of the server, and disconnect the AC power cord. Connect the AC power cord again, and reboot the server. If the error persists, 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 provided instructions before asking for repair.

If the server still fails to operate successfully, note the on-screen messages and contact your service representative.

---

### Problems with the Server

#### No screen display appears with beep:

Are the DIMMs installed securely?

- Check whether the DIMMs are connected firmly to their mating connectors.
- Check whether DIMMs of different specifications are installed in the specific group. See Chapter 9 for the correct DIMMs specifications.
- The SAS riser board emits a beep sound for one second or so immediately after system power-on or reset, it is not an error.

#### Fail to power on the server:

- Is the server properly supplied with power?

- Check if the power cord is connected to a power outlet (or UPS) that meets the power specifications for the server.
- Make sure to use the power cord provided with the server.
- Check the power cord for a broken shield or bent plugs.
- Make sure that the power breaker for the connected power outlet is on.
- If the power cord is plugged to a UPS, make sure the UPS is powered on and that it outputs power. See the manual that comes with the UPS for details.

Power supply to the server must 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/SLEEP switch?

- Press the POWER/SLEEP switch on the front of the server to power on (the POWER/SLEEP LED lights).

#### Fail to power off the server / POWER/SLEEP switch is disabled:

Is the POWER/SLEEP switch enabled?

- Restart the server and start the BIOS setup utility.

<Menu to check: [Security] - [Power Switch Inhibit]>

#### POST fails to complete:

Is the DIMM board installed?

- At least two DIMM boards are required for operation.

Is the memory size large?

- The memory check may take a few minutes 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, the POST may accidentally detect a keyboard controller error and stop proceeding. In such a case, restart the server. Do not perform any keyboard or mouse operation until the BIOS start-up message appears when you restart the server.

Does the server contains appropriate memory boards or PCI devices?

→ Operation of the server with unauthorized devices is not guaranteed.

#### **The keyboard or mouse fails to function:**

Is the cable properly connected?

→ Make sure that the cable is connected to the correct connector on the rear of the server.

→ The keyboard or mouse will not function if it is connected when the server is powered on (not applicable to USB devices). Power off the server first and connect it properly.

Are the server drivers installed?

→ Refer to the manual that comes with your OS to check that the keyboard and mouse drivers are installed. (These drivers are installed along with the OS.) Some operating systems allow you to change the keyboard and mouse settings. Refer to the manual that comes with your OS to check that the keyboard and mouse settings are correct.

#### **Fail to access (read or write) to the floppy disk:**

Does the floppy disk drive contain a floppy disk?

→ Insert a floppy disk into the floppy disk drive until it clicks.

Is the floppy disk write-protected?

→ Place the write-protect switch on the floppy disk to the "Write-enabled" position.

Is the floppy disk formatted?

→ Use a formatted floppy disk or format the floppy disk in the floppy disk drive. Refer to the manual that comes with the OS for more information on this process.

Is BIOS configuration correct?

→ The USB device may be disabled in the BIOS setup utility of the server. Check the setting using the BIOS setup utility.

<Menus to check:-[Advanced] - [I/O Device Configuration] - [Legacy USB Support]>

#### **Fail to access the optical disc:**

Is the optical disc properly set in the optical disc drive tray?

→ The tray is provided with a holder to secure the optical disc. Make sure that the optical disc is placed properly in the holder.

Is the optical disc applicable to the server?

→ Macintosh optical discs cannot be read.

**Fail to access to the CD-R disk:**

Is the disc correctly inserted?

→ Take out the CD-R disk from the tray, and then set it again with its labeled surface upward.

Is there any soil or crack on CD-R disk?

→ Make sure that the disk surface is not soiled. Also make sure that there is no crack on the disk surface. Clean the disk surface if necessary.

If the disc still cannot be read, set another disc from which data has been successfully read to check if the drive can read the disk.

Is the CD-R disk closed?

→ Close the session or set the disk in closed status, and try to read again.

Are the CD-R disk and writing software appropriate to the disk drive?

→ The optical disc drive of the server may fail if the combination of disk drive, writing software, and CD-R is not correct.

**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 the manufacturer 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 fully inserted (see Chapter 9).

**Fail to access the (internal or external) SCSI devices:**

Is the SCSI device applicable to the server?

→ Operation of any SCSI device that is not authorized by the manufacturer is not guaranteed.

Are the SCSI devices properly configured?

→ When external SCSI devices are connected to the server, device 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 the optional controllers) properly configured?

→ If an optional SCSI controller is installed in the server, and if SCSI devices connected to it, use the BIOS setup utility that comes with the optional SCSI controller for proper configuration. Refer to the manual that comes with the optional SCSI controller for details.

**Fail to access the internal or external devices (or such devices fail to operate):**

Are the cables properly connected?

→ Make sure that the interface cables and power cord are properly connected. Also make sure that the cables were connected in the correct order.

Is the power-on order correct?

→ When external devices are connected to the server, power on the external devices first, then the server.

Did you install drivers for the connected optional devices?

→ Some optional devices require specific device drivers. Refer to the manual that comes with the device to install its driver.

Is the BIOS configuration correct?

→ When PCI devices are connected to the server, make sure to set the PCI device interrupt 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 in order to make the correct settings.

<Menus to check: [Advanced] - [Advanced Chipset Control] - [PCI Device]>

→ Some devices connected to the serial port may require an I/O port address or operation mode settings. Refer to the manual that comes with the board for details in order to make correct settings.

<Menu to check: [Advanced] - [Peripheral Configuration]>

**After a PCI device was additionally installed, the system became to operate incorrectly.**

Is the board installed correctly?

Reinstall the board correctly referring to Chapter 9.

Is "Disabled" specified in the [Option ROM] for the slot in which to install the board (excluding the board used for the OS boot)?

→ Check the settings with the BIOS SETUP utility.

<Menus to check: [Advanced] - [PCI Configuration] - [PCI Slot n] (n: PCI slot number of installed board) - [Option ROM Scan]>

Is "Disabled" specified in [Option ROM] for the slot for the added network board which is not used for network boot?

→ Check the settings with the BIOS SETUP utility.

<Menus to check: [Advanced] - [PCI Configuration] - [PCI Slot n] (n: PCI slot number of installed board) - [Option ROM Scan]>

**Fail to start the OS:**

Is there a floppy disk in the floppy disk drive?

→ Take out the floppy disk and restart the server.

Is the EXPRESSBUILDER DVD in the optical disc drive?

→ Take out the EXPRESSBUILDER DVD and restart the server.

Is the OS broken?

→ Use the recovery process to recover the system.

**Inserted the correct CD-ROM but the message below is displayed:**

The CD-ROM is not inserted or the wrong CD-ROM is inserted.  
Please insert the correct CD-ROM.

OK

Is the data side of the CD-ROM dirty or damaged?

→ Take the CD-ROM out of the optical disc drive, confirm that it is not dirty or damaged, set the disc again and click [OK].

**After changing the transfer rate of the giga driver from 1000Mbps to 100Mbps, the DataViewer of NEC ESMPRO shows a wrong value (1000Mbps is still displayed):**

→ The indication may be wrong but it does not affect the operation of LAN driver.

The server cannot be 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 which is used conforms to the network interface standard.

Is the BIOS configuration correct?

→ The onboard 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] - [Embedded NIC 1], [Embedded NIC 2]>

Have the protocol and service already been 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 the Control Panel to specify a "Link Speed & Duplex" value identical to the value specified for the HUB.

#### **PCI hot-plug fails:**

Is the BIOS configuration correct?

→ You must change the BIOS configuration to use the PCI hot-plug feature.

<Menus to check: [Advanced] - [PCI Configuration] - [Hot Plug PCI Control] - [Minimum/Middle/Maximum\*]>

\* The settings depend on the board to be installed. See Chapter 4 for details.

#### **The driver of a PCI board cannot be stopped from the OS when Hot Remove or Hot Replace is executed for the PCI board:**

Is there another software using the PCI board for which Hot Remove or Hot Replace is to be executed?

→ If another software is using the PCI board for which Hot Remove or Hot Replace is to be executed, the driver of the PCI board cannot be stopped.

Terminate the software, then stop the driver of the PCI board. If executing a Hot Replace, restart the software after having mounted a new PCI board.

### The Management PC cannot detect the server:

Is the LAN cable properly connected?

→ Make sure that the cable is properly connected to the management LAN port. If the cables are incorrectly connected, the sensor of the server will not be monitored. Also check that no cables were connected to the LAN connector by mistake.

Is the IP address unique in the network?

→ The IP address for management LAN port is factory-set to 192.168.1.1. If the same address exists in the same network, the server will not be detected correctly. Change the IP address appropriately.

Is the server set to be monitored by the NEC ESMPRO Agent?

→ Change the NEC ESMPRO Agent settings.

Start the NEC ESMPRO Agent from the Windows control panel, select [System] → [Express5800 Server] → [Monitor]. (The default is [Does not monitor].) The monitoring starts automatically. You need not to restart the system, however, it may be necessary to reconfigure the tree if the server is not detected.

Is the connection suppressed by the firewall or gateway settings?

→ The connection may have been restricted by the firewall or gateway settings. Use the LAN cross cable to connect to the client PC and try again. If the problem is resolved, confirm the firewall and gateway settings according to the "Remote Management Function" - "Network Configuration" in Chapter 4.

### Forgotten the login name/password to use the remote management feature through the Web browser:

→ If you have forgotten the login name or password, restore the factory defaults, including the password by changing the BMC configuration jumper switch.

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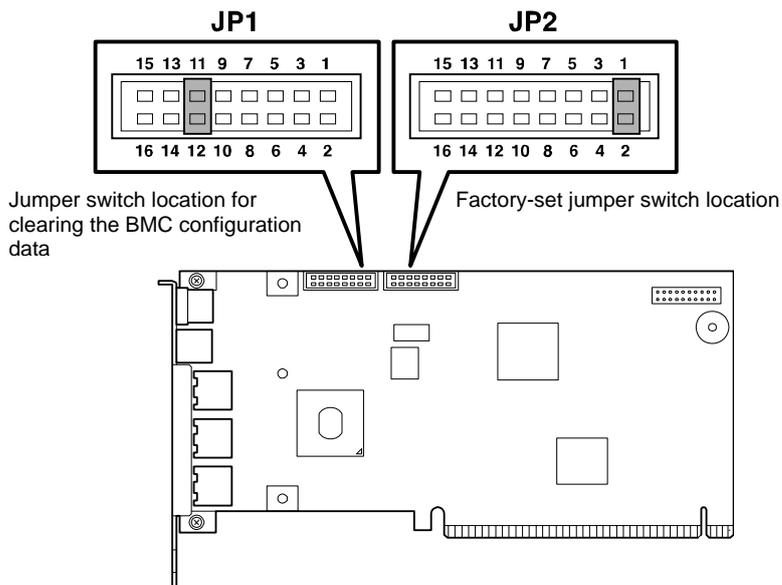
**IMPORTANT:** Restoring the factory default clears the BMC configuration that is used for NEC DianaScope to connect with the server.

If you are using NEC DianaScope, you need to save the configuration data into the floppy disk before clearing the password.

BMC can be configured and saved with the NEC DianaScope Agent and the system management feature of EXPRESSBUILDER.

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1. Power off the server and unplug the power cord.
2. Change the jumper switch settings on the I/O riser board as shown below. (See I/O Riser Board in Chapter 2 for details.)



3. Connect the power cord.
4. Wait at least 30 seconds (without powering on the server), and unplug the power cord.
5. Restore the BMC configuration jumper switch settings and power on the server for reconfiguration.

#### Event logs when using the Intel Network adapter teaming

Event Type: Warning  
 Event Source: IANSMiniport  
 Event Category: None  
 Event ID: 11  
 Description: Adapter link down: Intel(R)PRO/1000 ----

Event Type: Warning  
 Event Source: IANSMiniport  
 Event Category: None  
 Event ID: 13  
 Description: Intel(R)PRO/1000 ---- has been deactivated from the team.

Event Type: Error  
 Event Source: IANSMiniport  
 Event Category: None  
 Event ID: 16  
 Description: Team #0: The last adapter has lost link.  
 Team network connection has been lost.

Event Type: Warning  
 Event Source: IANSMiniport  
 Event Category: None  
 Event ID: 22  
 Description: Primary Adapter does not sense any Probes:  
 Intel(R)PRO/1000 ---- Possible reason: partitioned Team.

The above-mentioned event log will appear when the system starts. There is no problem in LAN driver operation.

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## Problems with Windows

**In some cases 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 for system operation.

**In some cases 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.

→ Reboot the system. If this event is not registered again, it is not a problem for system operation.

**In some cases 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.

→ The above event log will be registered if you use "Hardware Management" which is provided by Windows Server 2003 R2.

**The operating system cannot be installed correctly.**

Did you check the notes on the operating system installation?

→ See Chapter 6.

**The OS presents unstable operation:**

Did you update the system?

→ Installing a network drive after the OS installation may cause unstable operation. Use the EXPRESSBUILDER DVD to update the system. (See Chapter 6.)

**When a trouble occurred, the system does not restart automatically as it should.**

→ If some troubles occurred on Windows 2003, the system may not restart automatically even if "Restart automatically" is specified. In such a case, restart the system manually.

**Cannot turn the power OFF during a blue screen occurrence:**

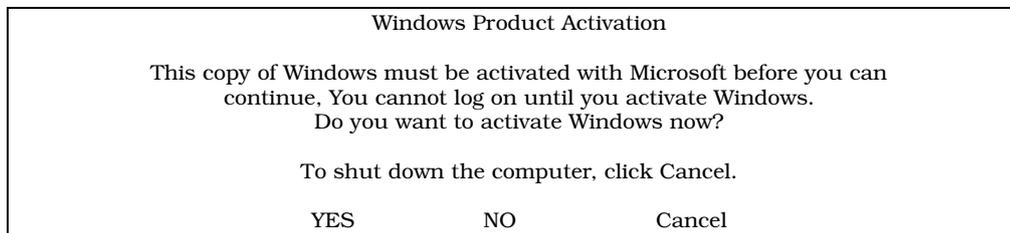
→ If you want to turn off the power during a blue screen, execute a forced power off (forced shut down: continue to press POWER/SLEEP switch for 4 seconds). The power will not be turned off if you press the switch just one time.

**The processor name displayed in [General] tab of [System Property] is not in the correct position.**

→ There is no problem for operation.

**The system displays the message below and fails to log in.**

→ In Windows Server 2003, the following message will be displayed if you use the operating system without executing the license authentication. Select "Yes", and execute the procedure for license authentication.



**About the System Log when re-starting the system on Windows Server 2003**

Type: Warning  
Source: E100B  
Event ID: 4  
Description: Adapter Intel(R) PRO/100 Network Connection: Adapter Link Down

→ When re-starting the system without connecting the network cable, this log may be found in system event log, but it has no effect on the behavior of LAN driver. Confirm that the system is properly connected with the LAN cable. If the 100Base LAN port is not used, disable the 100Base LAN on the device manager or disable it on the BIOS configuration. Thus, the log will not be registered.

### Event logs in using SNMP Service in Windows Server 2003

Event Type: Warning  
Event Source: EvntAgnt  
Event Category: None  
Event ID: 1015  
Description: TraceLevel parameter not located in registry;  
Default trace level used is 32.

Event Type: Warning  
Event Source: EvntAgnt  
Event Category: None  
Event ID: 1003  
Description: TraceFileName parameter not located in registry;  
Default trace file used is XX.

→ The system will not be affected by these event logs. SNMP will not be affected either, so these logs can be ignored.

### The Telnet Service is not installed.

→ Adjust the computer name to 14 characters or less, and then install the Telnet Service according to <How to install the Telnet Service>.

<How to install the Telnet Service>

1. Click [Run] on Start menu.
2. Type "tlntsvr /service" in the [Open] box, and click [OK].
3. Click the Start menu, point to [Control Panel], click [Computer Management] and then click [Services] to specify whether the Telnet Service is registered.

\* Once the installation of Telnet Service is finished, the computer name can be set to 15 characters or more.

## Problems with EXPRESSBUILDER

When the server does not boot from the EXPRESSBUILDER DVD, check the following:

Did you set the EXPRESSBUILDER during POST and restart the server?

→ If you do not set the EXPRESSBUILDER during POST and restart the server, either 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 disc drive first.

<Menu to check: [Boot]>

Has an error message appeared?

→ When an error occurs while the EXPRESSBUILDER is in progress, the following message appears.

After this message appears, check the error and take the appropriate corrective action according to the message listed in the table below.

Message	Cause and Remedy
This machine is not supported.	This EXPRESSBUILDER version is not designed for this server. Execute the EXPRESSBUILDER on the compliant server.

If [OS installation \*\*\*default\*\*\*] is selected at the BOOT Selection screen, the 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 EXPRESSBUILDER version is not designed for this server. Execute the 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 the EXPRESSBUILDER could not find system-specific information because of a motherboard 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.	

---

## Problems with Express Setup

The following message appeared when you tried to install Express Setup to a hard disk drive that has a smaller capacity than the specified partition size:

The creating of the partition was failed.  
The process can not be continued. The process was stopped.

OK

- Cannot continue the setup.  
Specify a smaller partition size than the capacity of the connected hard disk drive, and then retry the setup.

**The Express Setup terminated and asks to input setup information.**

- There are some errors on the specified setup information.  
Follow the instructions to input a correct value. It is not necessary to cancel the installation.

**The created system partition is of a smaller size than the specified value.**

- With ExpressSetup, in some cases the size of the created system partition is about 8MB smaller than the specified size.  
It is not a problem for system operation.

**Specified to join the Domain, but the system is installed as Workgroup.**

- When the setup fails to join the Domain during the installation, it will install the system as a Workgroup.  
Open [System] in Control Panel to specify joining the Domain.

**Changed the giga driver speed from 1000M bps to 100M bps. But the changed speed is not properly displayed in Network Details of NEC ESMPRO DataViewer (still 1000M bps is indicated):**

- It does not affect the operation of the LAN driver.

---

## Error Message during RAID System Configuration

If the server configured with a RAID System does not work correctly or if the utility program fails, check the following and take an appropriate action.

### The OS cannot be installed:

- Is the RAID Controller correctly configured?
  - Perform the configuration properly using WebBIOS.

### The OS cannot be started:

- Has the BIOS setting for the RAID Controller changed?
  - Set it properly.
- Does the POST recognize the RAID Controller?
  - Check that the RAID Controller is connected correctly and then turn the power ON.
  - When the RAID System is connected correctly but is not recognized, it may be faulty. Contact your service representative or the dealer that you purchased this controller from.

### Rebuilding cannot be performed:

- Is the capacity of the hard disk drive to be used for the rebuild rebuilt insufficient?
  - Use a hard disk drive of the same capacity as the faulty one.
- Is the Logical Drive configuration RAID0?
  - RAID0 does not have redundancy thus rebuilding cannot be performed. Replace the "DEAD" hard disk drive, create the configuration information again, perform the initialization and then restore using the backup data.

### Auto-rebuild cannot be performed:

- Did you wait at least 60 seconds during the drives hot-swap?
  - Wait at least 60 seconds between the removal of the failed disk and the insertion of the new one.
- Is the BIOS setting for the RAID Controller correct?
  - Check the BIOS setting for the RAID Controller.

### A hard disk drive goes into the "FAIL" status:

- Contact your service representative or the dealer that you purchased it from.

### The Consistency Check cannot be performed:

- Is the virtual disk indicated as "Degraded"?
  - Replace the failed hard disk drive and execute a rebuild process.
- Is the RAID level of the virtual disk "RAID0"?
  - The Consistency Check does not work on RAID0 because it has no redundancy.

---

## Error with the Battery of the Onboard RAID Controller (MegaRAID ROMB)

The battery is charged and discharged when it is replaced or when the server is installed. While performing this cycle, the following error message may appear on the POST screen, however, it is not a problem in operating the system.

Your battery is bad or missing, and you have VDs configured for write-back mode. Because the battery is not usable, these VDs will actually run in write-through mode until the battery is replaced.  
The following VDs are affected : xx,xx,xx,xx,xx,xx

**The following message appears during POST:**

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).

→ The battery of Onboard RAID Controller (MegaRAID ROMB) may be faulty. Contact your service representative.

**The battery of the Onboard RAID Controller (MegaRAID ROMB) is not recognized, or the following message appears during POST:**

Your battery is bad or missing, and you have VDs configured for write-back mode. Because the battery is not usable, these VDs will actually run in write-through mode until the battery is replaced.  
The following VDs are affected: xx  
Press any key to continue.

The battery charging rate may be low.

→ Power on the server for several hours to charge battery. After that, check the POST message again. You can use WebBIOS to check the battery status on the Battery Status screen. If the battery is still not recognized, the battery may be faulty or dead. The life of the battery is approximately two years. Contact your service representative.

---

## Problems with Windows Autorun Menu

### Cannot read online document:

Is Adobe Reader installed correctly in your system?

→ Some online documents are supplied in PDF format. To read a PDF document, Adobe Reader is required in your system.

Is the operating system Windows XP SP2?

→ With Windows XP SP2, the following information may appear in the browser.

"To help protect your security, Internet Explorer has restricted this file from showing active content that could access your computer. Click here for options..."

1. Click the Information Bar.  
The shortcut menu appears.
2. Click [Allow blocked content].  
The security alert dialog box appears.
3. Click [Yes] on dialog box.

### The menu fails to appear:

Is your system Windows XP or later, or Windows 2003 or later?

→ The Windows Autorun menu is supported by Windows XP/Windows 2003 or later.

→ If your system runs on Windows Autorun Menu on Windows 2000 system, you need to setup IE6.0 before using Windows Autorun Menu.

Did you press **Shift**?

→ Setting the DVD/CD-ROM with **Shift** pressed down cancels the Autorun feature.

Is the system in the proper state?

→ The menu may not appear depending on the system registry setting or the timing to set the DVD/CD-ROM. In such a case, start the Explorer and double-click the icon of the optical disc drive.

### Some menu items are grayed-out:

Is your system environment correct?

→ Menu items are grayed-out when the logged on user does not have the Administrator authority or when the system does not meet the requirements to install the application. Login with a user having the proper authority on the proper system, and try again.

## COLLECTING THE EVENT LOG

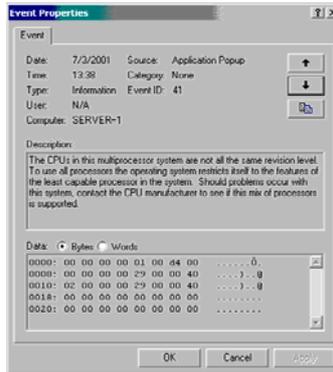
This section describes how to collect the log of the various events that occurred on the server.

---

**IMPORTANT:** If a STOP error, system error, or stall occurred, follow the procedure below after restarting the system.

---

**NOTE:** A different revision processor may be mixed in the additional CPU kit. When Windows is used, the following message may appear in the System Log of the Event Viewer . If this message is logged, it is not a problem for system operation.



1. Click [Management Tool] → [Event Viewer] from the Control Panel.
2. Select the type of the log to collect.  
On [Application Log], the events related to the running application are archived.  
On [Security Log], the events related to the security are archived.  
On [System Log], the events which occurred at the item which configures Windows system are archived.
3. Click [Save as...] in the [Run] menu.
4. Input the file name of an archived log in the [File Name] box.
5. Select the type of the log file you want to save in the [File Type] list box and click [OK].

For more information, refer to Windows Online Help.

## COLLECT THE CONFIGURATION INFORMATION

This section describes how to collect the information on the hardware configuration and the inside specifications.

In order to collect information, use the "Diagnostic Program".

---

**IMPORTANT:** If a STOP error, system error, or stall occurred, follow the procedure below after restarting the system.

---

1. Point to [Settings] in Start menu, and click [Control Panel].  
The [Control Panel] dialog box appears.
2. Double-click [Management Tool], and double-click [Computer Management].  
The [Computer Management] dialog box appears.
3. Click [System Tool] → [System Information].
4. Click [Save as System Information File] in the [Operation] menu.
5. Input the file name to save in the [File Name] box.
6. Click [Save].

## COLLECTING DR. WATSON DIAGNOSTIC INFORMATION

Dr. Watson collects diagnostic information related to application errors. The location in which to save the information can be specified as you like. For more information, refer to Chapter 5.

### MEMORY DUMP

If an error occurs, the dump file should be saved to acquire the necessary information. You can specify the location of your choice to save the diagnostic information. For more information, refer to "Specifying Memory Dump (Debug Information (refer to Chapter 5 for detail))"

If you saved the dump to a DAT, label the tape as "NTBackup" or "ARCServe".

---

**IMPORTANT:**

- Consult with your service representative before dumping the memory. Dumping the memory while the server is operating normally can affect the system operation.
  - Restarting the system due to an error may display a message indicating there is 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 prevent the server from restarting. 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 the POWER/SLEEP switch operation.

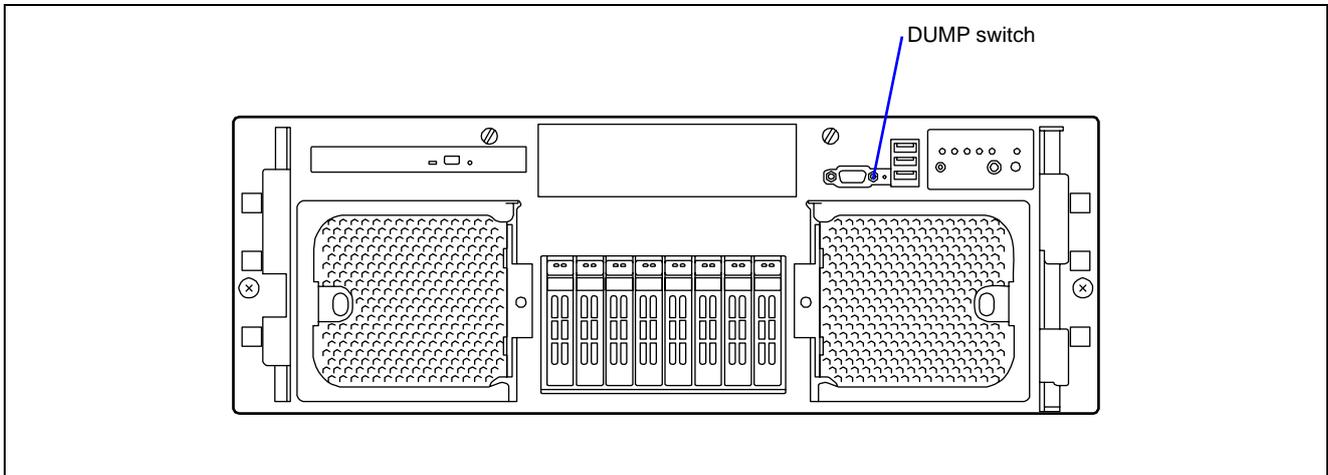
Follow the procedure below to change the setting to enable the forced shutdown and restart of the server.

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

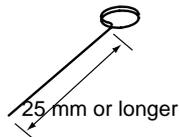
Press the DUMP switch to save the dump file when an error occurs. Insert a metal pin (a straightened large paper clip will make a substitute) into the switch hole to press the DUMP switch.



Pressing the DUMP switch saves the dump file in the specified directory. (Memory dumping may not be available when the processor stalls.)

---

**IMPORTANT:** Do not use a toothpick or plastic stick that could easily break. Use a pin having a minimum length of 1 inch (25 mm).



---

## Recovery for Windows Server 2003 x64 Editions and Windows Server 2003

If the system fails to start for some reason, recover the system using the recovery console. However, recovery using this method should be performed only by a system administrator or a user who has an expert knowledge of this subject. See the Online Help for details.

## REMOTE MANAGEMENT FEATURE

The server uses a BMC (Baseboard Management Controller) which is the system management LSI, to monitor the internal hardware status including system temperature, voltage, and electric power. It also generates a System Event Log (SEL) at the occurrence of a hardware failure, and notifies it. When a management LAN is connected with the network, the server may be managed from the remote console via the BMC by using Web browser or Telnet/SSH client. If an optional Remote Management Enhanced License is installed, the remote device feature becomes available. With the remote device feature, the remote console can use the KVM (keyboard, video, and mouse) of the server. The server can access the optical disc drive, floppy disk drive, ISO image, and USB memory device of the remote site.

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

---

**NOTE:** The measured value of temperature, voltage, fan, or electric power may be influenced by the operating environment.

---

---

### Changing the Management LAN Settings

The management LAN uses the management LAN port in ordinary case.

To share the LAN port #3 with the management LAN, run SETUP and select [Server] - [BMC LAN Configuration] - [Shared BMC LAN] - [Enabled]. When set to [Enabled], the management LAN port is disabled.

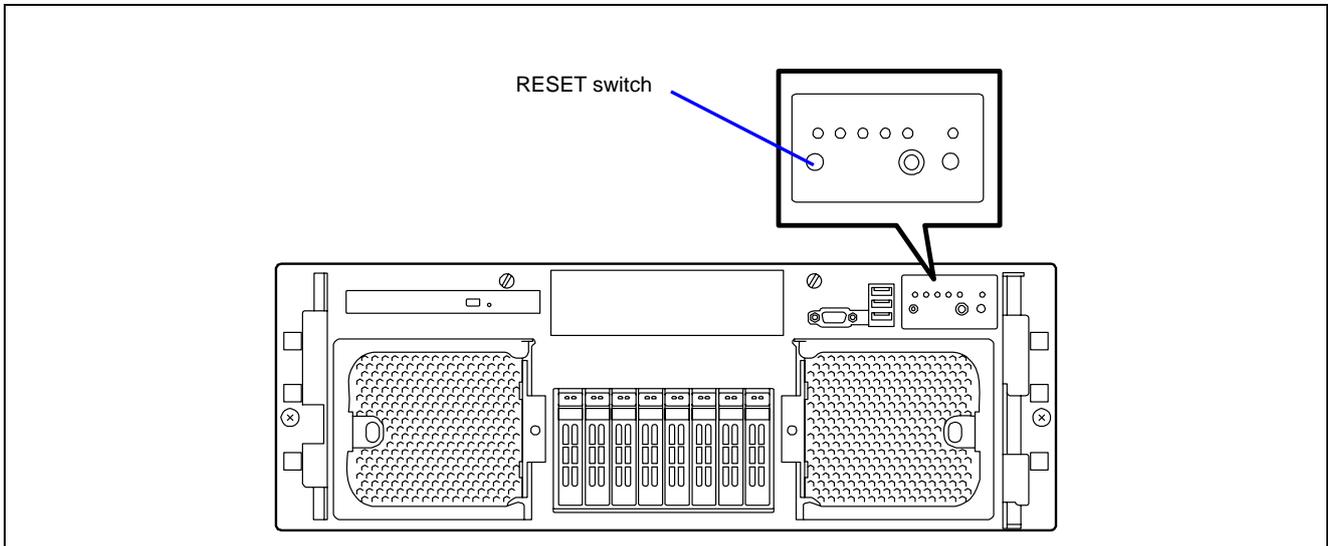
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**IMPORTANT:**

- When the management LAN port is used as a management LAN, the link speed is fixed to 100Mbps. When the LAN port 3 is used as a management LAN, the link speed is 10Mbps in standby state, or 100Mbps in power-on state. (Up to 1.0Gbps is available for the shared standard LAN.) Accordingly, if the LAN cross cable is used for connection, the LAN cable seems to be disconnected when the link speed is switched. Do not use the LAN cross cable for connection.
  - When the LAN port 3 is used as a management LAN, the network performance may be reduced because the data of both LANs must be transmitted or received.
-

## RESETTING THE SERVER

- If the server halts before starting the OS, press and hold **Ctrl, Alt** and **Delete**. This restarts the server.
- Pressing the **RESET** switch on the front panel reboots the server.



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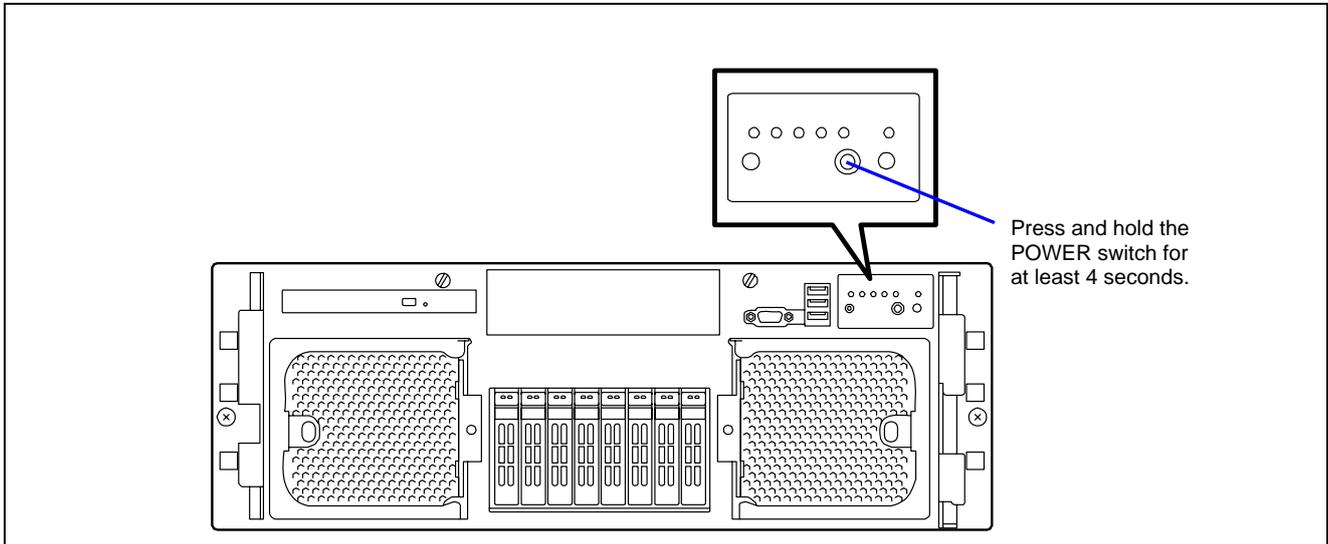
**IMPORTANT:** Resetting the server clears the DIMM memory and the data being processed. To reset the server when it is not frozen, make sure that no process is in progress.

---

## FORCED SHUTDOWN

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

Press and hold the POWER/SLEEP switch on the server for at least four seconds. The power is forcibly turned off. Wait at least 10 seconds before powering on again.



---

**IMPORTANT:** If the remote power-on function is used, cycle the power once to load the OS, and power off again in the normal way.

---

# Chapter 9

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## Upgrading Your Server

This chapter describes the internal optional devices available for the server, the procedures for the installation or removal of such optional devices, and notes on using them.

---

**IMPORTANT:**

- Optional devices described in this chapter may be installed or removed by any user. However, the manufacturer does not assume any liability for damage to optional devices or the server or malfunctions of the server resulted from any installation by the user. We recommend you ask your service representative to proceed with the installation or removal of any optional devices.
  - Make sure to use only optional devices and cables authorized by the manufacturer. Repair of the server due to malfunctions, failures, or damage resulting from the installation of inappropriate devices or cables will be charged.
  - When you made any changes to the hardware configuration, make sure to update the system (see Chapter 5 for details.).
- 

### SAFETY NOTES

Observe the following notes to install or remove optional devices safely and properly.

 <b>WARNING</b>	
	<p>Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injuries. See the pages 1-3 to 1-8 for details.</p> <p>Do not disassemble, repair, or alter the server. Do not look into the optical disc drive. Do not remove the lithium, and/or the NiMH battery. Disconnect the power plug before working with the server.</p>

 <b>CAUTION</b>	
	<p>Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injuries, or property damage. See pages 1-3 to 1-8 for details.</p> <p>Do not lift the server only by a single person. Make sure to complete the board installation. Do not install the server in the rack without its cover. Do not pinch your fingers with mechanical component. Be aware that some components or parts of the server may be very hot. Put a connector cover on an unused connector.</p>

## ANTI-STATIC MEASURES

The server contains electronic components sensitive to static electricity. Avoid failures caused by static electricity when installing or removing any optional devices.

- Wear an anti-static wrist strap (an arm belt or anti-static glove).  
If no anti-static 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 an anti-static or concrete floor.
  - When you work with the server on a carpet where static electricity is likely to be generated, make sure to take anti-static measures beforehand.
- Use a work table.  
Place the server on an anti-static mat to work with it.
- Clothing
  - Do not wear a wool or synthetic cloth.
  - Wear anti-static shoes.
  - Take off any jewels (a ring, bracelet, or wrist watch).
- 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 the installation or removal of some components.

1. Shut down the OS.
2. Press the POWER/SLEEP switch to power off the server (the POWER/SLEEP LED goes off).
3. Unplug the power cord from the AC inlet on the server (the AC Standby LEDs on the power supply module located at rear of the server go off).
4. Remove all the cables connected to the server on the rear panel.
5. Free an area of 1m to 2m in the front and rear sides and left and right sides of the server.

---

**NOTE:** Make sure to disconnect the power cord from the outlet before installing or removing the option devices. If you disconnect internal cables while the power cord is connected, the STATUS LED will light amber when the server is powered on. Disconnect the power cord, connect it again, and then restart the server.

---

# DEVICE INSTALLATION OR REMOVAL PROCEDURE

Install or remove a component from the server as described in the following procedure.

---

## 2.5-inch Hard Disk Drive

The 2.5-inch device bay on the front of the server contains eight slots in which hard disk drives can be installed. The device bay is not equipped with any hard disk drives (excluding when one or more built-in hard disk drives are ordered). Purchase additional hard disk drives if necessary.

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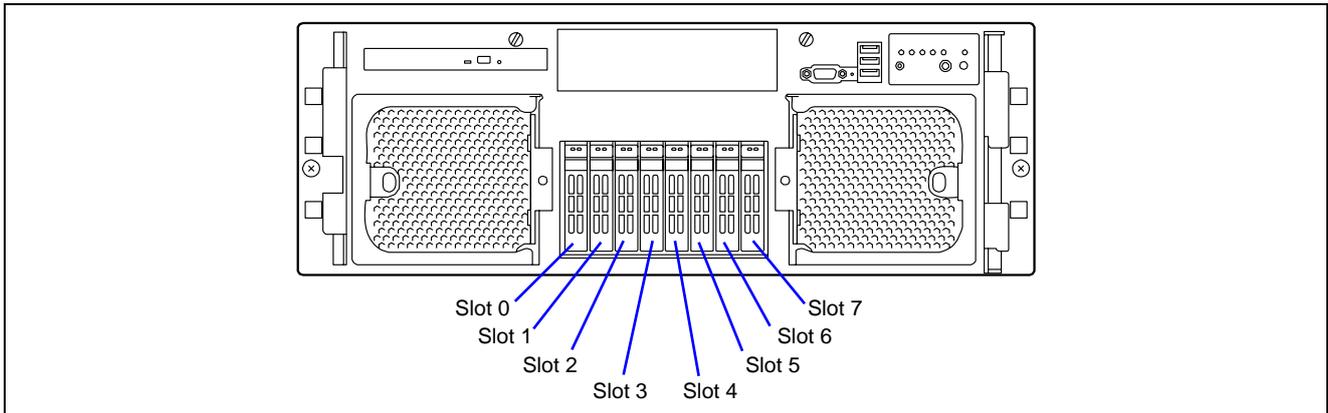
### IMPORTANT:

- Do not use any hard disk drives that are not authorized by the manufacturer. Installing a third-party's hard disk drive may cause a failure of the server as well as the hard disk drive. Purchase hard disk drives of the following models:

- 73.2GB HDD (10,000rpm)
- 146.5GB HDD (10,000rpm)
- 36.3GB HDD (15,000rpm)
- 73.2GB HDD (15,000rpm)

The supported RAID level depends on the RAID Controller that is used.

- Onboard RAID Controller:  
RAID0, RAID1, RAID5, RAID6, RAID10, and RAID50 (See "RAID System Configuration" in Chapter 4.)
  - Optional RAID Controller:  
Refer to the RAID Controller User's Guide.
- 



In a RAID System configuration, use the same hard disk drives model.

A dummy tray is installed in the 2.5-inch disk bay that do not include a hard disk drive. The dummy tray increases the cooling effect in the server.

### Installation

Follow the steps below to install a hard disk drive. This procedure applies to all the slots.

---

**NOTE:** A hard disk drive can be installed or removed in or from the server only by removing the front bezel without pulling out the server from the rack. In a RAID System configuration (except for RAID0), the hard disk drive can be installed or removed without powering off the server.

---

---

**IMPORTANT:** In a RAID System configuration, use hard disk drives of the same model.

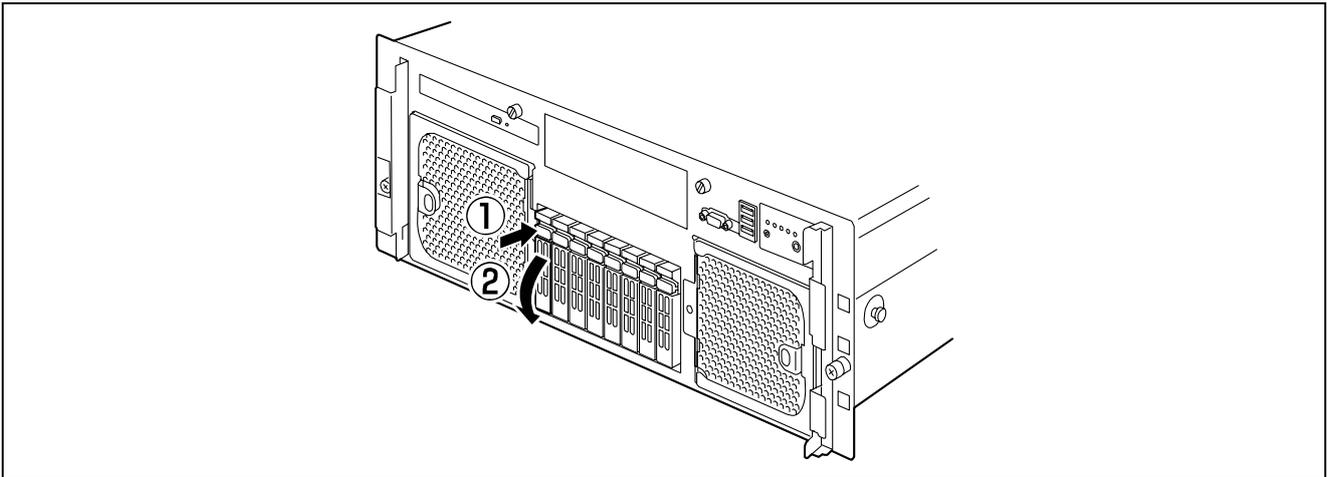
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1. See the section "Preparing for Installation and Removal" described earlier (except for RAID System configuration).
2. Unlock the front bezel using the security key, and remove the front bezel.
3. Locate the slot in which you are going to install a hard disk drive.  
The server has eight slots.
4. Remove the dummy tray.

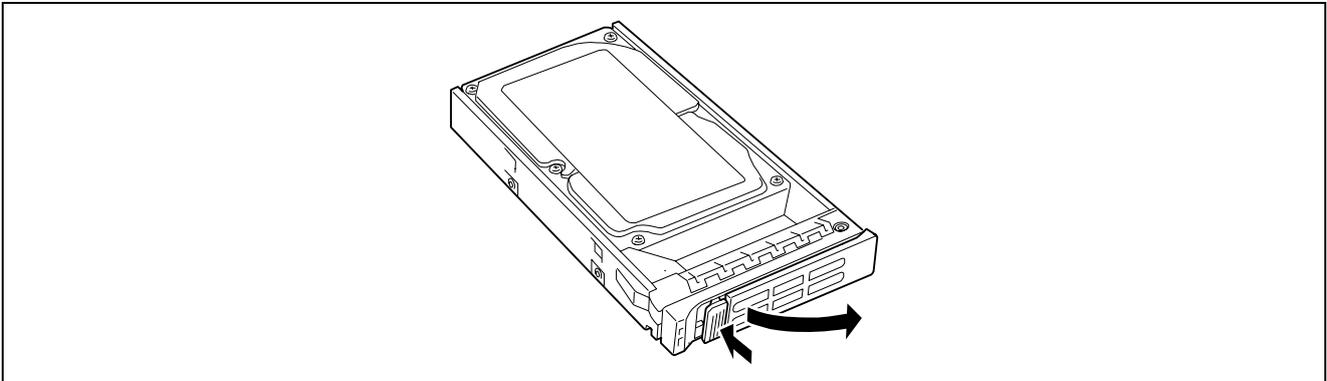
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**IMPORTANT:** Keep the dummy tray for future use.

---



5. Unlock the hard disk drive.

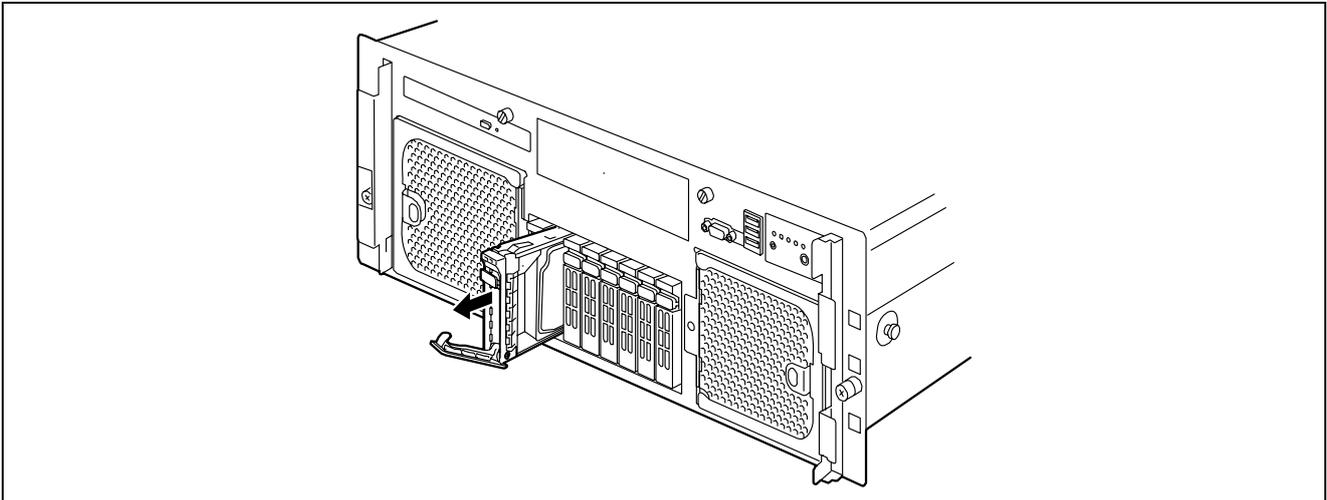


- Firmly hold the additional hard disk drive and handle, and insert it into the slot.

---

**IMPORTANT:**

- Push the hard disk drive until the handle hook touches the frame.
  - Carefully hold the hard disk drive with both hands.
  - Slowly and carefully push the hard disk drive straight into the slot, to prevent causing any shocks or vibrations.
- 



- Slowly close the handle until it clicks into place.

---

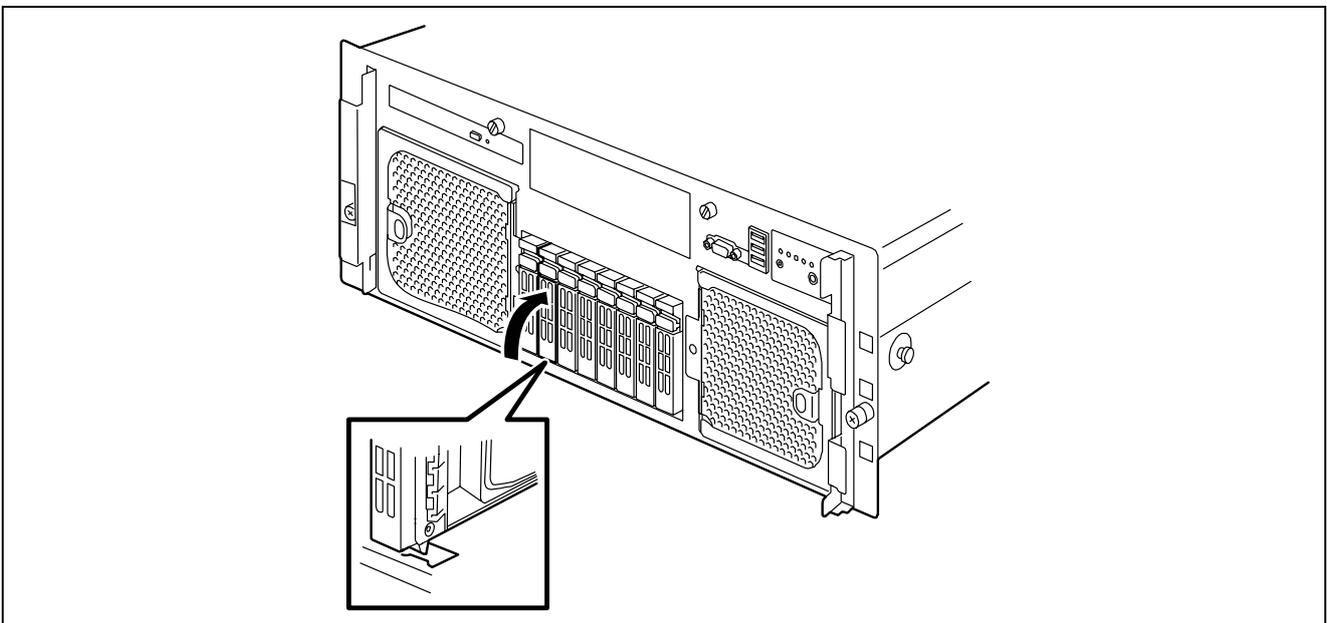
**IMPORTANT:** Do not catch your finger between the handle and the tray.

---

---

**NOTE:** Confirm that the handle is hooked to the frame.

---

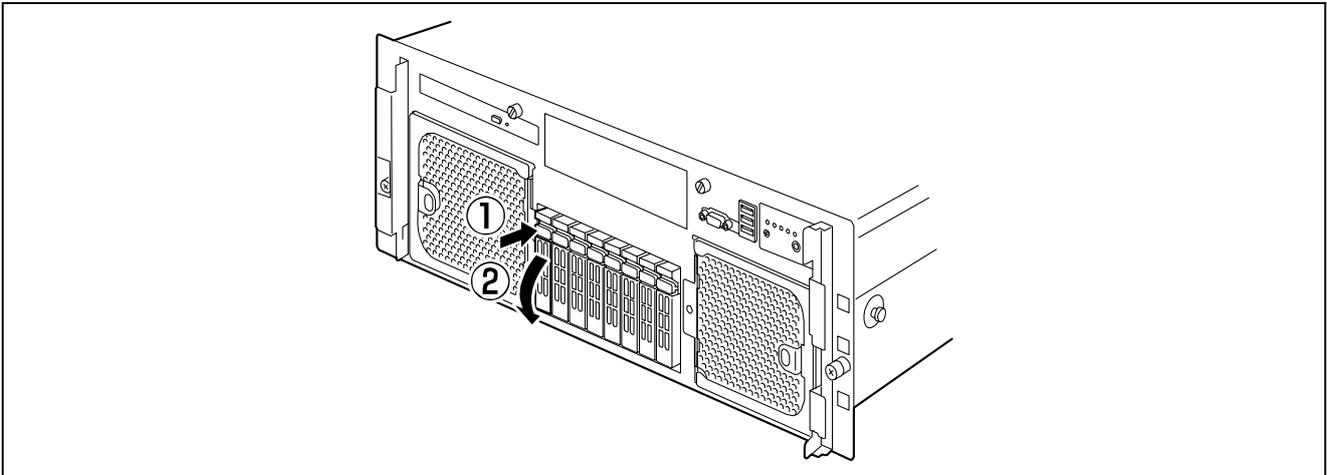


- Install the front bezel that was removed in step 2.

## Removal

Follow the steps below to remove the hard disk drive. To use the server with a hard disk drive removed, insert a dummy tray into the empty slot.

1. Shutdown the system and press the POWER/SLEEP switch to turn off the power.
2. Unlock the hard disk drive.

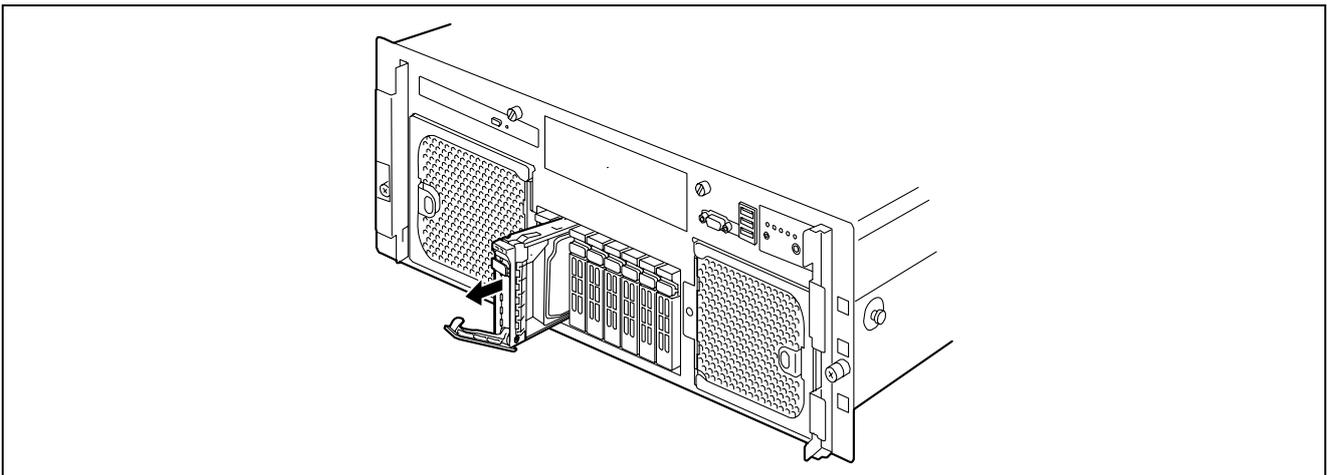


---

**IMPORTANT:** Slowly and carefully take out the hard disk drive straight from the slot to prevent causing any shocks or vibrations.

---

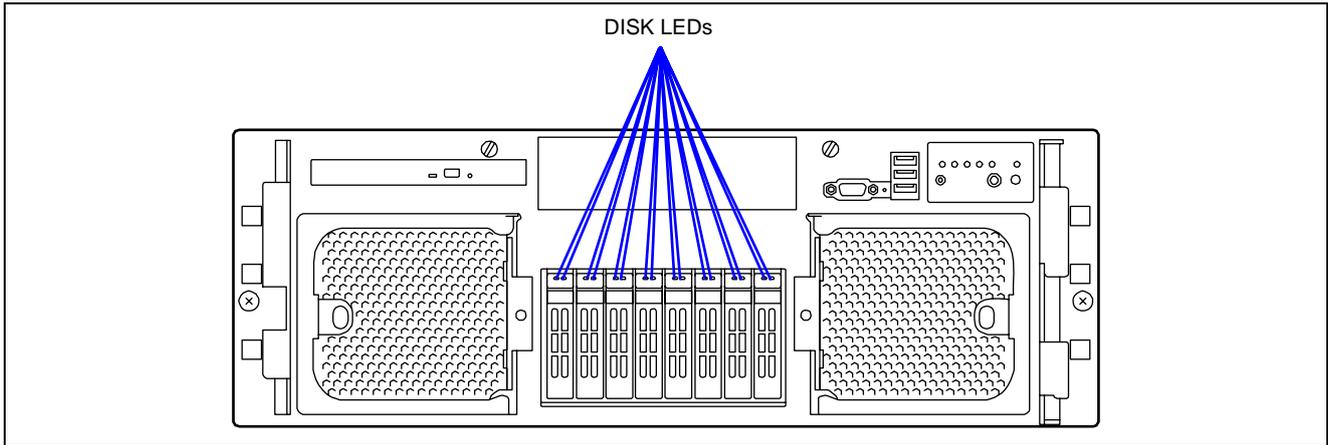
3. Firmly hold the additional hard disk drive and handle, then take them out.



---

**NOTE:** The LED of a failed hard disk drive is lit amber.

---



When the hard disk drives are in a RAID System configuration, you can restore the state before an error using the auto-rebuild feature that stores the data in the old hard disk drive into a new one. The auto-rebuild feature may be enabled or disabled depending on the RAID level.

Auto-rebuild is automatically carried out when you hot-swap a failed hard disk drive with a new one (replace the disk while the server is powered). While auto-rebuild is in progress, the DISK Access LED and DISK Error LED flash alternatively to indicate it.

---

**IMPORTANT:** When the auto-rebuild fails, the DISK LED lights in amber. Remove and install the hard disk drive again to restart the auto-rebuild.

---

Observe the following notes for the auto-rebuild.

- Do not power off the server in the period between a hard disk drive error and the completion of the auto-rebuild.
- Wait at least 60 seconds between the removal of a failed hard disk drive and the installation of a new one.
- Do not replace another hard disk drive while a rebuilding is in progress. (The DISK Access LED and DISK Error LED flash alternatively while rebuilding the hard disk drive.)

---

## **Power Supply Unit**

The server can continue its operation without interruption even if a single power supply unit fails (power redundant configuration).

In addition, if the AC power of each power supply unit is divided into two lines, the server can continue its operation without power interruption even if one of the AC power line fails (AC power redundant configuration).

If the power cord is disconnected from the power supply unit immediately after it is connected, the event "power degraded" may not be registered in the OS event log, and only the event "power recovered" is registered.

### **How to enable the redundant power feature**

Your server is configured with the 100 VAC non-redundant power supply system at the factory.

To use your server with the redundant power system (100 VAC or 200 VAC), update the Platform Information Area (PIA) and Sensor Data Record (SDR) in the server firmware. Contact your supplier to obtain the latest firmware.

## Replacing a Failing Power Supply Unit

---

**IMPORTANT:** Do not remove a power supply unit operating normally.

---

**NOTE:** If the server is operating in power redundant configuration and one of the power supply unit works normally (the POWER LED on the power supply unit is lit), the failing power supply unit can be replaced without powering off the system. (Skip step 2.)

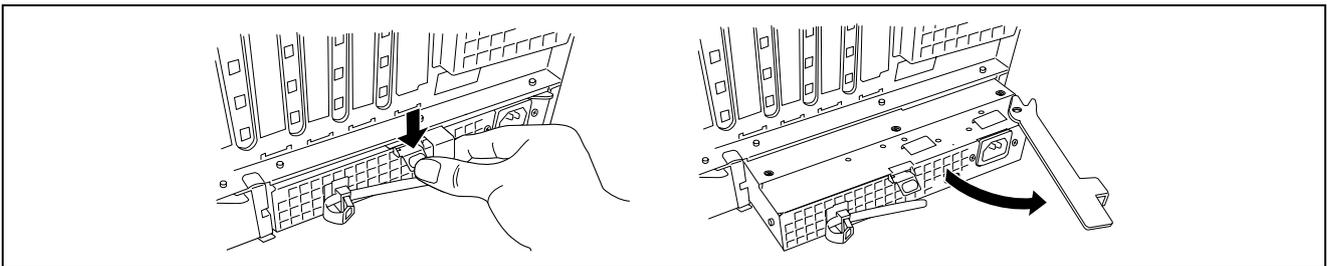
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1. Check the POWER LED on the power supply unit and determine which unit needs to be replaced.  
The LED of the failing power supply unit is off.
2. Shutdown the system, and press the POWER/SLEEP switch to turn off the server.
3. Disconnect the power cord.
4. Unlock the power supply unit, hold the handle, and slowly pull out the power supply unit toward you.

---

**IMPORTANT:**

- To avoid damaging the power supply unit and/or connector, do not tilt or twist the unit as you pull it from the power supply bay. Use even, steady force to remove the unit.
  - If the power supply unit that is working in redundant power configuration is replaced while the power is on, the power supplies must be hot-swapped within two minutes. This time period applies only from the time that the power supply is physically removed, not from the time of the failure.
- 



5. Install the new power supply unit, and confirm that the power supply unit is installed normally.

---

**NOTE:** If the power supply unit is replaced while the power is on, the POWER LED of the new power supply unit lights immediately. (If it is replaced while the power is off, the LED lights after the power is turned on.)

---

## Server ~ Pulling Out from the Rack Cabinet ~

The server needs to be pulled out from the rack in order to install/remove any other components than the hard disk drives and power supply units.

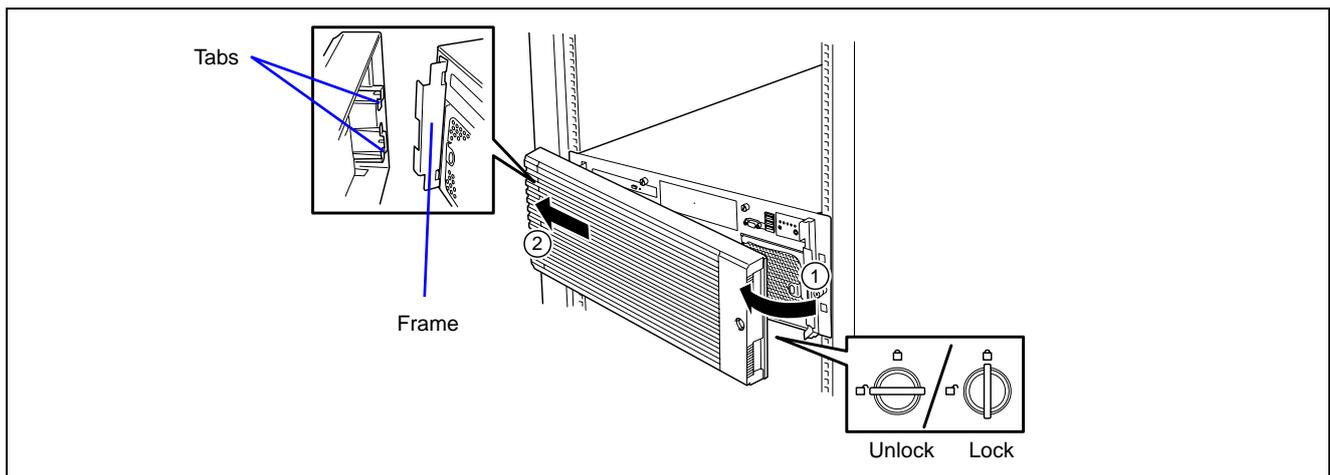
**⚠ CAUTION**



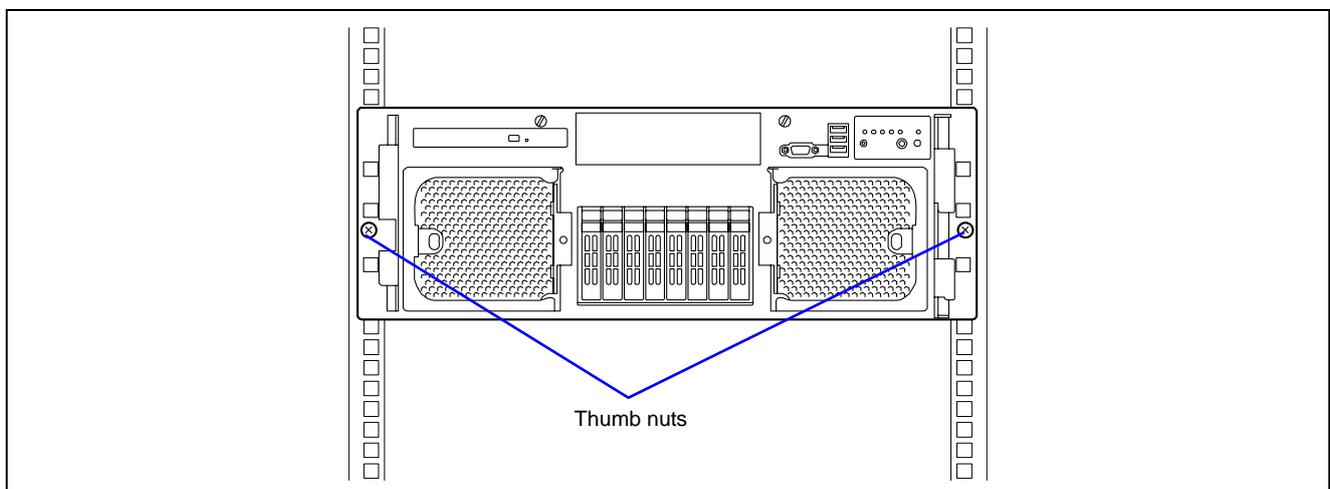
Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Do not install the server in a rack without its cover.
- Do not pinch your finger with mechanical components.
- Be aware that some components or parts of the server may be very hot.
- Do not pull out a device from the rack if the rack is unstable.
- Do not pull several devices at a time from the rack.

1. See the section "Preparing for Installation and Removal" described earlier.
2. Remove the front bezel.



3. Loosen the two thumb nuts from the front of the server.



4. Slowly pull out the server from the rack.

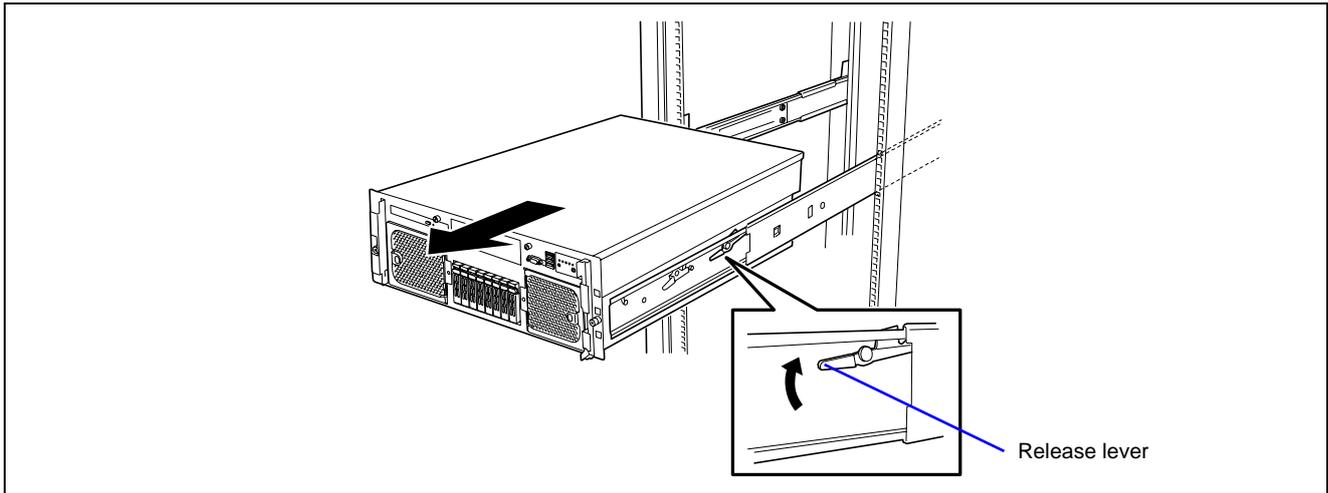
The server is latched when a "click" is heard.

To push the server into the rack, lift the green release levers at both sides of the rail (using a screw driver) to unlatch the server. Make sure your fingers do not get caught in the process.

---

**IMPORTANT:**

- Push each release lever using a screwdriver or a similar tool. Pushing a release lever with your fingers may cause serious injuries.
  - Two release levers are provided on each side of the rail. Release only the green levers.
- 



---

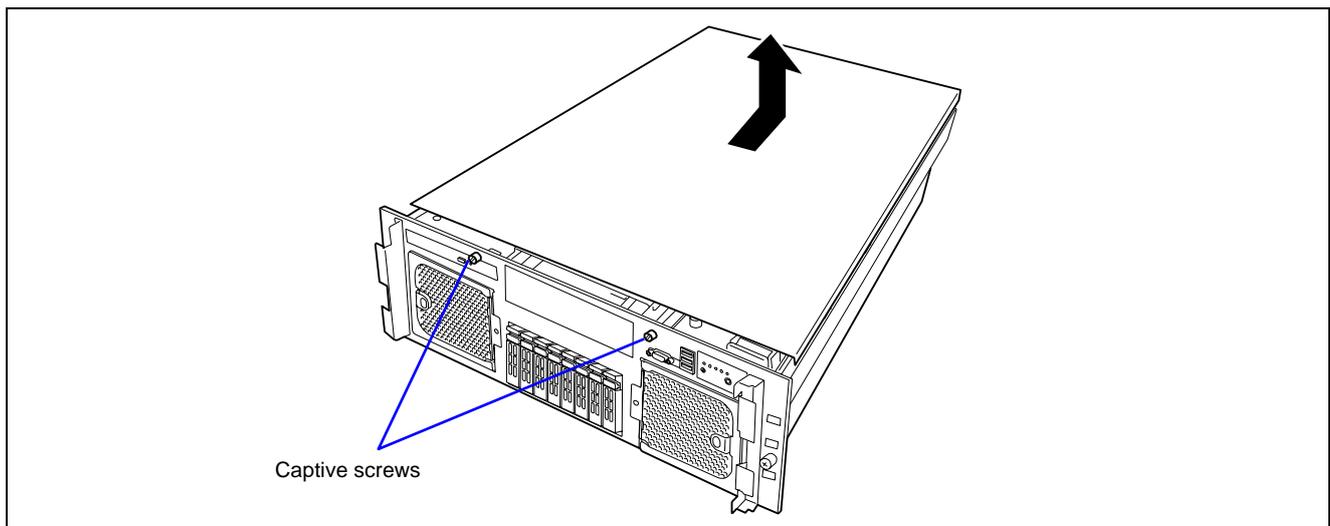
## Top Cover

To install or remove the PCI board, or to change the internal cable connections, you will need to remove the top cover.

<b>⚠ CAUTION</b>	
	Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.  *Power off the server before removing the top cover.

## Removal

1. See the section "Preparing for Installation and Removal" described earlier.
2. Remove the front bezel.
3. Pull out the server from the rack.
4. Loosen the two captive screws on the front panel.
5. Slide the top cover toward the rear of the chassis.
6. Lift the cover up and away from the chassis.



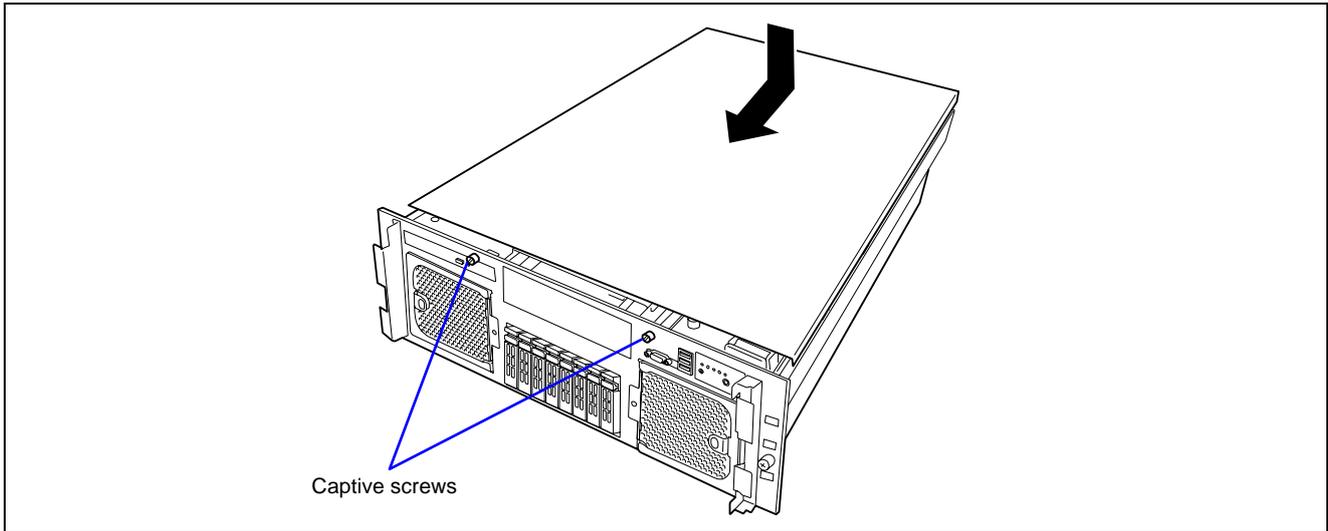
## Installation

---

**IMPORTANT:** Before installing the top cover, check that you have not left any tools or loose parts inside the system.

---

1. Position the cover on the chassis so that the cover tabs align with the chassis slots.
2. Press lightly down on the cover, and slide it toward the front of the chassis.
3. Attach the cover to the chassis using the captive screws located on the front panel.



---

## 5-inch Device

The server has one slot for a backup device such as a magnetic tape drive.

### Available Devices

The 5-inch device slot can contain a single-height SCSI device or a USB device.

- Setting of the SCSI ID when using a SCSI device  
Refer to the manual that comes with the SCSI controller.
- Setting the terminator  
Set the terminator to "OFF".

---

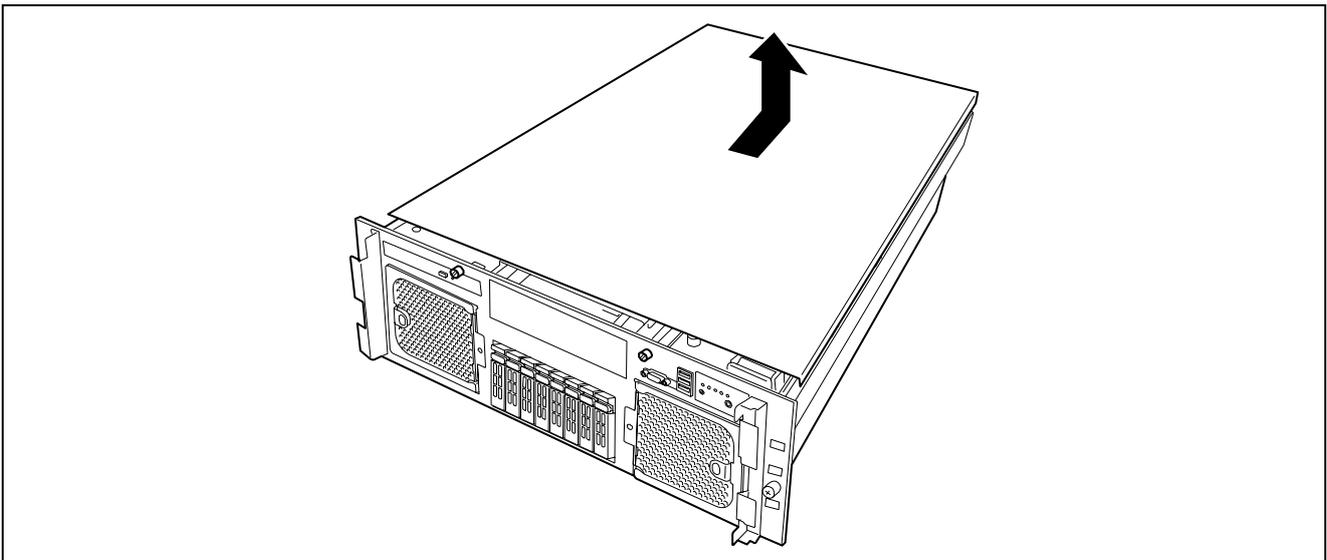
**IMPORTANT:** To use a SCSI tape device, connect it to the optional SCSI controller.

---

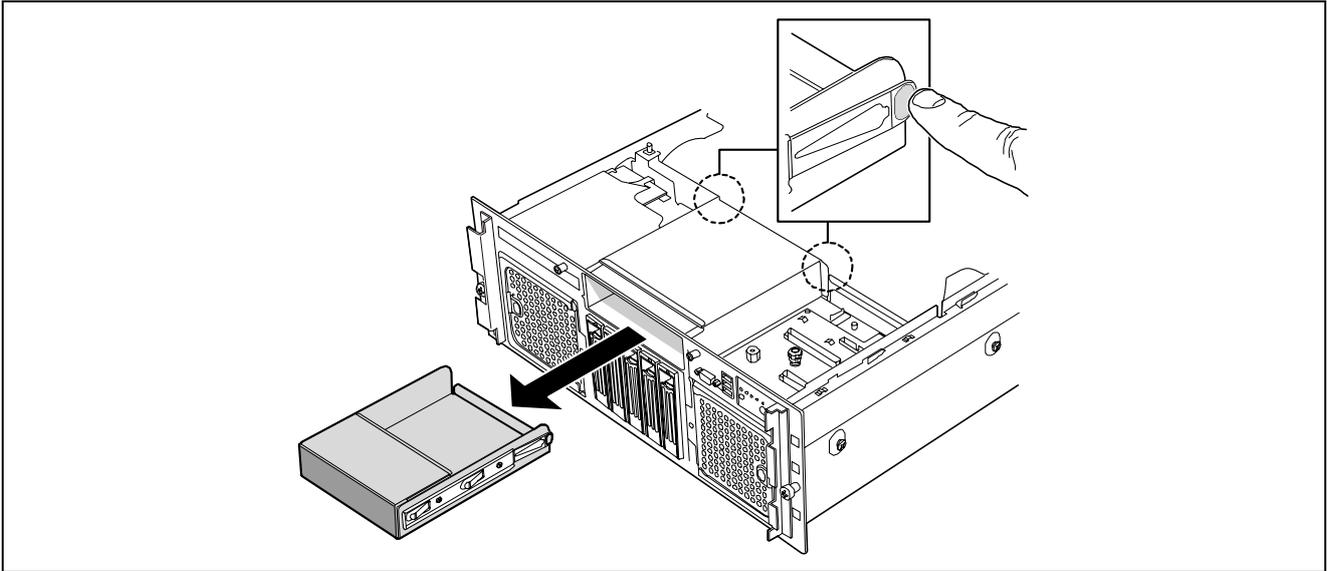
### Installation

Follow the steps below to install the 5-inch device.

1. See the section "Preparing for Installation and Removal" described earlier.
2. Unlock the front bezel using the security key, and remove the front bezel.
3. Remove the two screws, and remove the top cover from the server.



4. Push the levers on both sides of the rear of the dummy tray to unlatch the tray, then pull out the dummy tray toward the front.

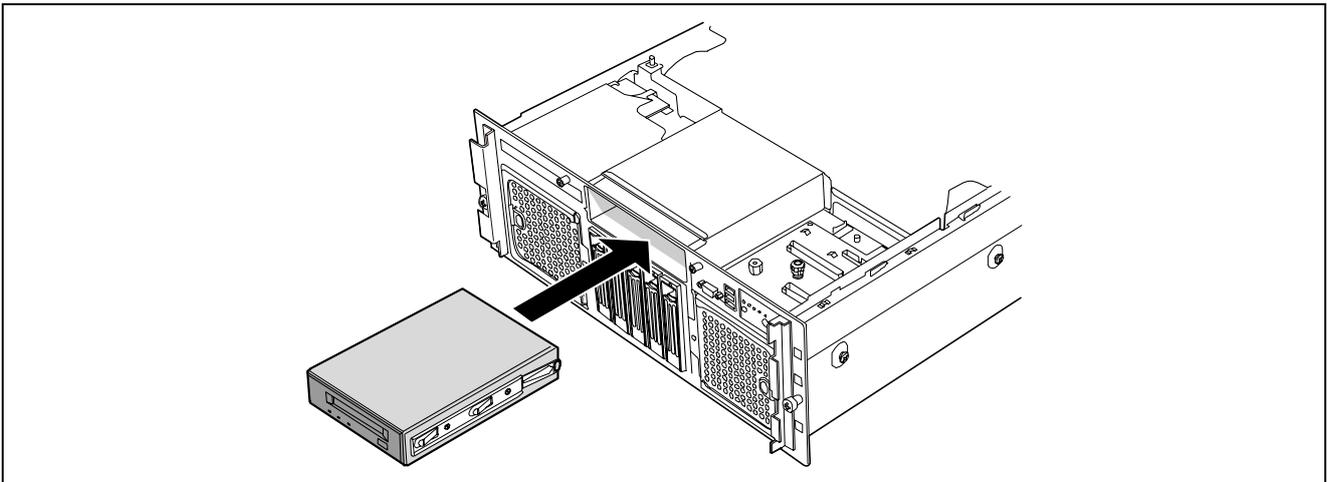


5. Remove the rails from both sides of the dummy tray, and attach them to the tape device.
6. Connect the power cable of the server, and connect the SCSI/USB cable coming with the device.
7. Insert the tape device into the server chassis until it is locked.

---

**NOTE:** Some devices may protrude from the chassis by several millimeters.

---



8. Route the signal cable.
9. Install the top cover.

## Removal

Remove the 5-inch device in the reverse procedure of the installation.

---

## PCI Board

The server contains seven slots for PCI Express board.

Some PCI Express boards support the hot-plug function, meaning that they may be installed or removed while the server is powered on. Your server supports the hot-plug function if Windows Server 2003 is used as an operating system. See the "List of Optional Devices and their Available Slots" on page 9-24 to identify the PCI boards supporting the hot-plug function.

---

**IMPORTANT:** The PCI board is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the PCI board. Do not touch the PCI board terminals or the on-board parts with your bare hand or place the PCI board directly on the desk. For more information on static electricity, see the section "Anti-static Measures".

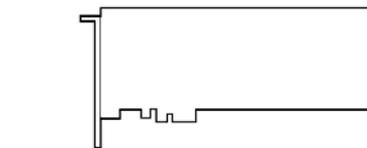
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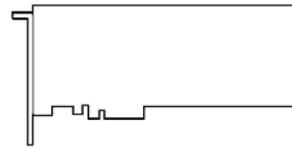
### NOTES:

- The tab on the PCI board slot is color-coded to indicate whether it the inserted card can, or not, be hot-plugged. The hot-plug slots have a green tab (PCI slots #1 and #2), and the non-hot-plug slots have a blue tab (PCI slots #3 through #7).
  - There are four types of PCI Express boards, x1, x4, x8, and x16. The PCI board slots of the server can contain x1, x4, or x8 board.
- 

The PCI Express boards are x1, x4, x8, and x16. The server can contain x1, x4, and x8 PCI Express boards.



PCI Express board (x4)



PCI Express board (x8)

## RAID Controller Considerations

Note the following on the configuration of a RAID System by using the on-board or optional RAID Controller (Disk Array Controller).

- To change the RAID System configuration or the RAID, the hard disk drives must be initialized. If important data is saved on the hard disk drives used to constitute the RAID System, first back up the data in other hard disk drives before installing boards and configuring the RAID System.
- More than one hard disk drive is required to configure a RAID System.
- Hard disk drives used in the RAID System configuration should have the same disk revolution rate and capacity in packs.
- See the table on the next page to identify the slot in which an optional board can be installed.
- Up to three RAID Controllers can be installed in the server.
- Several RAID (Redundant Arrays of Inexpensive [Independent] Disks) levels can be set for the RAID System configuration in the server. See "RAID System Configuration" described later for available RAIDs, data transfer rate, and array configuration.  
For the optional RAID Controller (Disk Array Controller), refer to the documentation coming with the RAID Controller for details.
- The available capacity of the hard disk drives in the RAID System configuration is lower than the total capacity of the hard disk drives configuring the RAID System, but the disk reliability is improved (for RAID 1, 5, 6, 10, or 50).
- Set "Option ROM Scan," a parameter of the slot in which a hard disk drive is installed, to "Disabled" in "PCI Configuration" on the Advanced menu of the BIOS utility SETUP. (The "Enabled" is factory-set.) If two or more RAID Controllers are installed, set only the slot containing the board to boot-up to "Enabled". Do not set "Option ROM Scan" for Onboard SAS to "Disabled".
- In RAID System configuration, the total physical capacity of hard disk drives contained in a Disk Array or Logical Drive must not exceed 2TB (terra bytes).
- Linux cannot be installed in a Logical Drive having a capacity of 1TB or larger.
- Replacement of the optional RAID Controller (Disk Array Controller)  
Back up the RAID System configuration information in the RAID Controller to the floppy disk and restore it to the replaced RAID Controller. Refer to the manual that comes with the RAID Controller for details.
- When several RAID Controllers are installed in the server, install the RAID Controller to which the system disk is connected in the PCI slot having the highest boot priority.  
Boot priority: Onboard SAS RAID → PCI #7 → Onboard LAN #1/#2 → Onboard LAN #3/#4 → PCI #6 → PCI #5 → PCI #4 → PCI #3 → PCI #2 → PCI #1
- For configuration information of the Onboard RAID Controller (MegaRAID ROMB), you can use the Tools menu in EXPRESSBUILDER to store or restore the information in/from the floppy disk.

## List of Optional Devices and their Available Slots

Product name	PCI Express							Remarks
	#1	#2	#3	#4	#5	#6	#7	
	Bus A	Bus B	Bus C	Bus D	Bus E	Bus F	Bus G	
x8 lane			x4 lane					
Slot size	Full-height							
PCI board type	x8 socket							
Available board size	Long/short		Short		Long/short			
Hot-plug	Hot-plug		Non-hot-plug					
LSISAS3443E-R SAS controller (For Disk Array Unit ST12300 SATA-HDD model/Disk Array Unit ST12300 SAS-HDD model only) (x8)	√	√	√	√	√	√	√	Up to two cards can be installed
Disk Array controller (for external SAS) (x8)	–	–	√	√	√	√	√	Up to three cards can be installed
1000Base-T adapter (2ch) (x4)	√	√	√	√	√	√	√	Up to two cards can be installed Hot-pluggable
10GBase-SR adapter (1ch)	√	√	√	√	√	√	√	Up to two cards can be installed
1000Base-T adapter (1ch) (x1)	√	√	√	√	√	√	√	Up to three cards can be installed Hot-pluggable
Fibre Channel controller (4Gbps/Optical) (x4)	√	√	√	√	√	√	√	Up to four cards can be installed
Fibre Channel controller (2ch) (x4)	√	√	√	√	√	√	√	Up to four cards can be installed

√: Can be installed. –: Cannot be installed.

### NOTES:

- The system BIOS assigns the PCI bus numbers in the order shown below.  
Onboard SAS RAID → PCI #7 → Onboard LAN #1/#2 → Onboard LAN #3/#4 → PCI #6 → PCI #5 → PCI #4 → PCI #3 → PCI #2 → PCI #1
- The system BIOS executes the Option ROM in the order shown below.  
Onboard LAN #1/#2 → Onboard LAN #3/#4 → PCI #5 → Onboard SAS RAID → PCI #7 → PCI #4 → PCI #3 → PCI #2 → PCI #1 → PCI #6

## Onboard LAN Controller Considerations

It is possible to configure the Teaming function of AFT (Adapter Fault Tolerance)/ALB (Adaptive Load Balancing) in a standard network controller (on board LAN controller). It is not possible to configure the Teaming function of the same AFT/ALB on a standard network controller and an optional LAN board.

When teaming is configured among the onboard LANs, the following system event log appears when Windows starts. You can ignore this message.

source: iANSMiniport

event IDs: 11/13/16/22

The controller of LAN3/4 is indicated as "PCI Slot 240" on the Windows Device Manager, however, it is not an error.

## Non-hot-plug PCI Boards

Follow the procedure below to install or remove a non-hot-plug PCI board.

### Installation

Follow the steps below to install a board in a PCI board slot.

---

**IMPORTANT:**

- PCI board slots #1 to #4 can accept x8 PCI Express boards.
  - PCI board slots #5 and #7 can accept x4 PCI Express boards.
- 

**NOTES:**

- Before installing the PCI board, make sure that the terminal section of the board can mate with the connector of the PCI board slot.
  - Insulators are installed between some PCI board slots to protect the PCI boards already installed. Take care not to remove or damage the insulator when installing or removing the PCI board. If the insulator is taken off, reinstall the insulator in place.
- 

1. See the section "Preparing for Installation and Removal" described earlier.

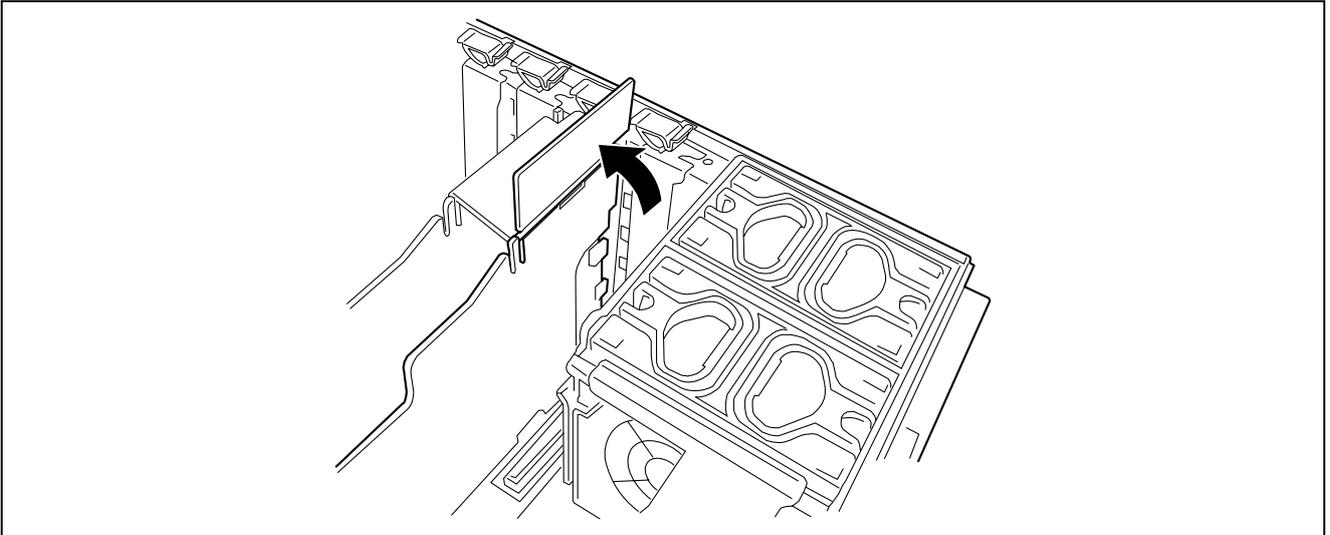
---

**IMPORTANT:** To avoid damage to the system and devices, always turn off the system before installing non-hot swap boards.

---

2. Pull out the server from the rack.
3. Remove the top cover.
4. Locate the slot to install a board.

5. Open the protection plate.

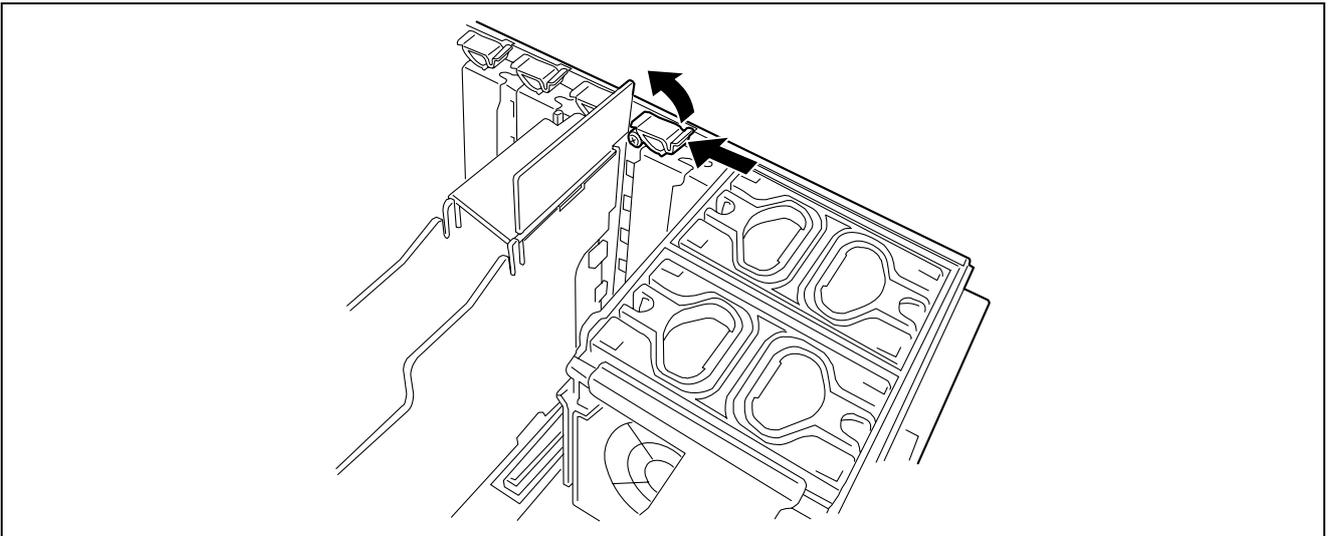


6. Press the tab at the tip of the additional slot cover to unlock and open the tab.

---

**IMPORTANT:** Do not open the retention tab to an angle superior than 90 degrees or more. Doing so could damage the tab.

---

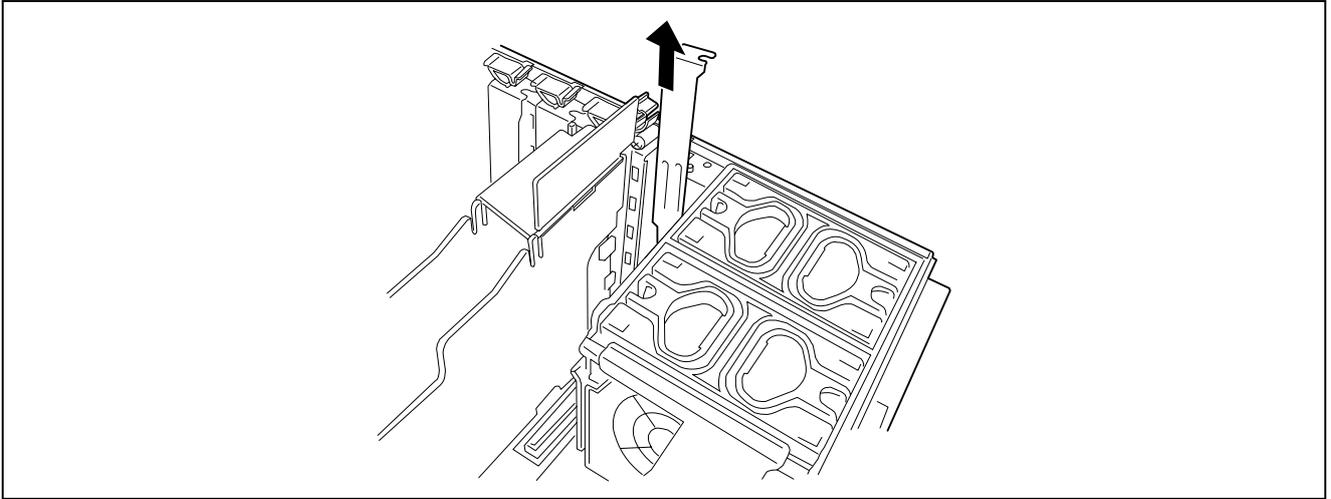


7. Remove the blank plate.

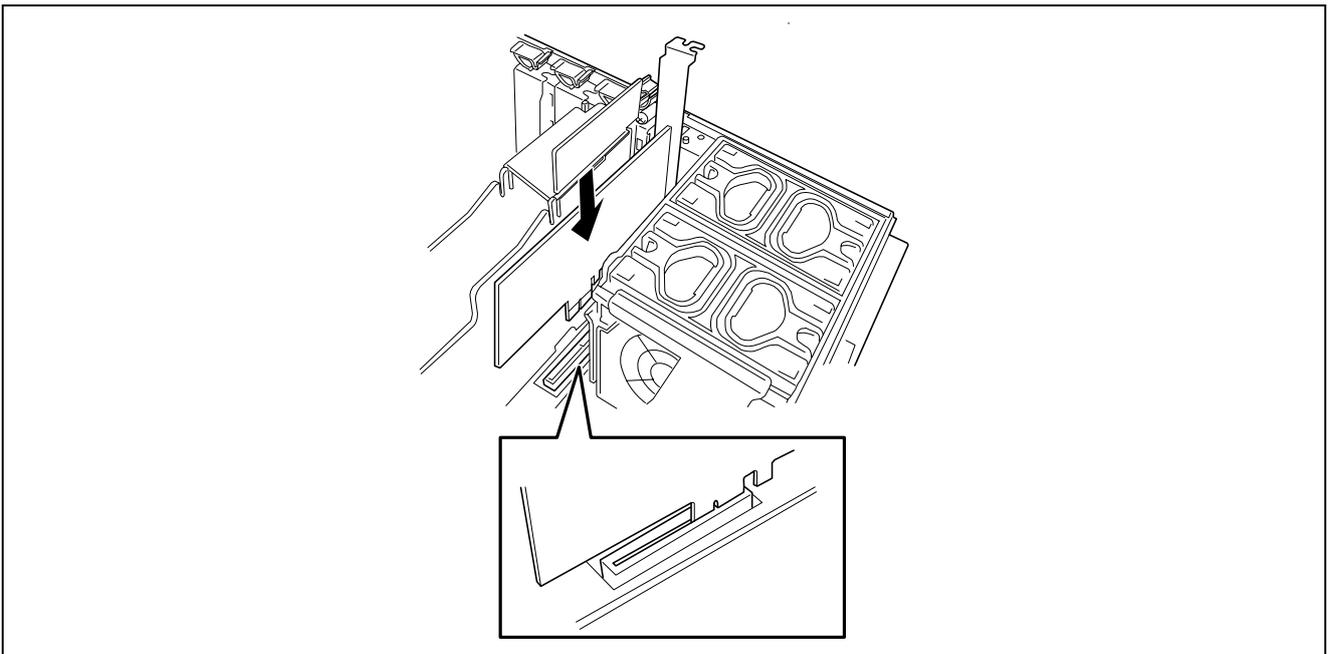
---

**IMPORTANT:** Keep it for future use.

---



8. Carefully push the board until it engages and fully seats in the slot connector.
9. Align the board with the grooves of the guide rail, and insert the board slowly and gently.

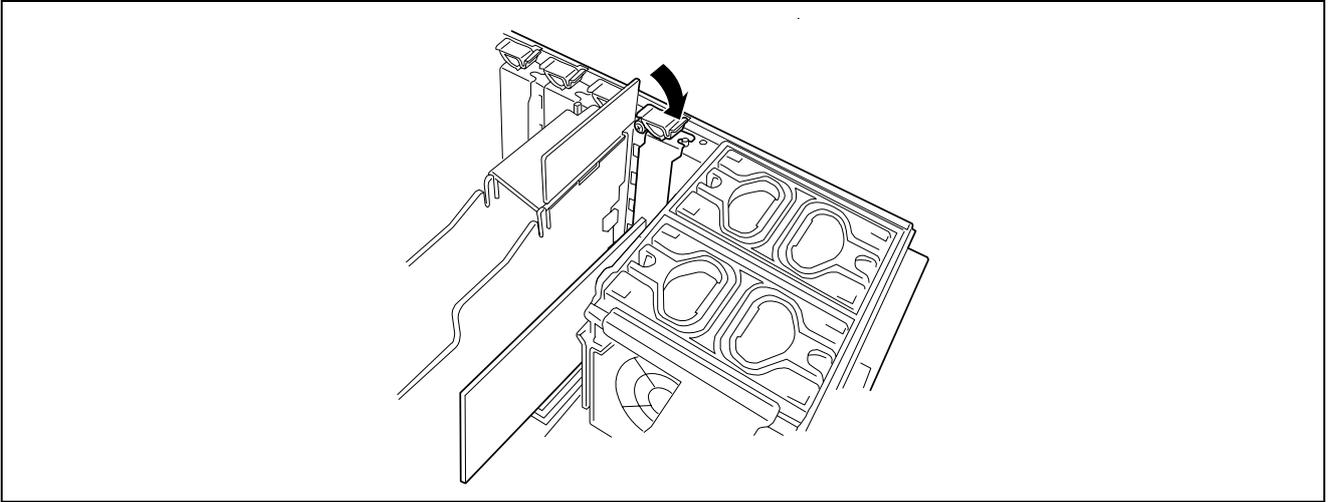


10. Slowly close the tab to secure the PCI board.

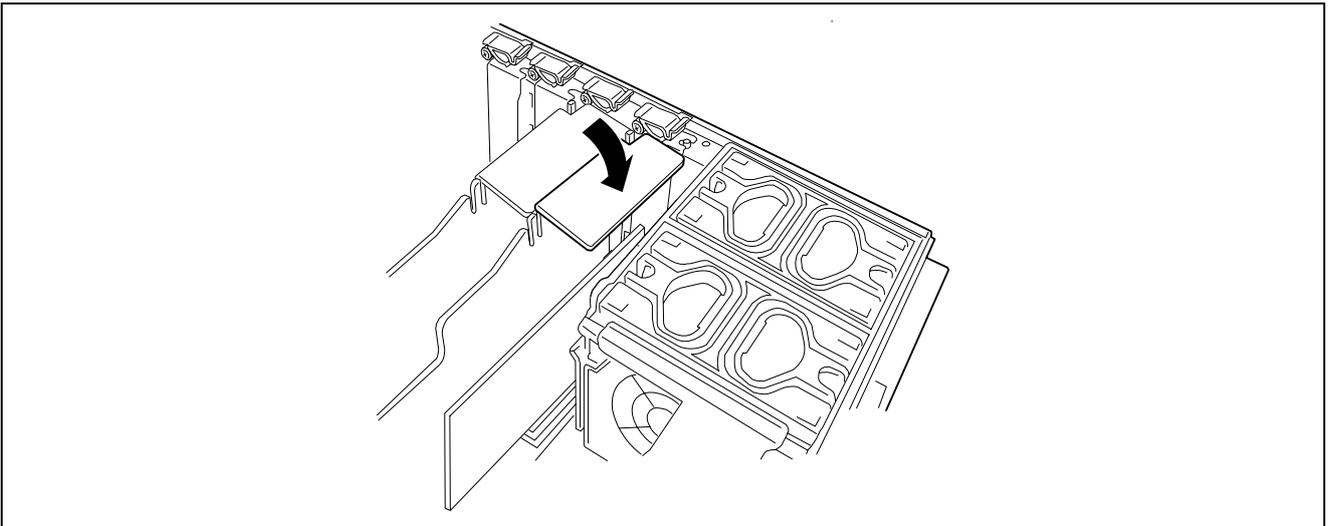
---

**NOTE:** Make sure that the tab is firmly locked. If the tab is unlocked, the PCI board and/or base board may be damaged.

---



11. Close the protection cover.



12. Reinstall the removed components.

- 13.** Power on the server and make sure that no error message appears during POST.  
If an error message appears, write down the message and review the error message list in Chapter 8.
- 14.** Start the BIOS Setup Utility to set the "Reset Configuration Data" in the "Advanced" menu to "Yes."  
This updates the hardware configuration information. See Chapter 4 for details.

## Removal

Remove the board in the reverse procedure of the installation.

## Hot-plug PCI Board

In the PCI board slots #1 and #2, you can replace or add a hot-plug PCI board while the server is operating.

See the "List of Optional Devices and their Available Slots" on page 9-22 to identify the PCI boards supporting the hot-plug function.

The PCI hot-plug function includes the following functions:

- Hot Add  
Use Hot Add to install a Hot Plug PCI board while the server is operating.
- Hot Remove  
Use Hot Remove to remove a Hot Plug PCI board while the server is operating.
- Hot Replace  
Use Hot Replace to replace a Hot Plug PCI board while the server is operating.

---

### **IMPORTANT:**

- Before removing a PCI board, be sure to stop the driver of the slot (containing the PCI board) from the operating system (Windows Server 2003). Failure to do so may cause the system to fail.
  - For Windows Server 2003, do not use a function in inactive state after executing the PCI Hot-plug function. The system will fail to return to the original state.  
Use the BIOS Setup utility to set the following before executing the PCI Hot Plug function:  
Select [Advanced] → [PCI Configuration] → [Hot-plug PCI Control] → [Reserving memory space for PHP] → Select the memory space for the installed board\*<sup>1</sup>.  
\*1 The memory capacity appears to be less than the actually installed memory capacity.
  - To execute the PCI Hot-plug function, be sure to login to the system as Administrator.
-

## Status LEDs

Two LED indicators inside the chassis indicate the status of the hot-plug PCI add-in boards. You can check the indications given by the LEDs on the base board.

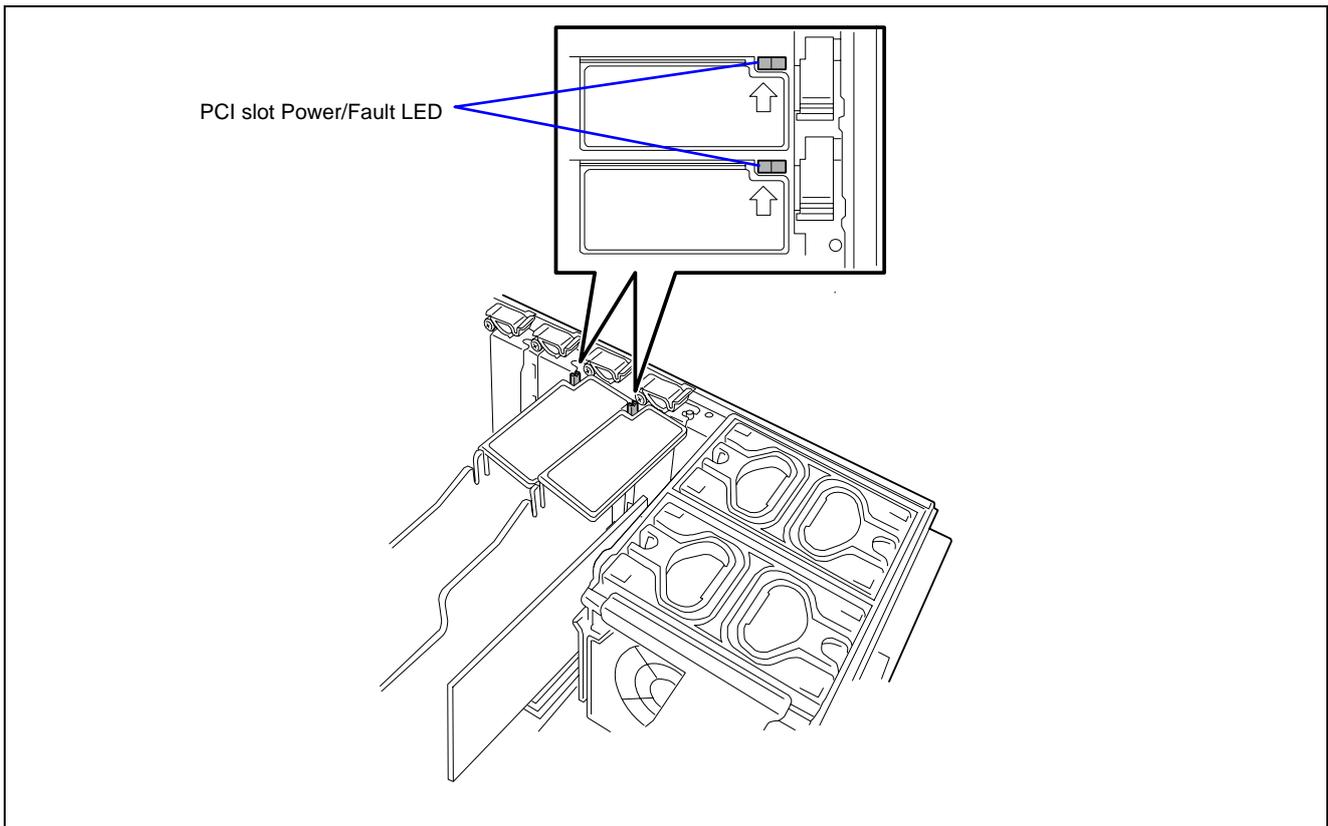
- **PCI slot Power LED (green)**

Lights when power is supplied normally to the PCI board installed.

- **PCI slot Fault LED (amber)**

Lights when an error occurs on the PCI board or the slot containing the PCI board.

Flashes when the driver is stopped from Windows Server 2003 in order to do perform a Hot Remove or Hot Replace.



## Hot Add

Follow the procedure below to execute a Hot Add:

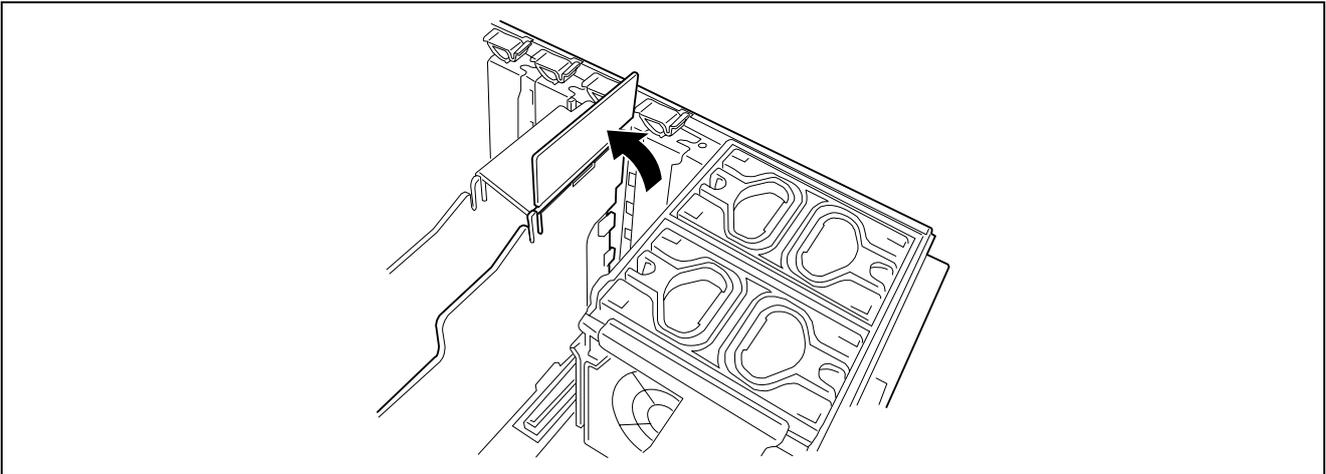
1. Pull out the server from the rack (without powering off the server).
2. Remove the top cover.
3. Locate the slot in which you are going to install an additional board.

---

**NOTE:** Confirm that the PCI Slot Power LED of the slot in which you are going to install the PCI board is off.

---

4. Open the protection plate.

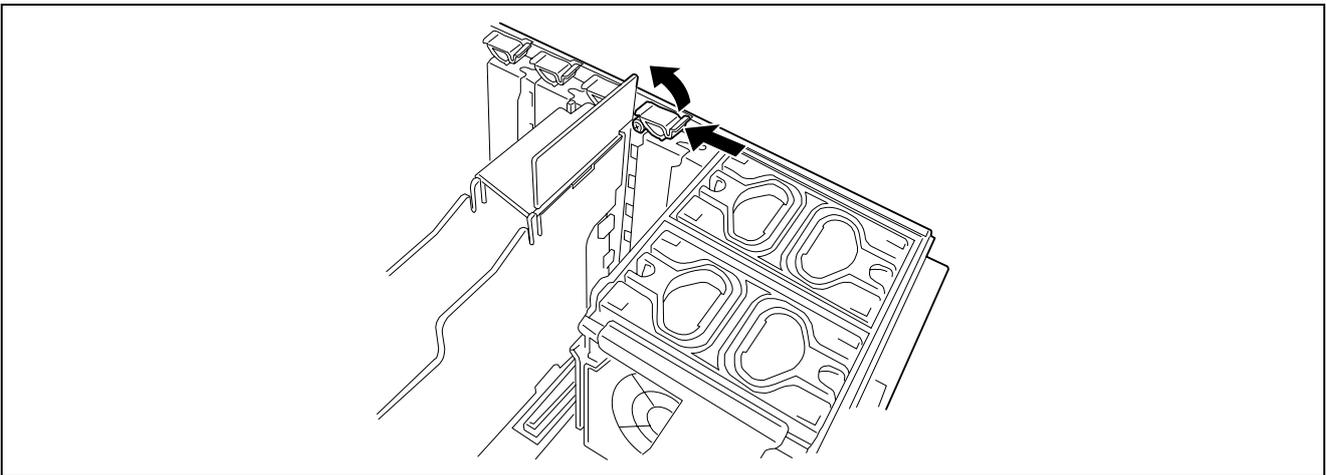


5. Push the tab at the tip of the additional slot cover to unlock the tab. Open the tab.

---

**IMPORTANT:** Do not open the retention tab to an angle of 90 degrees or more. Doing so could damage the tab.

---

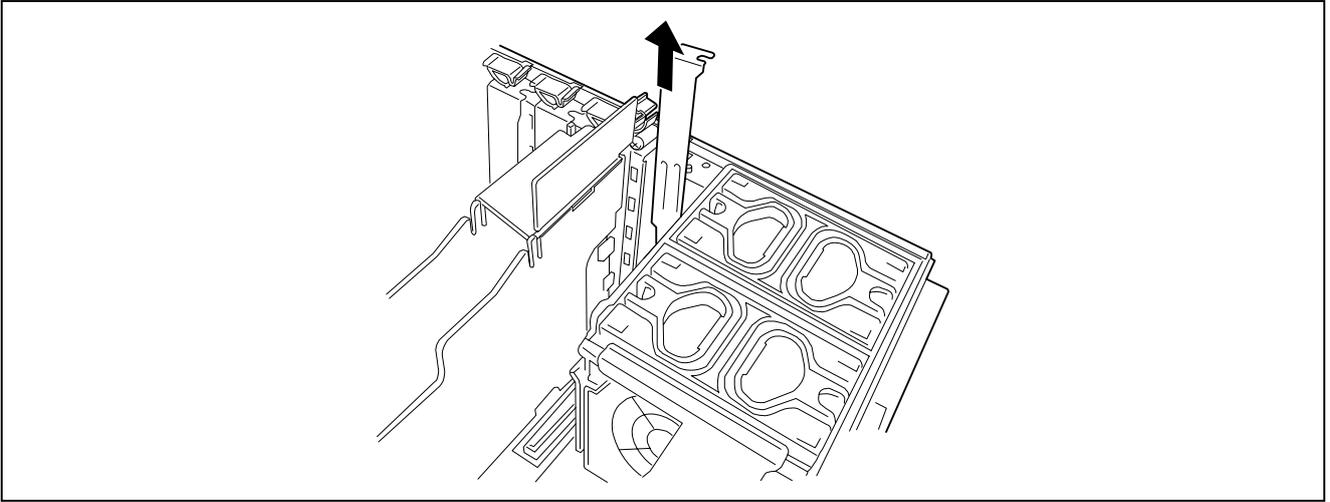


6. Remove the additional slot cover.

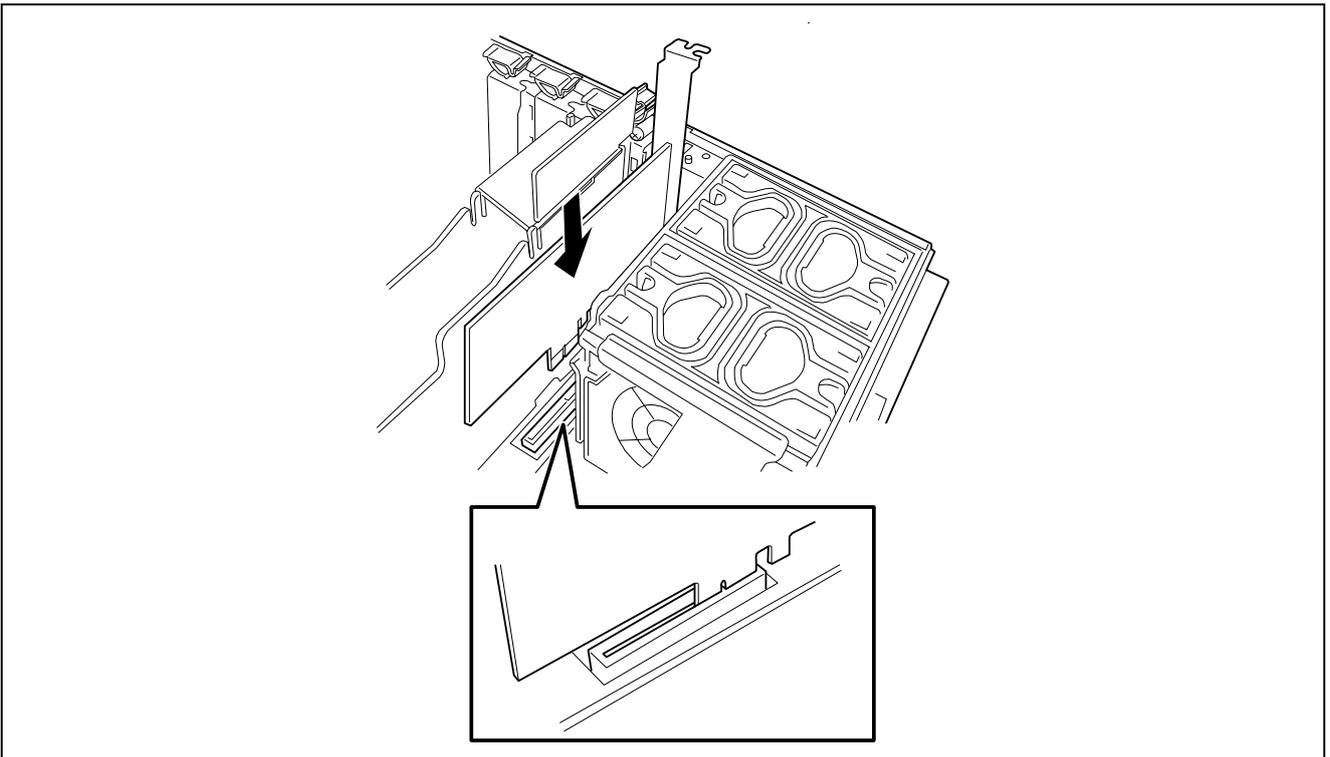
---

**IMPORTANT:** Keep the removed additional slot cover for future use.

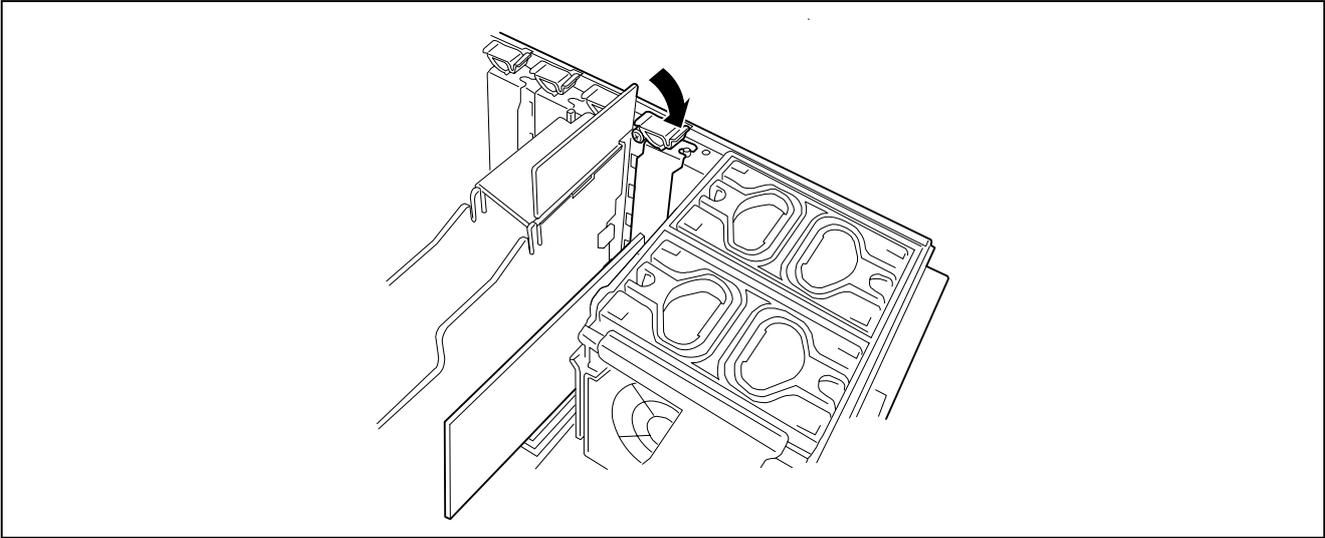
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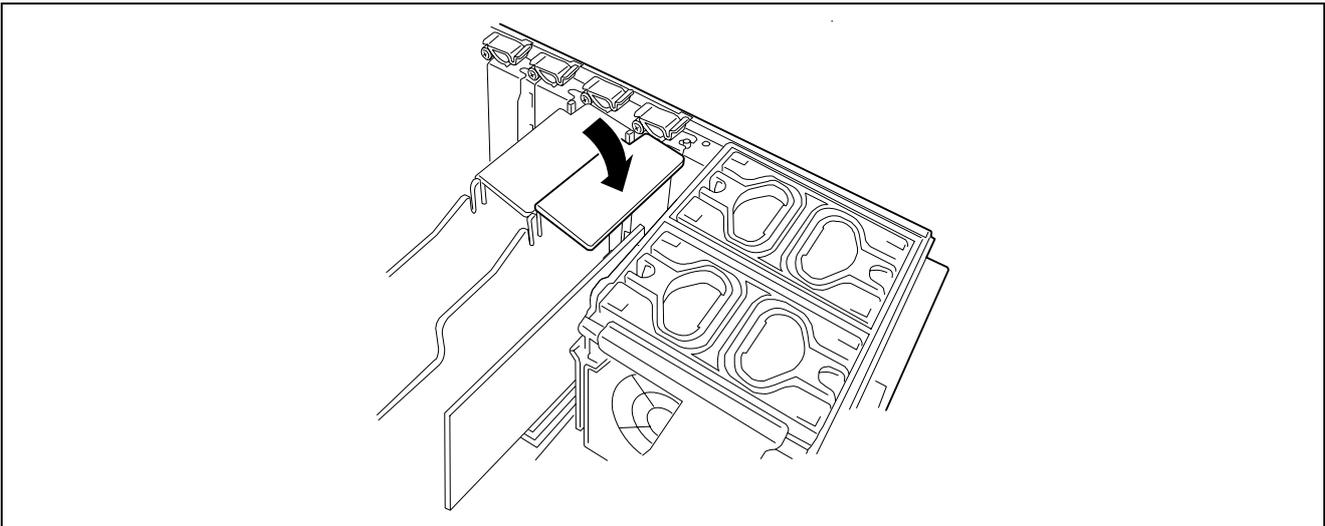
7. Push the PCI board slowly and carefully into the slot.
8. Push the PCI board until the connection part of the board is firmly inserted into the slot.



9. Connect the cables to the PCI board while firmly holding the PCI board with your hand.
10. Slowly close the tab to secure the PCI board.



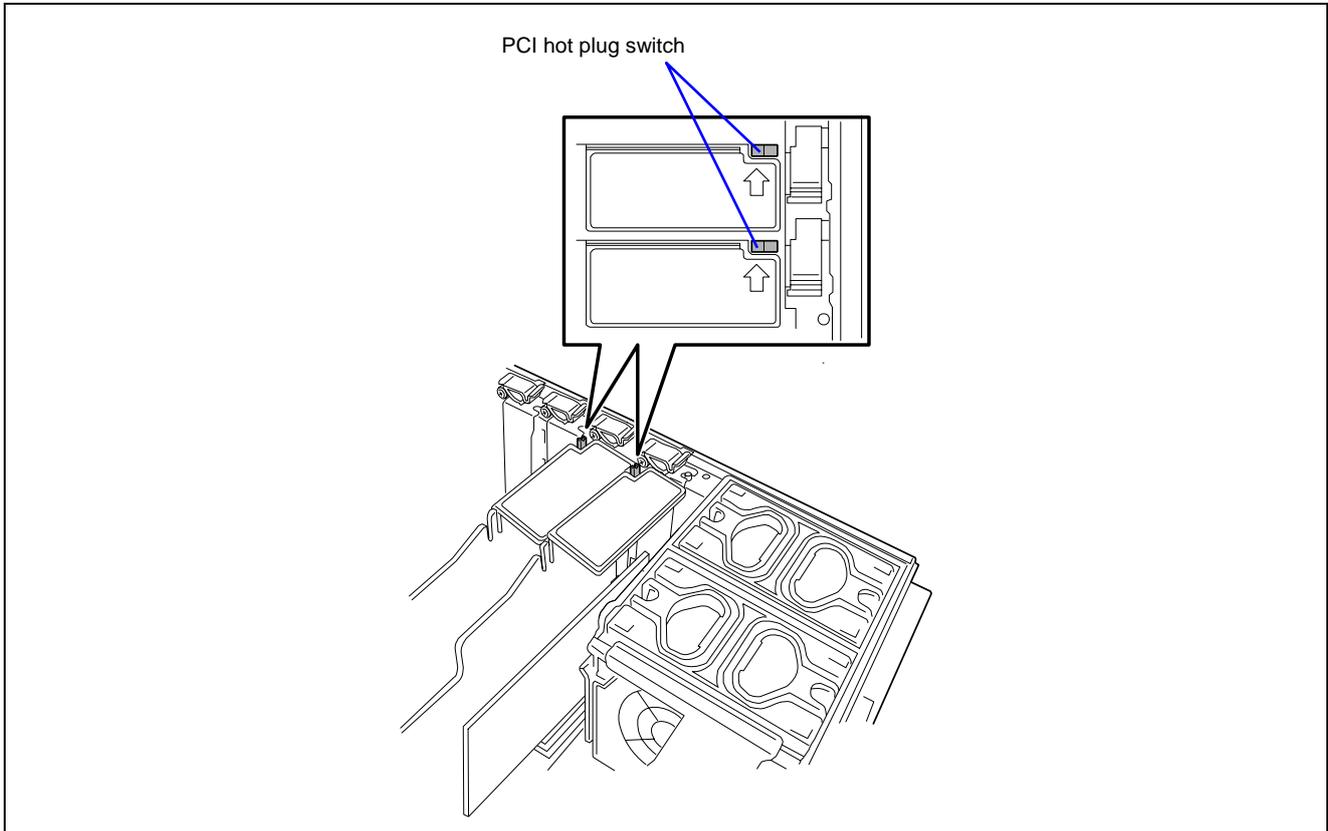
11. Close the protection cover.



12. Press the PCI Hot Plug switch. The PCI Slot Power LED flashes once and then lights steadily.

**NOTES:**

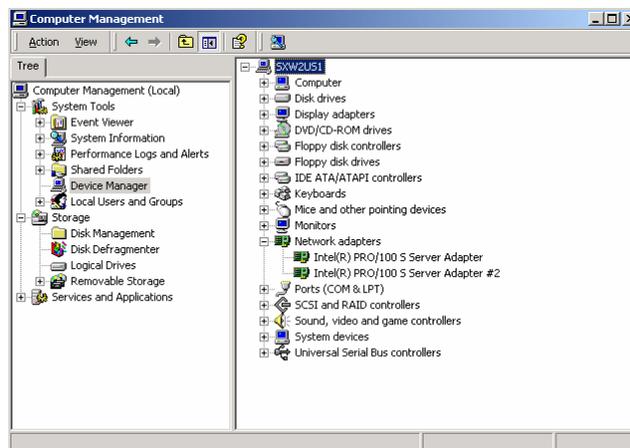
- If the server runs under Windows Server 2003, the operating system automatically recognizes the additionally installed PCI board and installs the driver.
- If an error occurred in the installed board or the slot, the PCI Slot Fault LED lights (amber).



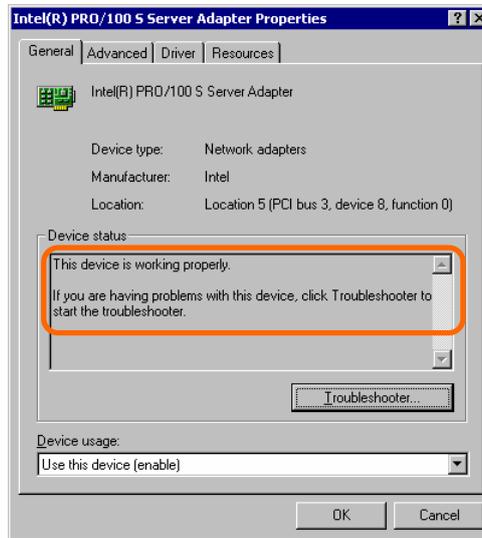
13. Reinstall the top cover and slide the server into the rack.

14. Follow the steps below to check if the additionally installed PCI board is recognized and operating properly:

- (1) Select [Control Panel], [Administrative Tools], [Computer Management], and [Device Manager].
- (2) Move the cursor to the added board.



(3) Click on the [General] tab and confirm that the device is operating normally.



\* Some of the information depends on the location of the PCI board slot.

## Hot Remove

Follow the procedure below to execute a Hot Remove:

1. Take the steps below to stop the device driver used by the Hot-plug PCI board you want to remove:

---

**IMPORTANT:** Before removing a PCI board, be sure to stop the driver of the slot (containing the PCI board) from the operating system interface. Failure to do so may cause the system to fail.

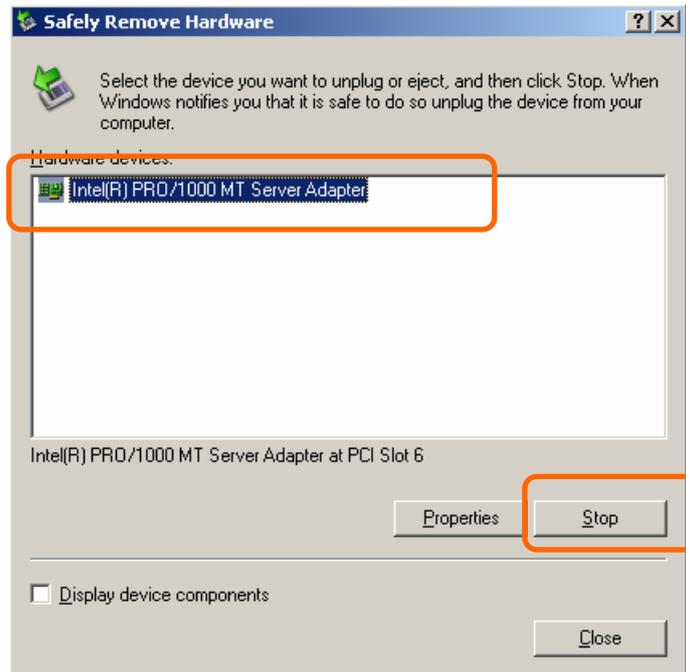
---

- (1) Double click the [Safety Remove Hardware] icon at the lower right side of the display. The following window is displayed.



\*The message in "Hardware devices:" depends on the location of the PCI board slot and of the number of PCI boards installed.

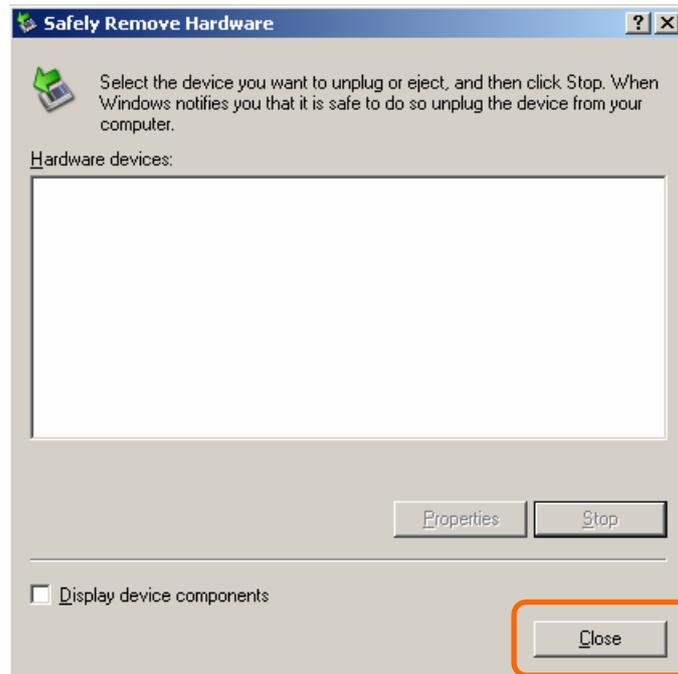
(2) Select the target device, and click on [Stop].



(3) Confirm it is the driver used by the device you want to remove, and click on [OK].



- (4) Click on [Close].



- (5) Pull out the server from the rack (without powering off).
- (6) Remove the top cover and locate the board to be removed.

---

**NOTE:** Confirm that the PCI Slot Power LED of the target PCI slot is off.

---

To stop the device driver using the PCI hot-plug switch:

- (1) Pull out the server from the rack (without powering off).
- (2) Remove the top cover and identify the PCI board to remove.
- (3) Press the PCI hot-plug switch on the slot from which the PCI board is to be removed.

---

**NOTE:** Confirm that the PCI Slot Power LED of the target PCI slot is off.

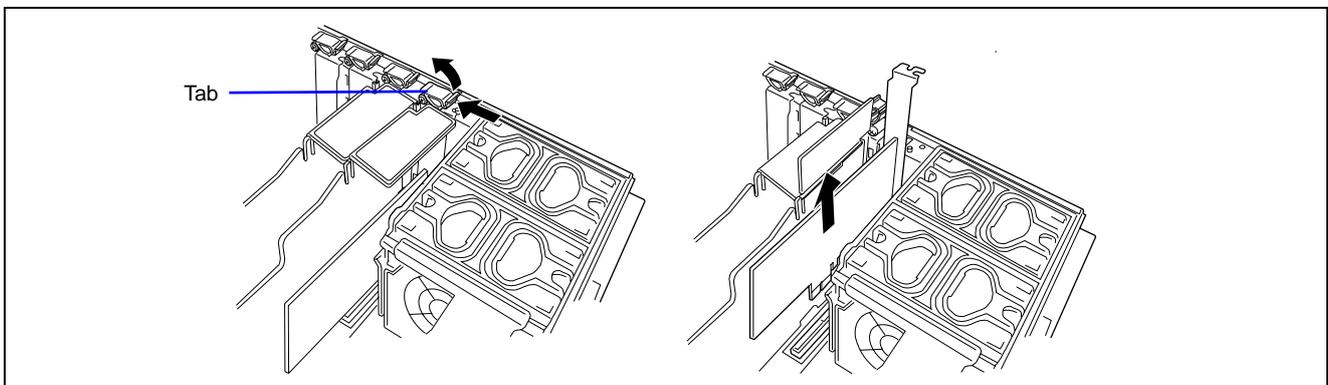
---

2. Disconnect all the cables from the PCI board.
3. Push the tab to unlock it, slowly open the tab, and remove the PCI board.

---

**IMPORTANT:** Do not open the retention tab to an angle of 90 degrees or more. Doing so could damage the tab.

---

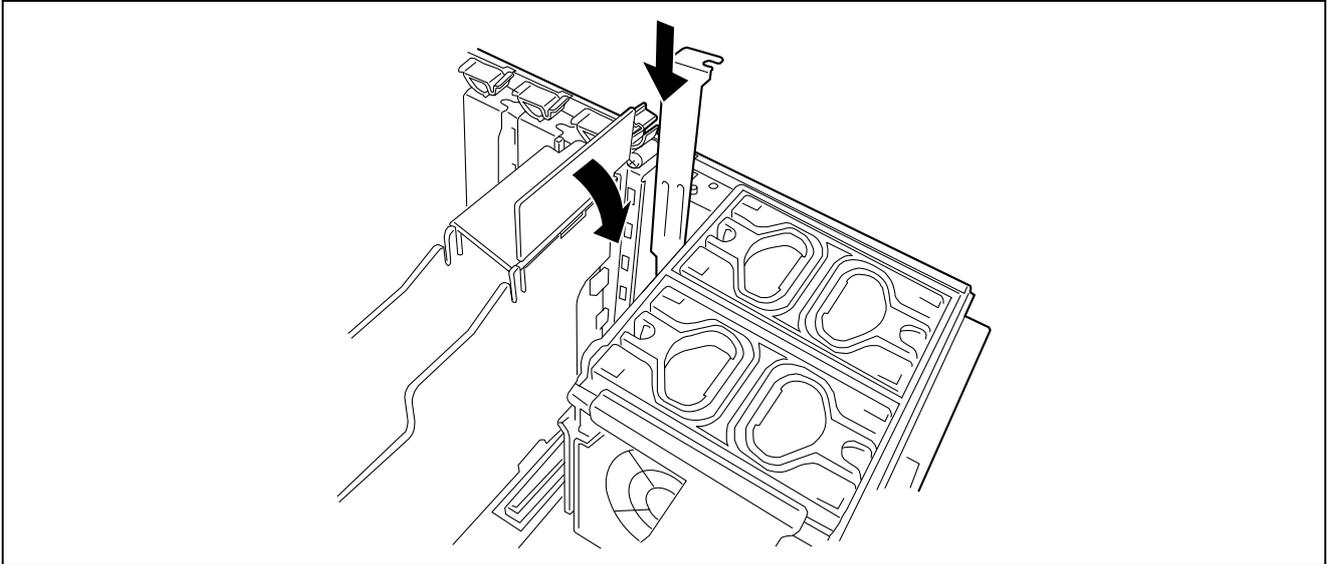


4. Install the additional slot cover on the slot from which you want to remove the PCI board, then slowly close the tab.

---

**IMPORTANT:** To maintain the dust-proofing, electromagnetic radiation characteristics and cooling performance of the server, be sure to install a blank plate on the slot from which you removed the PCI board.

---



5. Reinstall the top cover and slide the server into the rack.

## Hot Replace

Follow the procedure below to execute a Hot Replace:

1. Follow the steps below to stop the device driver used by the Hot Plug PCI board you want to replace:

---

**IMPORTANT:** Before removing a PCI board, be sure to stop the driver of the slot (containing the PCI board) from the operating system interface. Failure to do so may cause the system to fail.

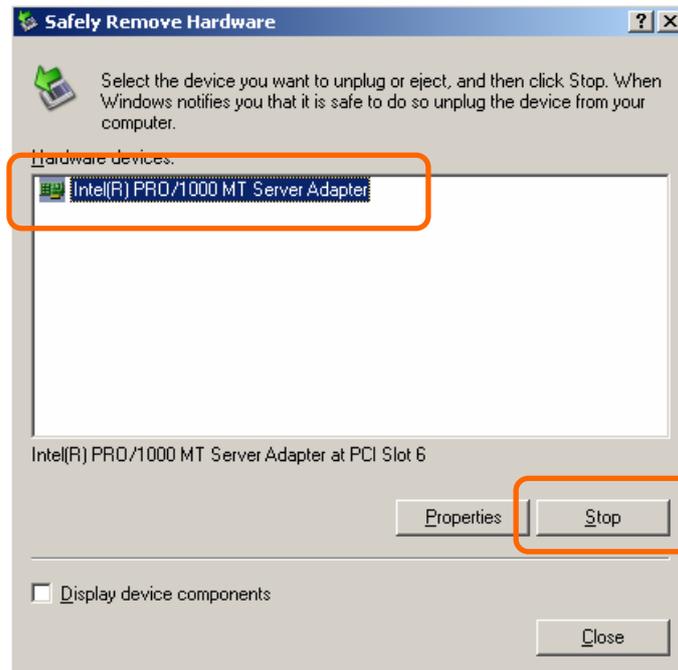
---

- (1) Double click the [Safely Remove Hardware] icon at the lower right side of the display. The following window is displayed.



- \* The message in "Hardware devices:" depends on the location of the PCI board slot and on the number of PCI boards installed.

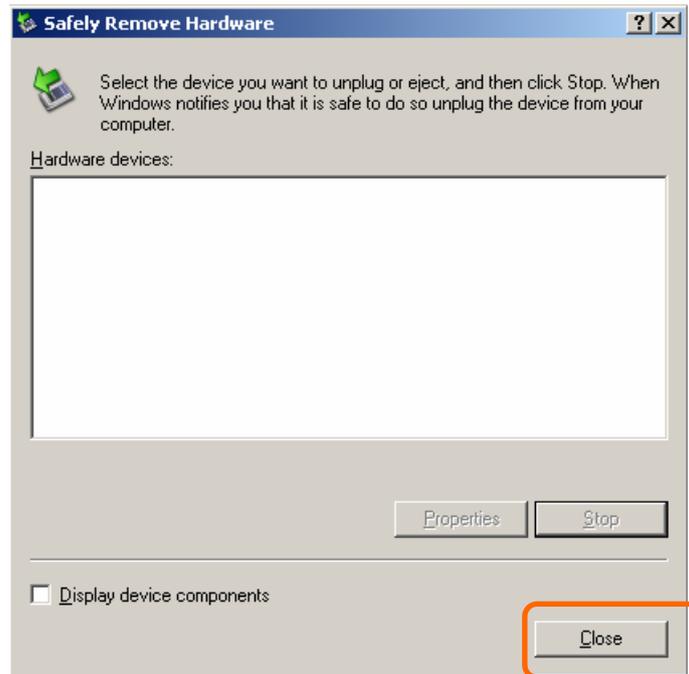
(2) Select the target device, and click on [Stop].



(3) Confirm it is the driver used by the device you want to remove, and click on [OK].



- (4) Click on [Close].



- (5) Pull out the server from the rack (without powering off).
- (6) Remove the top cover and locate the board to be removed.

---

**NOTE:** Confirm that the PCI Slot Power LED of the target PCI slot is off.

---

To stop the device driver using the PCI hot-plug switch:

- (1) Pull out the server from the rack (without powering off).
- (2) Remove the top cover and identify the PCI board to remove.
- (3) Press the PCI hot-plug switch on the slot from which the PCI board is to be removed.

---

**NOTE:** Confirm that the PCI Slot Power LED of the target PCI slot is off.

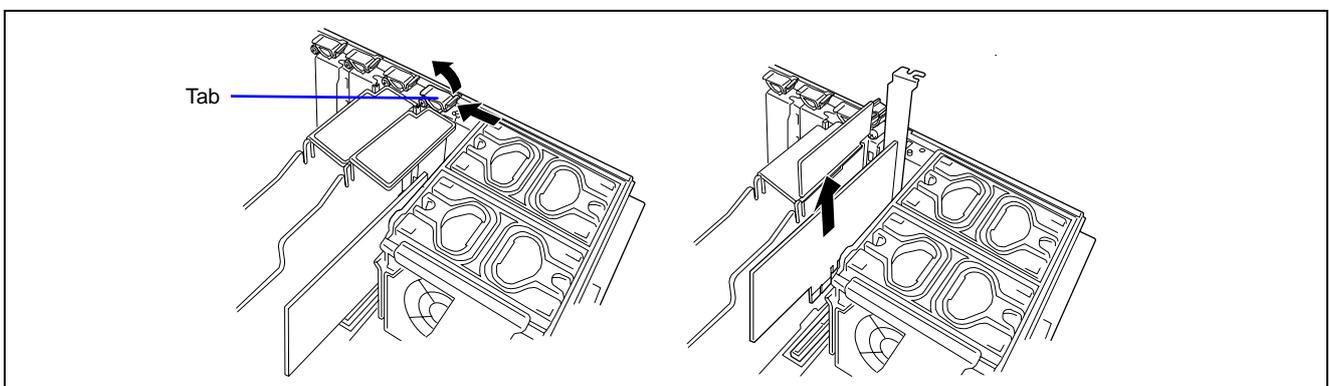
---

2. Disconnect all the cables from the PCI board.
3. Push the tab to unlock it, slowly open the tab, and remove the PCI board.

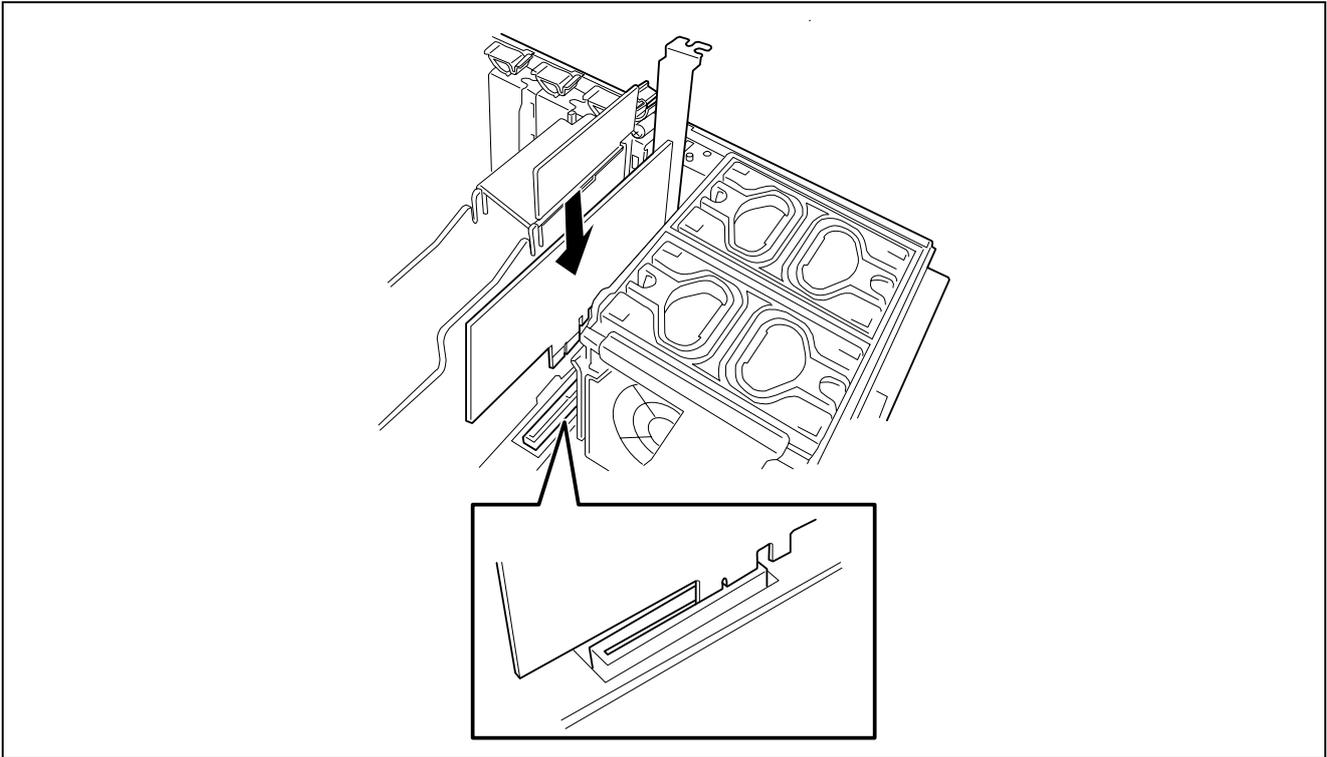
---

**IMPORTANT:** Do not open the retention tab to an angle of 90 degrees or more. Doing so could damage the tab.

---



4. Slowly insert the PCI board into the server.



Push the PCI board until the connection part of the board is firmly inserted into the slot.

---

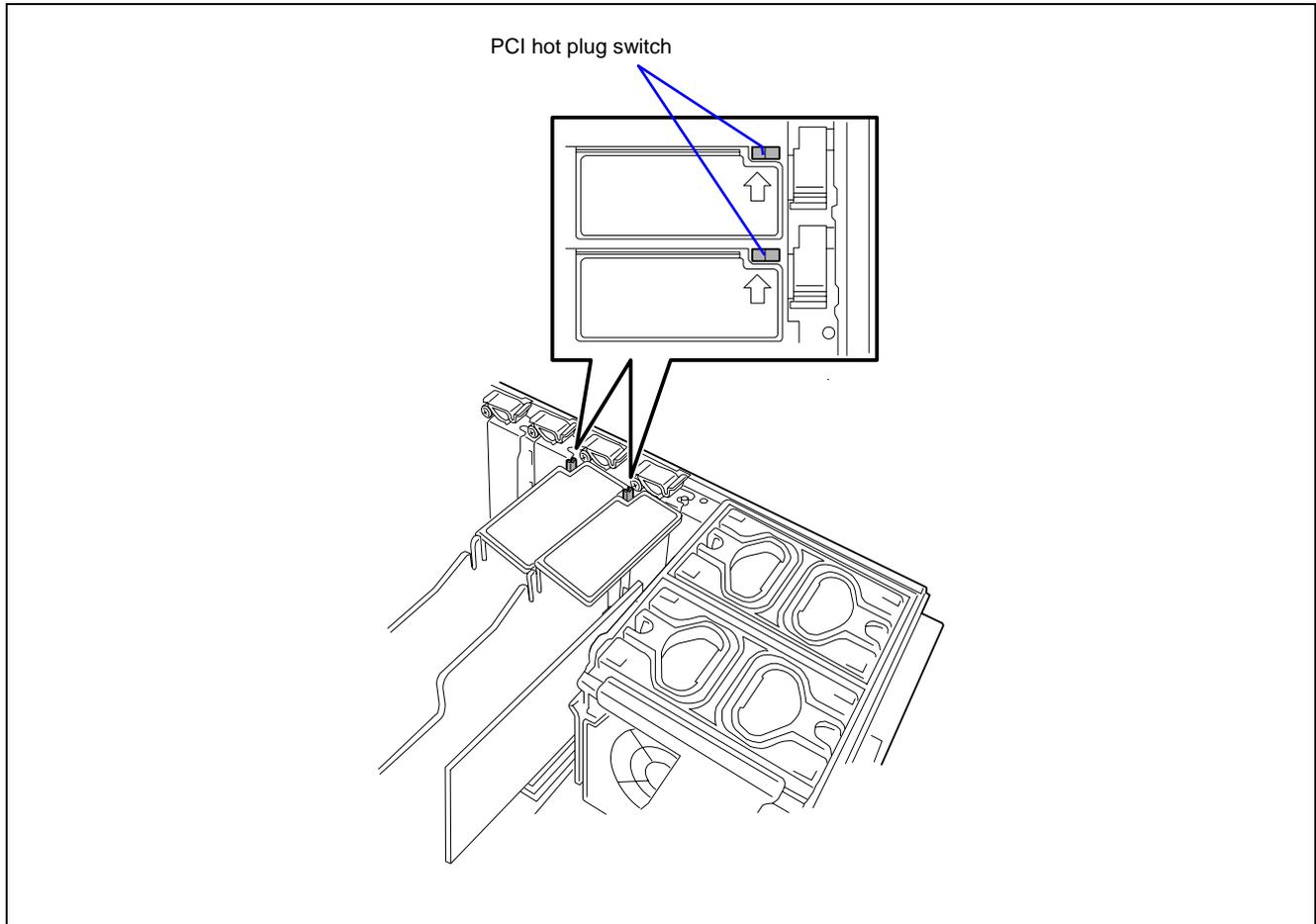
**IMPORTANT:** If failing to install the PCI board correctly, reinstall it. Be careful not to apply excess force to the PCI board when handling it, it could cause damage to the PCI board.

---

5. Connect the cables to the PCI board while firmly holding the PCI board with your hand.
7. Slowly close the tab to secure the PCI board.

8. Press the PCI hot plug switch.

The PCI Slot Power LED flashes once and then lights steady.



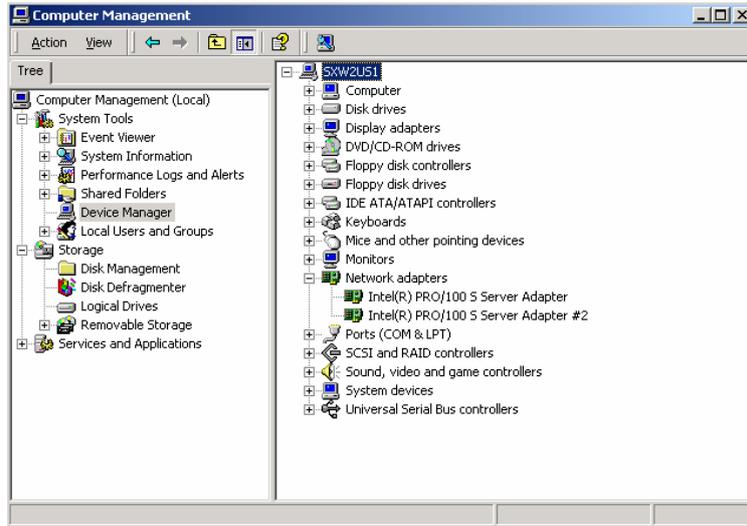
---

**NOTES:**

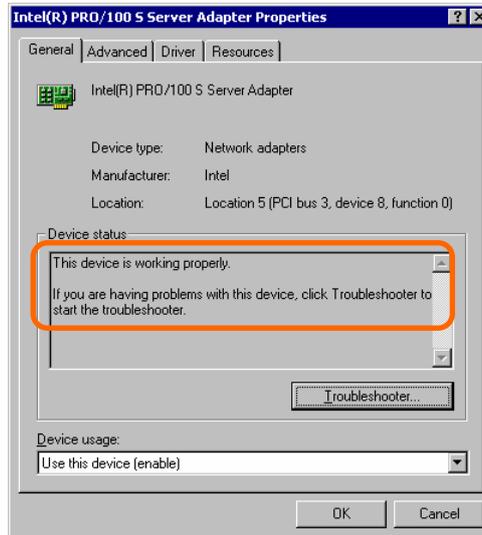
- If the server runs under Windows Server 2003, the operating system automatically recognizes the additionally installed PCI board and installs the driver.
- If an error occurred in the installed board or slot, the PCI Slot Fault LED lights (amber).

9. Reinstall the PCI slot cover and slide the server into the rack.
10. Follow the steps below to check if the additionally installed PCI board is recognized and operating properly:
  - (1) Select [Control Panel], [Administrative Tools], [Computer Management], and [Device Manager] in the order to start the Device Manager.

(2) Move the cursor to the added board.



(3) Click on the [General] tab and confirm that the device is operating normally.



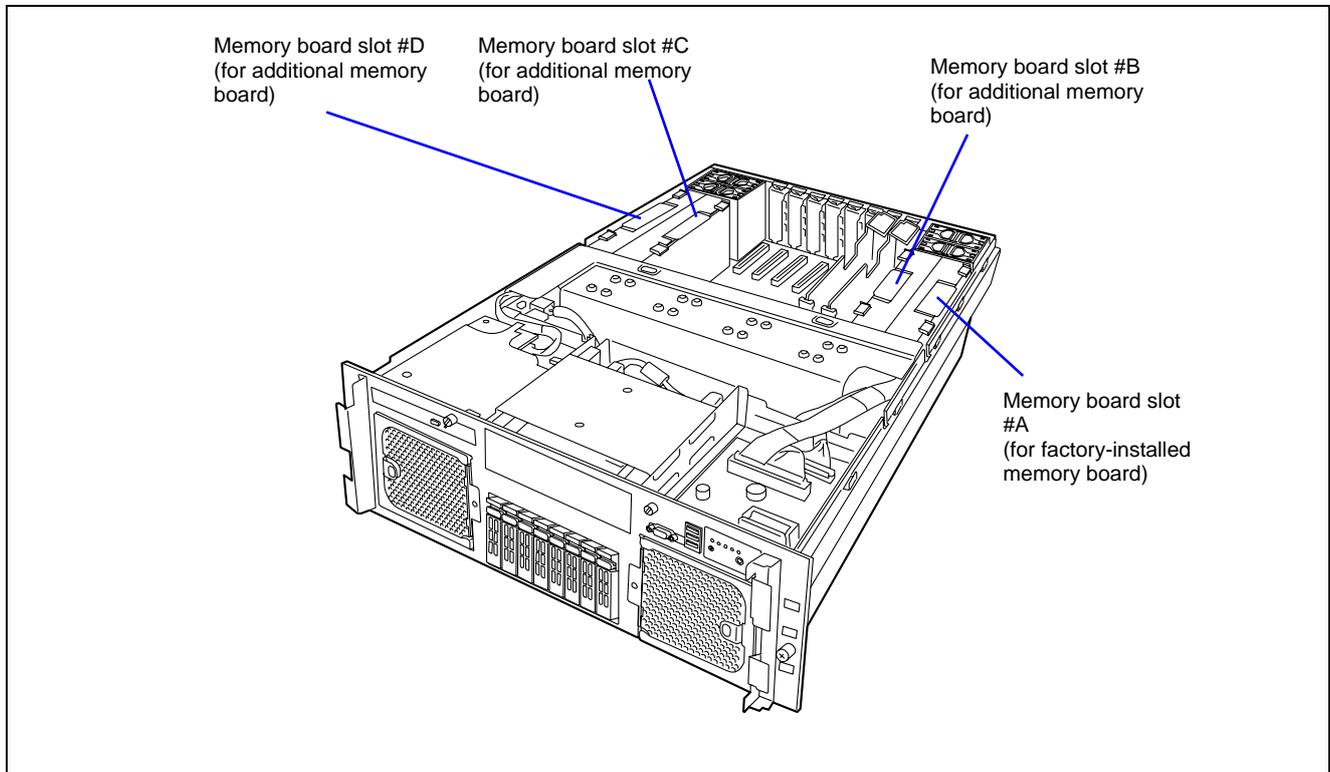
\* Some of the information depends on the location of the PCI board slot.

---

## Memory Board

To install or remove a DIMM, you must first remove the memory board.

One memory board is factory-installed in the server. A single memory board can contain up to eight DIMMs (32GB max.). Up to four memory boards (128GB max.) can be installed in the server.



---

**NOTE:** Install memory boards in that order: #A, #B, #C, and then #D.

To install a memory board in slot #C, you must install another one in slot #D at the same time.

---

## Removal

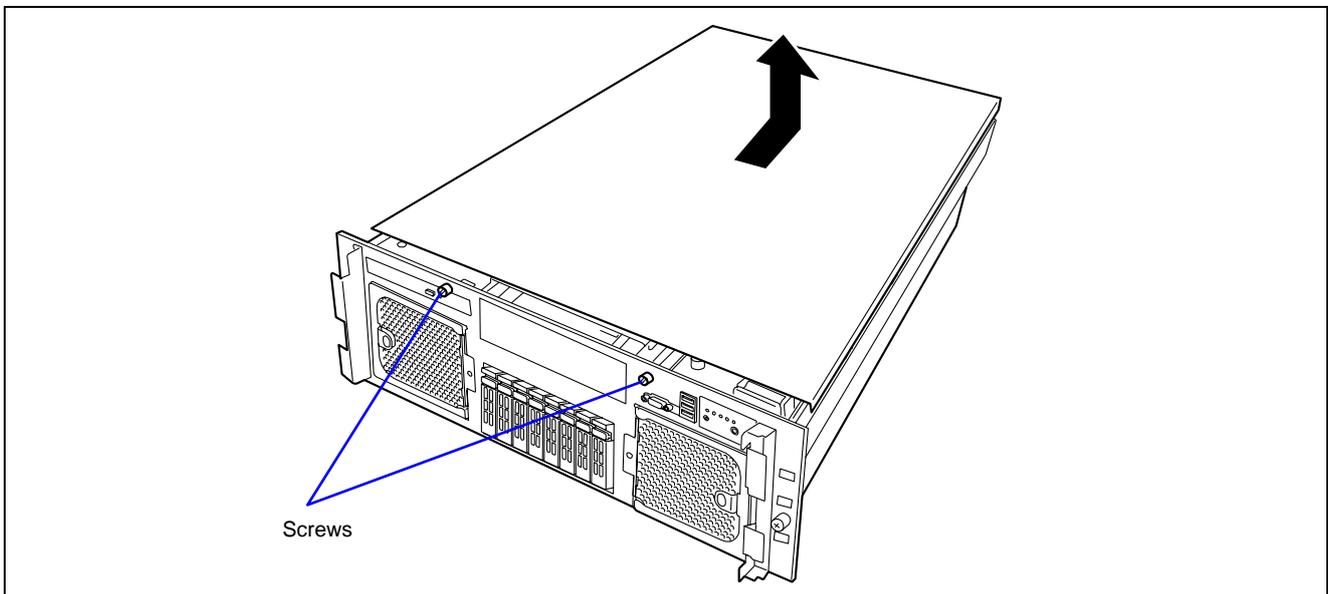
Remove the memory board as described in the following procedure.

---

**IMPORTANT:**

- The memory 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 memory board. Do not touch the memory board terminals or on-board parts with your fingers or place the memory board directly on the desk. For more information on static electricity, refer to the "Anti-static Measures" section.
  - The memory board is very hot when in use. To remove the board, power off the server and wait for several minutes before pulling it out.
- 

1. See the section "Preparing for Installation and Removal" described earlier.
2. Unlock the front bezel using the security key, and remove the front bezel.
3. Remove the two screws, and remove the top cover of the server.



4. Unlock the memory board to open the ejector.

---

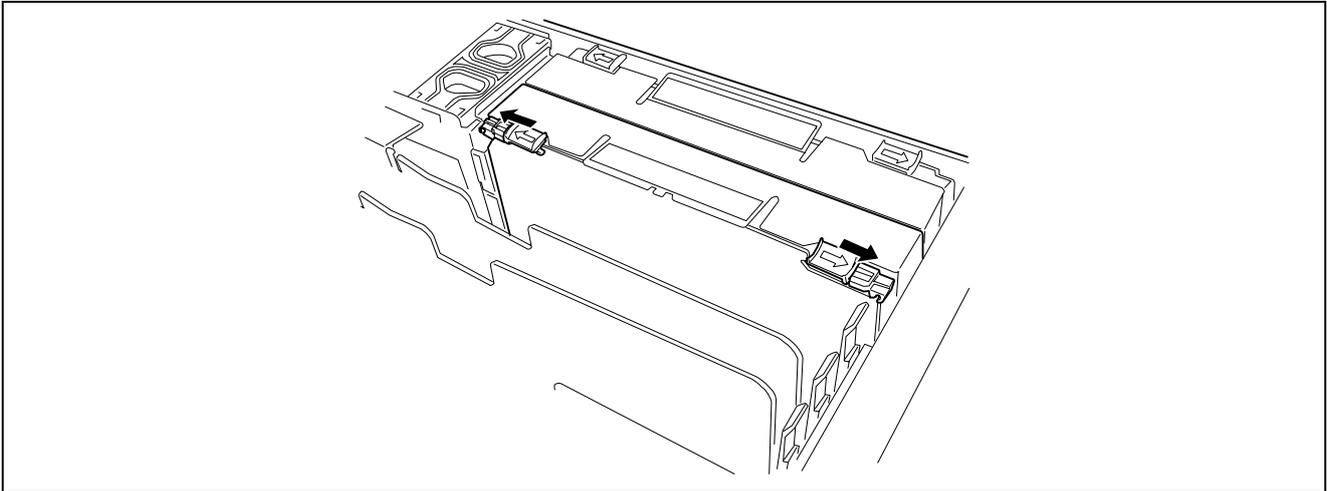
**IMPORTANT:** The memory board is very hot when in use. To remove the board, power off the server and wait for several minutes before pulling it out.

---

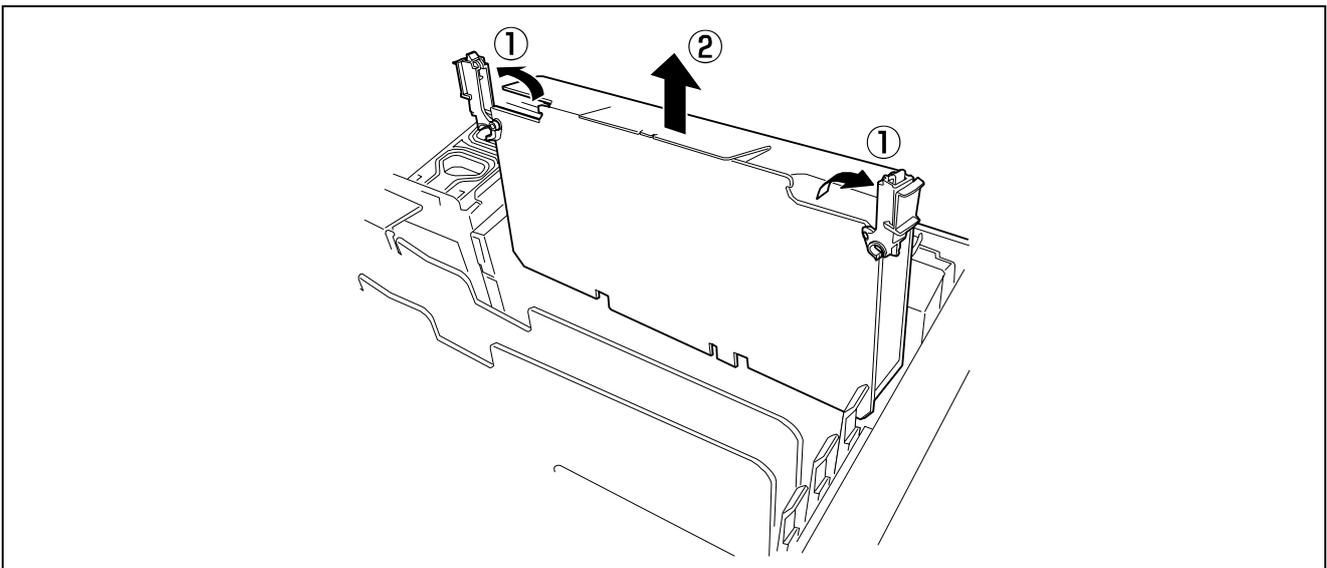
---

**NOTE:** Be sure to open both sides of ejector at the same time.

---



5. Hold the ejector and pull the memory board out of the server.



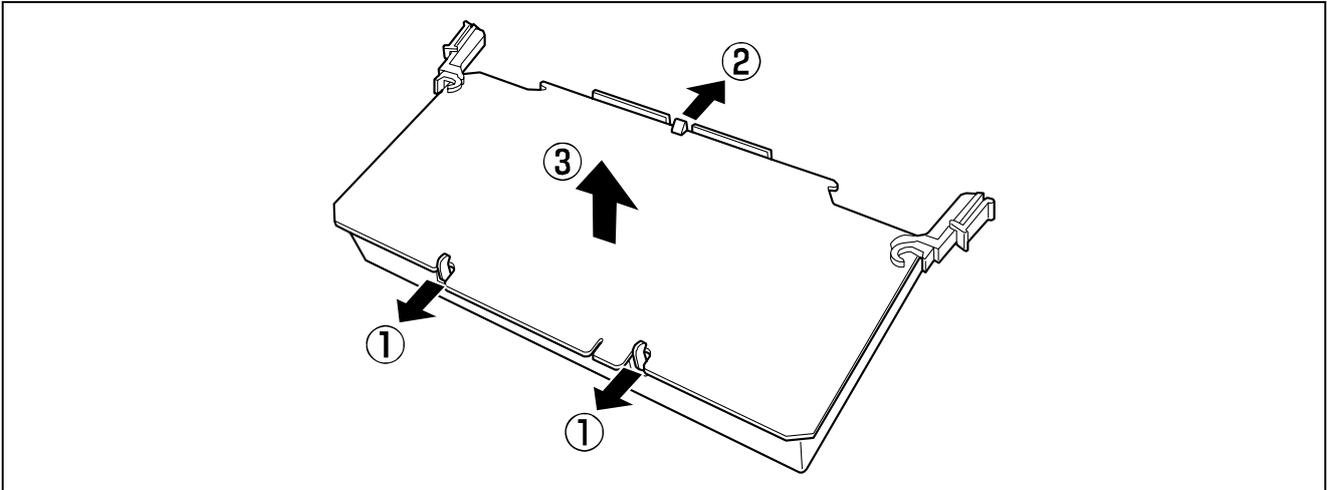
---

**IMPORTANT:** The memory board can be heavy if several DIMMs are installed. When handling the memory board, securely hold the ejector and be careful not to drop the board.

---

**6.** Remove the DIMM cover.

Disengage the lower two hooks at the rear of the memory board.



---

**IMPORTANT:** Make sure not to touch the edge of the card (connector pins). Doing so may cause a contact failure.

---

**7.** Put the memory board on a dry, clean, and static-free place.

## Installation

Install the memory board in reverse order of the removal steps.

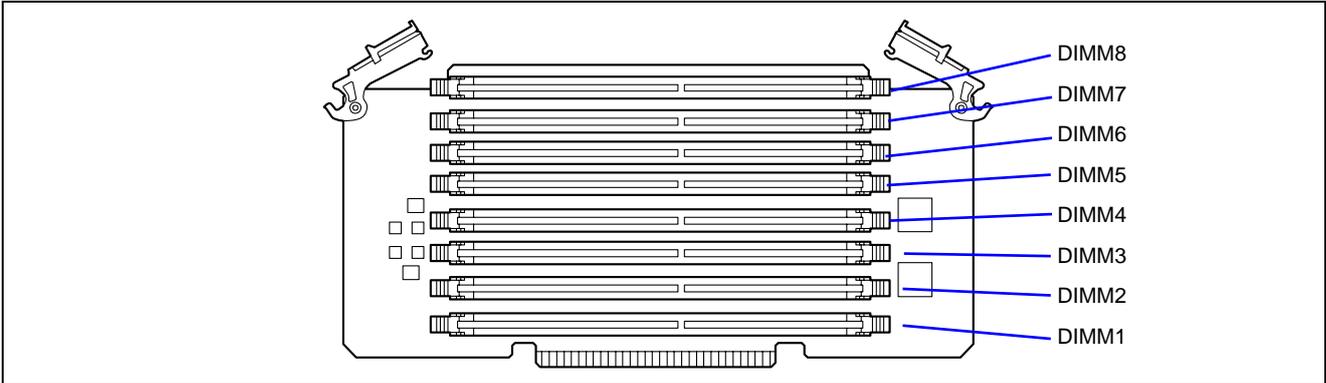
## DIMM

Install the additional DIMM (Dual Inline Memory Module) to the DIMM socket on the memory board in the server.

The DIMMs must be populated in pair.

There are strict installation rules depending on the number of memory boards installed in the server.

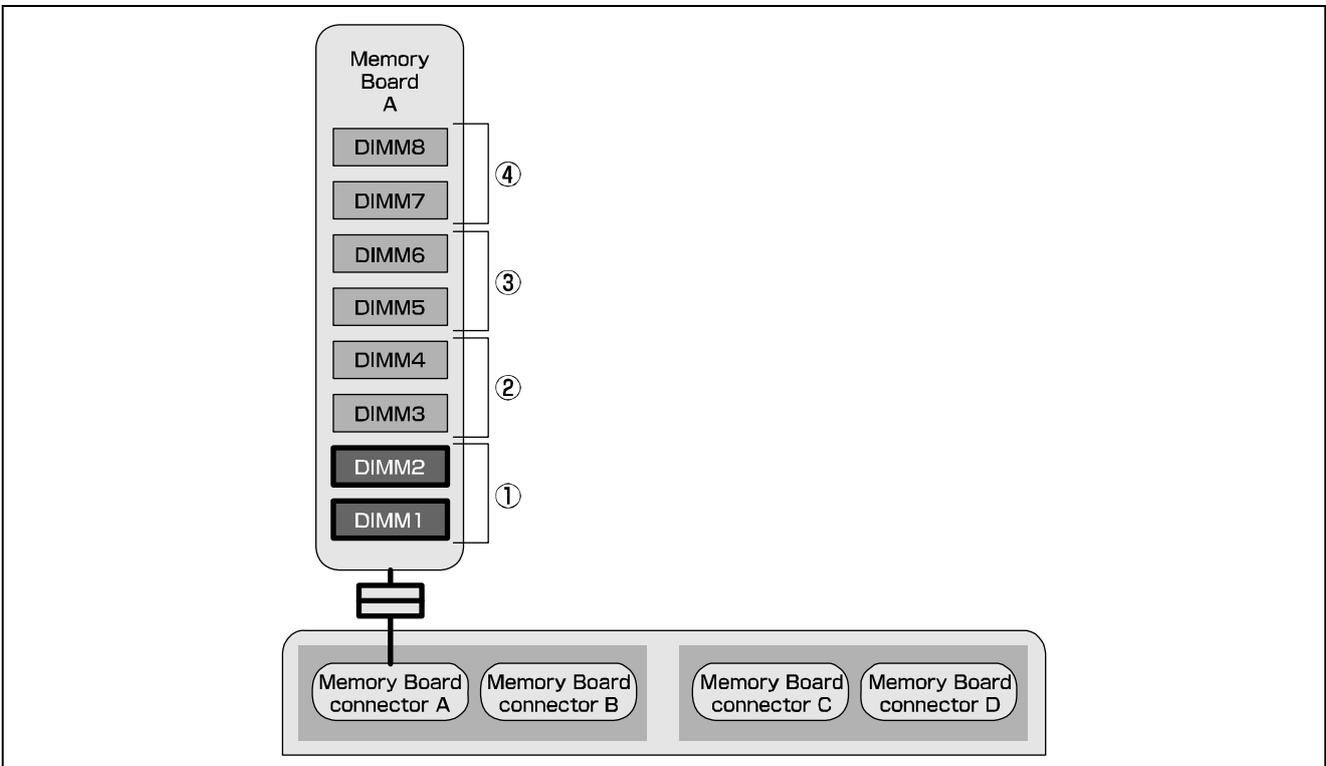
**NOTE:** Up to 32GB of memory (4GB DIMM × 8) can be installed per memory board.



**IMPORTANT:** Two DIMMs installed as a pair must have the same size and capacity. If the DIMMs are incorrectly installed, the system will fail to start.

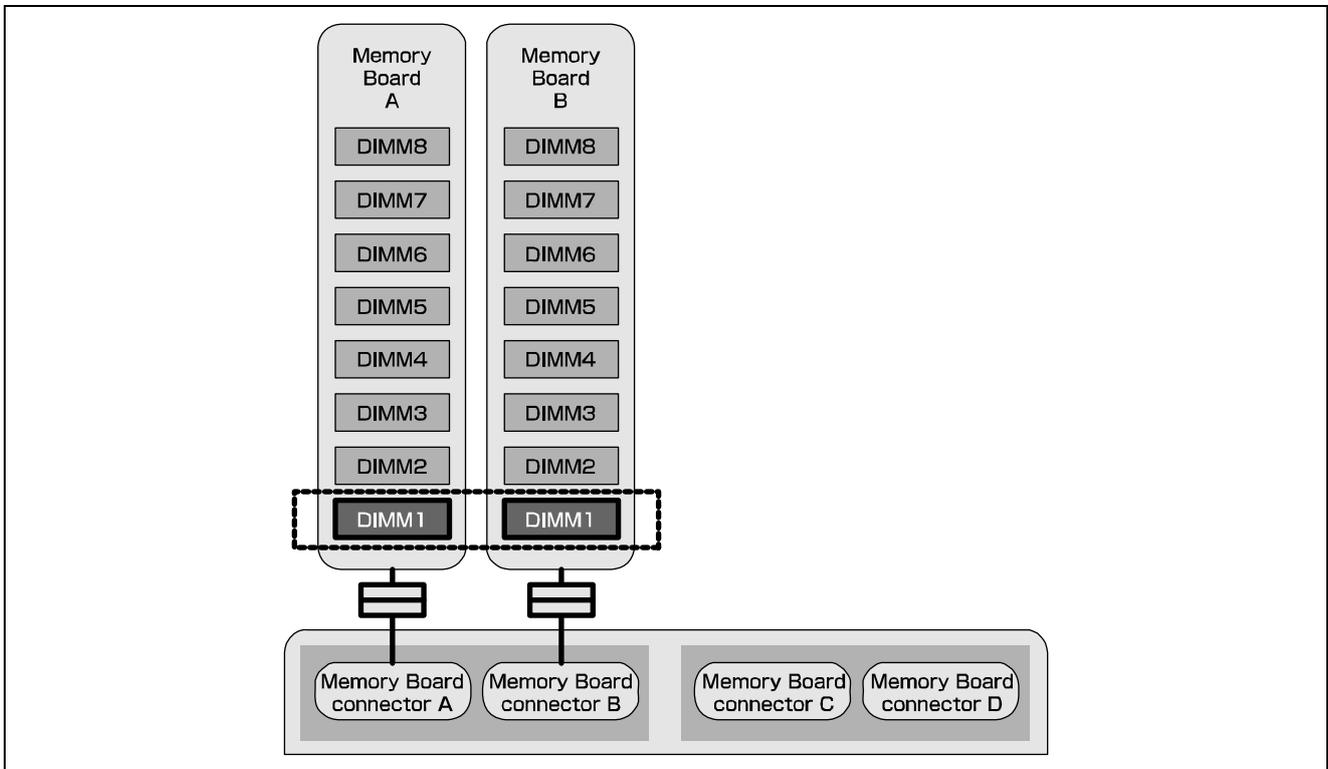
### With a single memory board installed

Install DIMMs (a pair of two) in two slots (starting with the smallest number).



## With two memory boards installed

- Install two DIMMs of the same size and capacity in slots with identical numbers of each memory board.
- Install DIMMs (a pair of two) in the slots (starting with the smallest number) of each memory board.



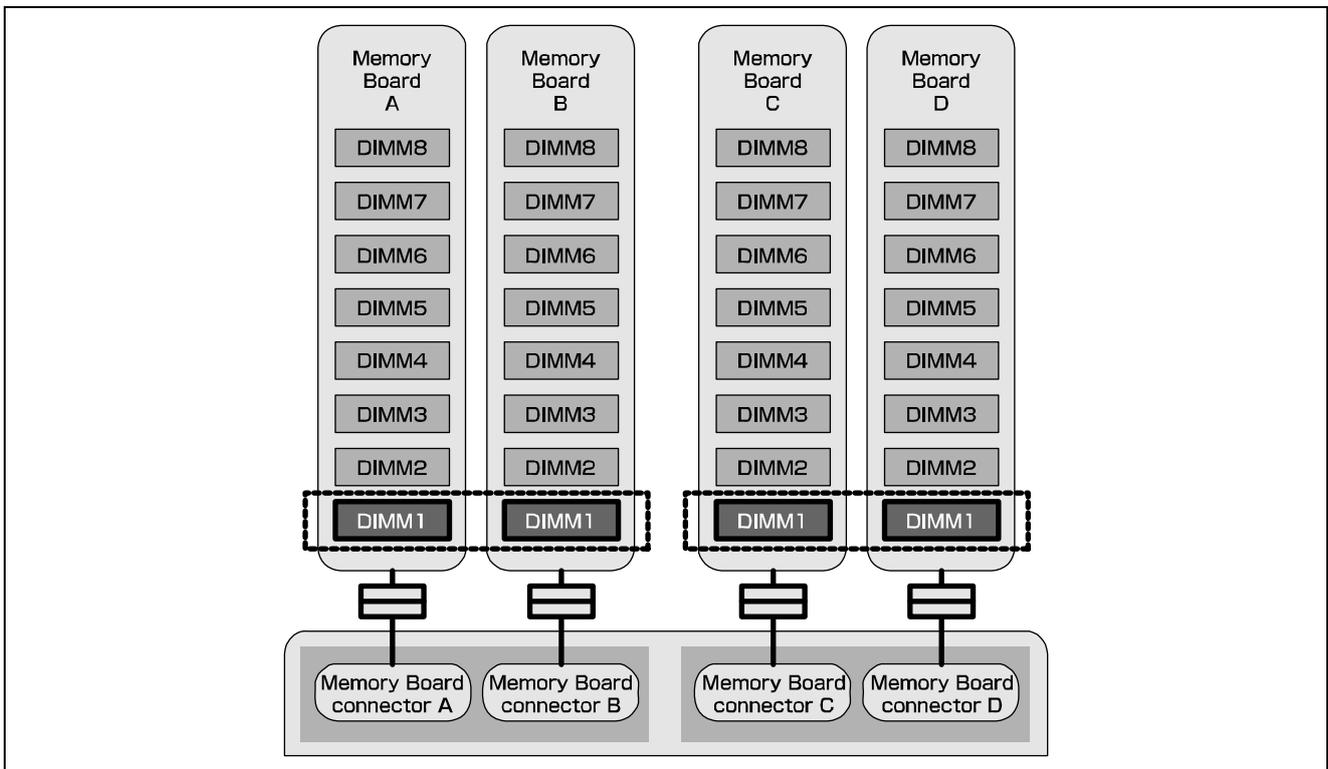
## With four memory boards installed

- Install two DIMMs of the same size and capacity in slots with identical numbers of each memory board #A and #B. Install another two DIMMs of the same size and capacity in slots with identical numbers of each memory board #C and #D.
- Install DIMMs (a pair of two) in the slots (starting with the smallest number) of each memory board.

---

### NOTES:

- To enable the memory mirroring feature, the configuration of the memory boards #A and #B, or #C and #D must be identical.
  - To enable the memory chipkill feature, two or four memory boards are required.
- 



## Installation

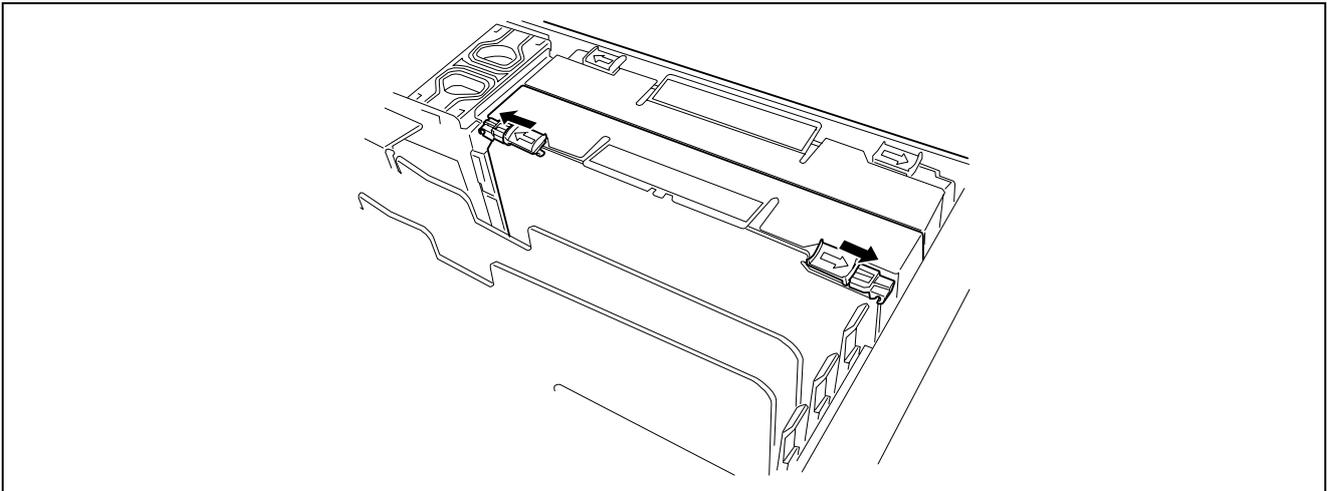
Install a DIMM as described in the following procedure.

---

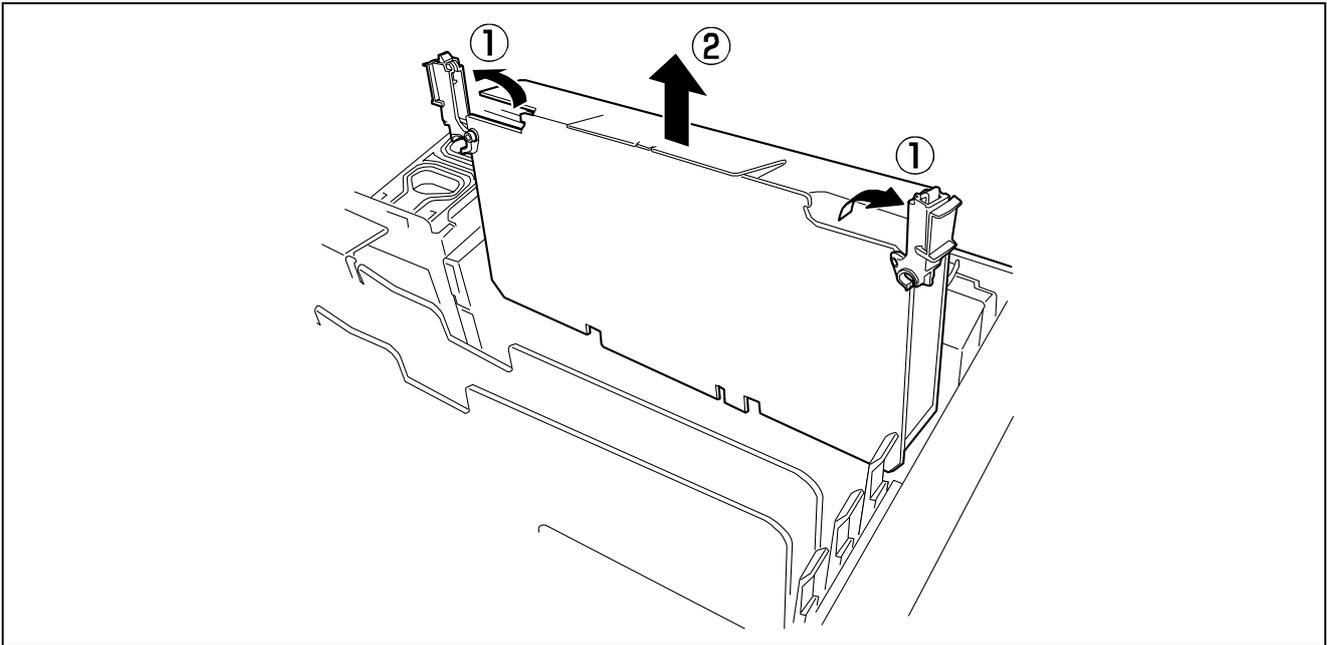
### IMPORTANT:

- 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 with your fingers or place the DIMM directly on the desk. For more information on static electricity, refer to the "Anti-static Measures" section.
  - Make sure to use DIMM authorized by the manufacturer. 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 resulting from the installation of such a board will be charged.
  - Install two additional DIMMs for each group because the server uses interleaved memory. If DIMMs of different specifications are installed in a group, the server does not operate normally.
  - Be sure to install a blank cover to a vacant slot to preserve the cooling effect of the server.
- 

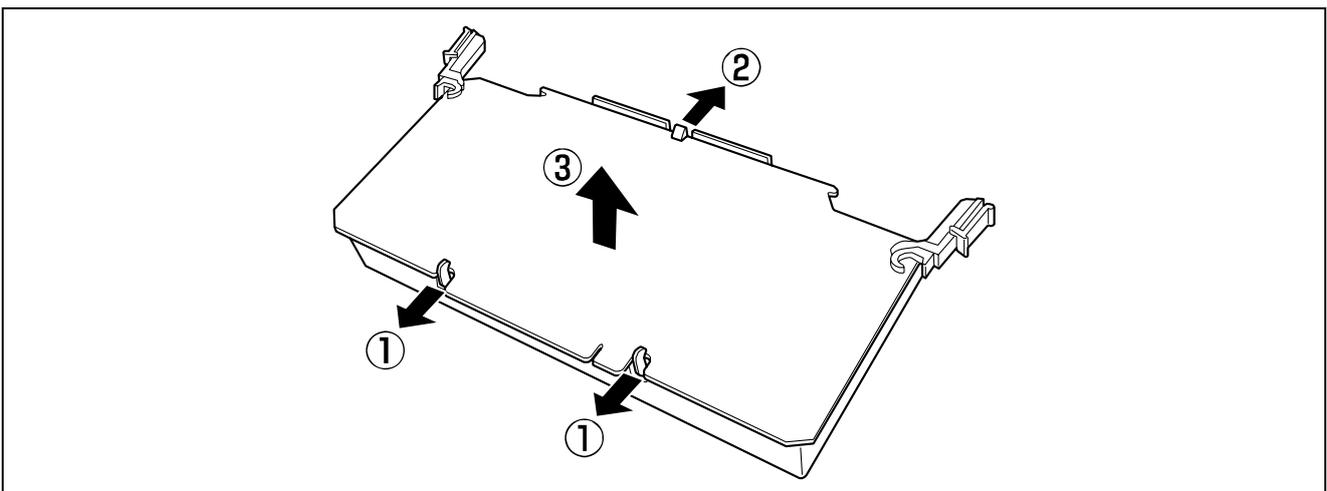
1. See the section "Preparing for Installation and Removal" described earlier.
2. Unlock the front bezel using the security key, and remove the front bezel.
3. Remove the memory board according to "Memory Board" described earlier.
4. Pull the tabs at both ends of the DIMM unit to unlock it.



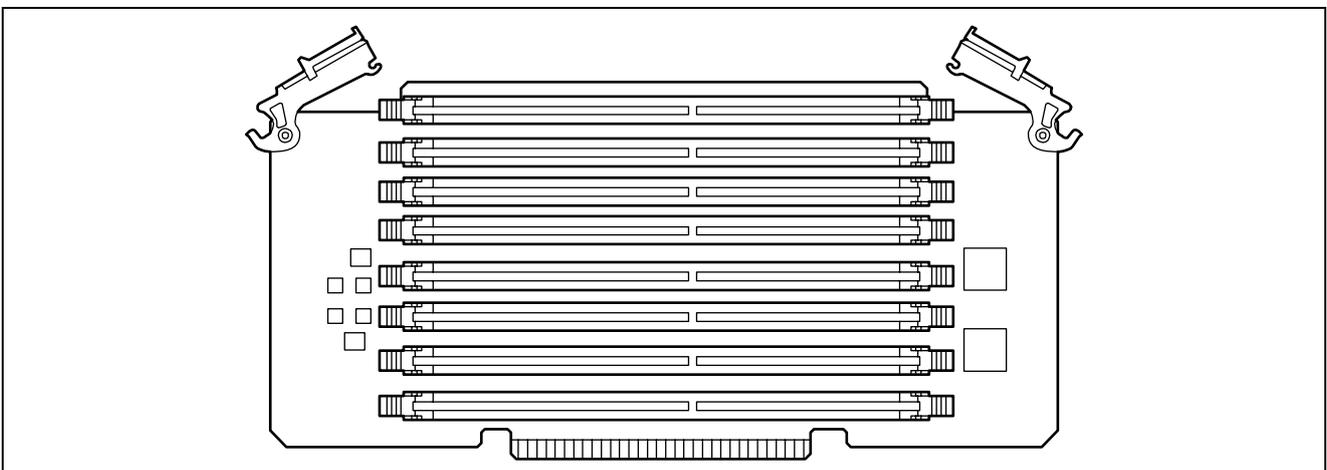
5. Open the locking levers, and pull the DIMM unit upward to remove it.



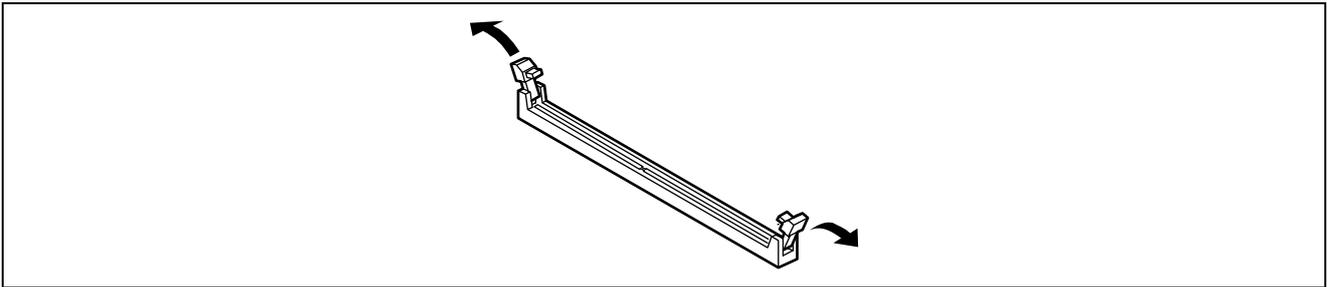
6. Disengage the lower two hooks from the DIMM unit, and remove the memory board.



7. Locate the DIMM socket in which you are going to install the first DIMM of the pair.

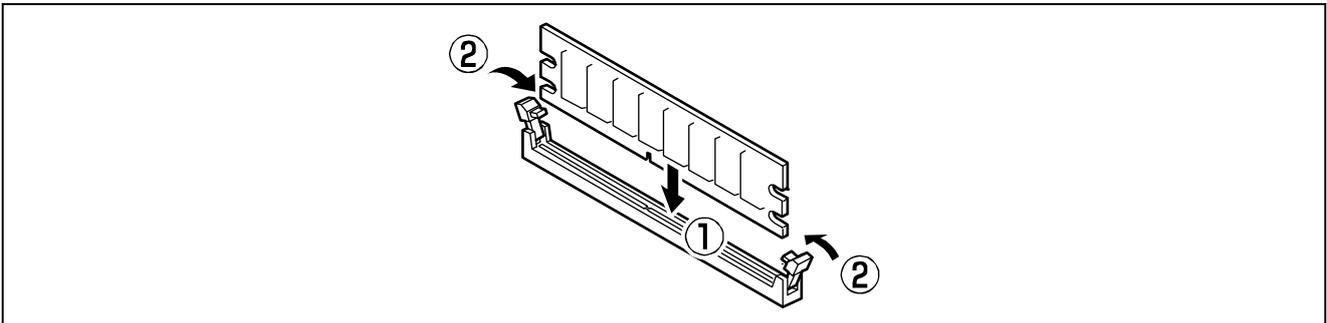


8. Fully open the levers at both ends of the socket (1) and remove the socket cover.



9. Push the DIMM straight into the socket.

**IMPORTANT:** To avoid damaging the lever, do not apply an excess force to the lever.



**NOTE:** Make sure of the orientation of DIMM. The terminal side of the DIMM has a cutout to prevent incorrect insertion.

The levers automatically close when the DIMM is fully inserted in the socket.

10. Close the levers securely.
11. Install the second DIMM of the pairs in the other DIMM connector similarly to Steps 7 through 10.
12. Replace the memory board removed in Step 3.
13. Replace the front bezel.
14. Power on the server and check that no error message is displayed during the POST.  
If the POST displays an error message, note the message and refer to the POST error messages listed in Chapter 8.
15. Start the SETUP and select [Advanced] → [Memory Configuration] to check that the DIMM modules have a "Normal" status. (See Chapter 4 for details.)
16. Select "Yes" for [Reset Configuration Data] on the [Advanced] menu.  
This setting is required to change the hardware configuration data. See Chapter 4 for details.
17. If the server is running under Windows Server 2003, set the paging file size to the recommended value (total memory size \* 1.5) or to a greater value. See Chapter 5 for details.

## Removal

Remove a DIMM as described in the following procedure.

---

**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 with your fingers or place the DIMM directly on the desk. For more information on static electricity, refer to the "Anti-static Measures" section.

---

**NOTE:** To remove a failed DIMM, check the error message appearing during POST or via NEC ESMPRO to identify the DIMM socket (group) in which the failed DIMM is installed.

---

1. See the section "Preparing for Installation and Removal" described earlier.
2. Unlock the front bezel using the security key, and remove the front bezel.
3. Remove the memory board according to "Memory Board" described earlier.
4. Open the levers at both ends of the socket from which you remove the DIMM.  
The DIMM is unlocked and ready for removal.
5. Remove the DIMM from the paired connector.
6. Replace the memory board removed in Step 3.
7. Replace the front bezel.
8. Power on the server and make sure that the POST displays no error messages.  
If the POST displays an error message, note the message and refer to the POST error messages listed in Chapter 8.
9. Start the SETUP and select [Advanced] → [Memory Configuration] → [Memory Retest] → [Enabled] to clear the error information about the removed DIMM slot. (See Chapter 4 for details.)
10. Select "Yes" for [Reset Configuration Data] on the Advanced menu.  
This setting is required to change the hardware configuration data. See Chapter 4 for details.

## Memory Mirroring

The server supports the Memory Mirroring feature.

To use Memory Mirroring feature, select the supported function from the BIOS Setup Utility in the configuration enabling the relevant environment build-up.

### Memory Mirroring Feature

The memory mirroring feature places a memory board as spare memory in standby state. If a memory board in use encounters an uncorrectable error, the memory mirroring feature switches to the memory board in standby. In order to use this feature, the memory board in use and the standby memory board should be combined.

Available combinations are:

- Mirroring with a pair of memory boards A and B and a pair of memory boards C and D

To enable the memory mirroring feature, the combined memory boards must have DIMMs of the same size and capacities.

### BIOS Setting

Start SETUP and select [Advanced] → [Memory Configuration] → [Memory RAS Feature] and set as follows:

- To enable the memory mirroring feature: Select [Mirror].

## Others

- Memory capacity displayed on the OS = total capacity of physically installed memory – capacity for standby memory  
Memory mirroring feature: 1/2 of the actually installed memory capacity  
Enabling the memory mirroring feature does not influence the applications operation.
- The Memory Mirroring feature is automatically disabled when the following error message is displayed:

8201    Mirroring Memory was not ready.
---

Check the DIMM installation status.

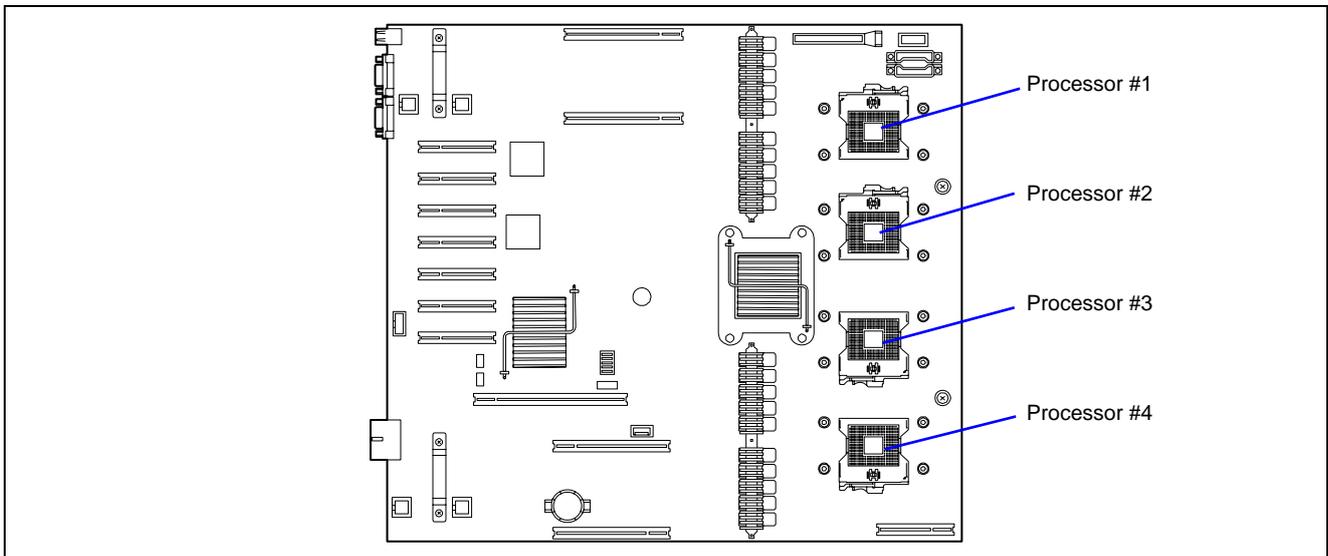
The following indicates that the memory mirroring feature has worked:

- a) The failing DIMM group is degraded when the server restarts.
- b) If the NEC ESMPRO Agent is installed, the following log is registered as a system log of Event Viewer:
  - Source name:    ESMCommonService
  - Event ID:        2313
  - Explanation:    Part of the DIMM was isolated due to a memory error.
  - Memory number: XX
  - Date/time:        XX
- c) If report setting is made through the NEC ESMPRO Agent, a Manager reporting and ALIVE reporting is performed. The report contents are as follows:
  - Explanation:    Part of the DIMM was isolated due to a memory error.
  - Memory number: XX
  - Date/time:        XX

---

## Processor

The processor board is equipped with sockets to install four processors. (One processor is factory-installed.)



---

### NOTES:

- If a different revision of the processor is installed in a multiprocessor system, Windows logs the following information at every startup. If this message is logged, it is not a problem for system operation.



## Installation

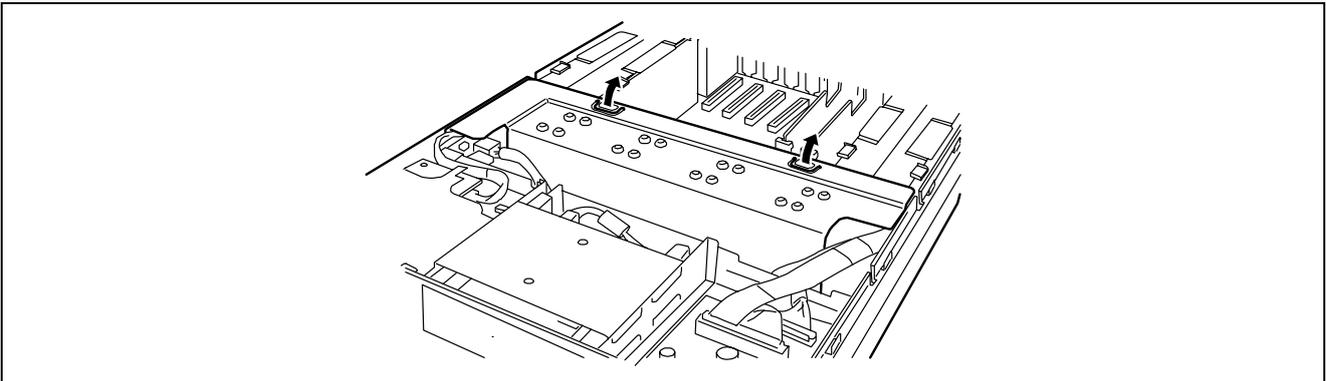
Follow the steps below to install the processor.

---

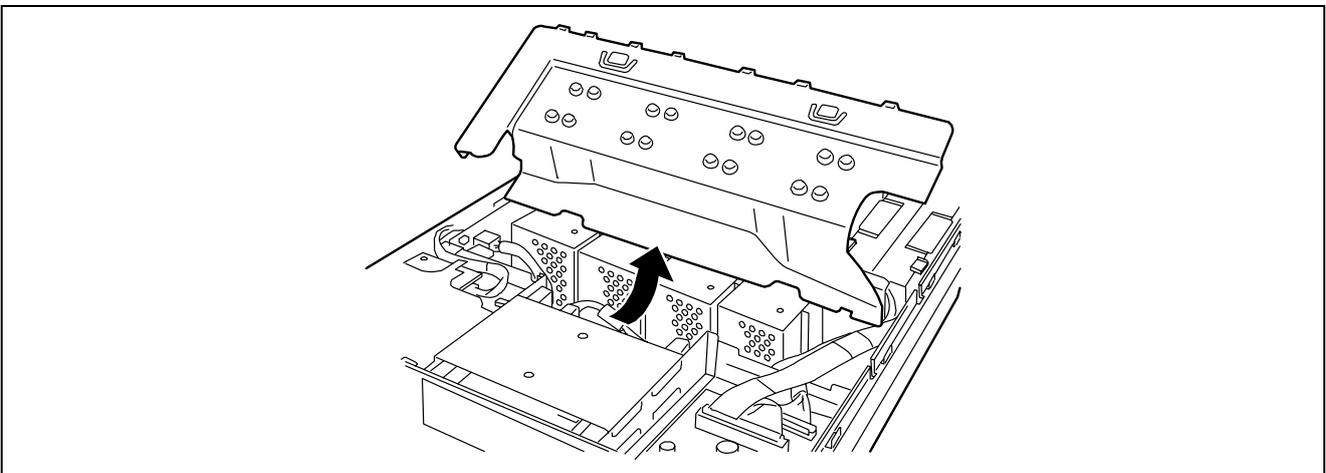
### IMPORTANT:

- The processor 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 processor. Do not touch the processor pins with your fingers or place the processor directly on the desk. For more information on static electricity, refer to the "Anti-static Measures" section.
  - When using the server with only one processor, it must be installed in the Processor #1 slot.
  - Install processors in the ascending order of the processor slot numbers (see figure on the previous page).
  - To maintain the cooling effect in the server, cover the empty slots of the processor with a dummy cover.
- 

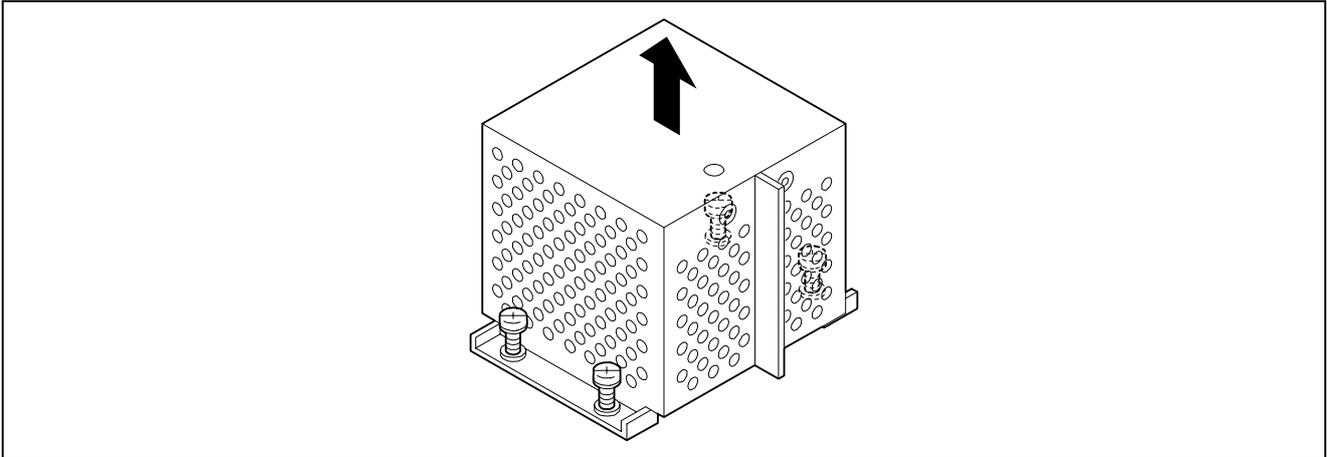
1. See the section "Preparing for Installation and Removal" described earlier.
2. Unlock the front bezel using the security key, and remove the front bezel.
3. Remove the cables from the front panel, and put them outside the server.
4. If an optional 5-inch device is installed, disconnect the cable from the device, and pull out the 5-inch device toward you.
5. Unlatch the hooks of the CPU protection cover.



6. Remove the CPU protection cover.

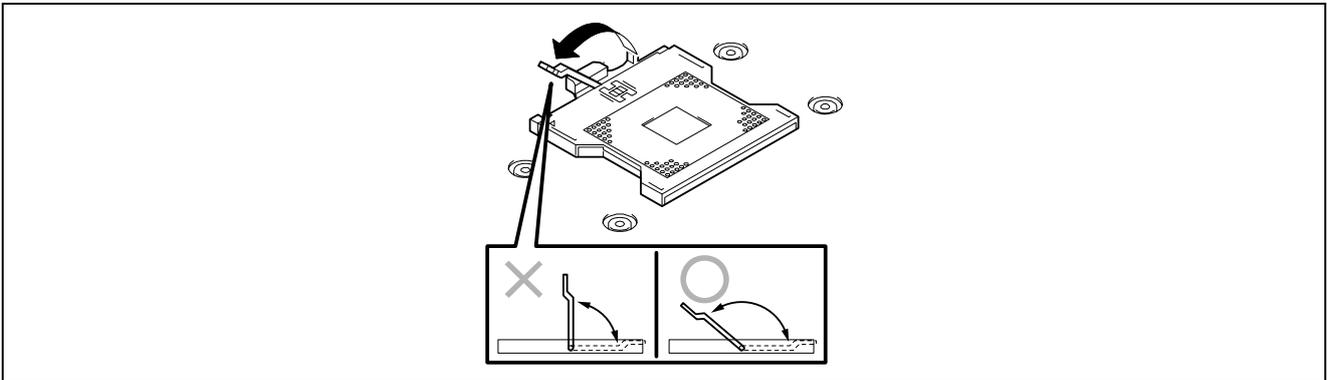


7. Remove the dummy cover from the socket.



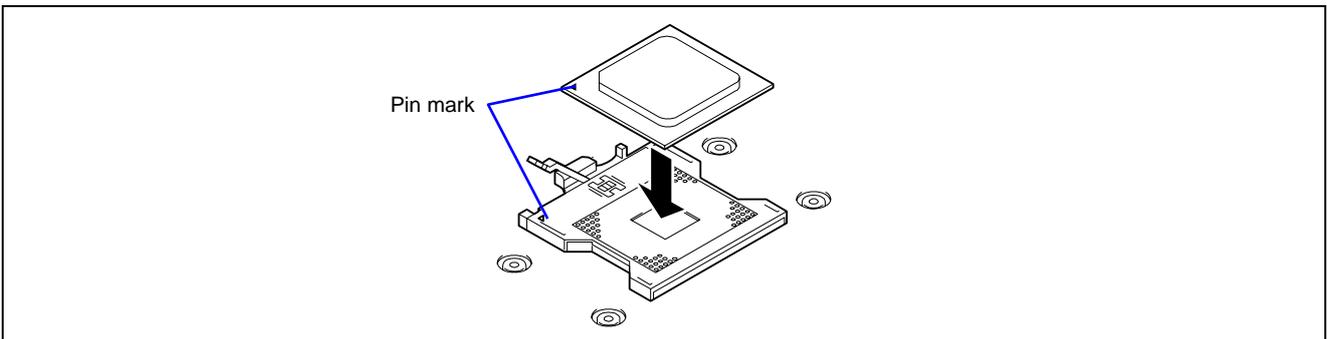
8. Raise the locking lever on the socket.

**IMPORTANT:** Open the lever until it stops. It can be opened to approx. 120 degrees.

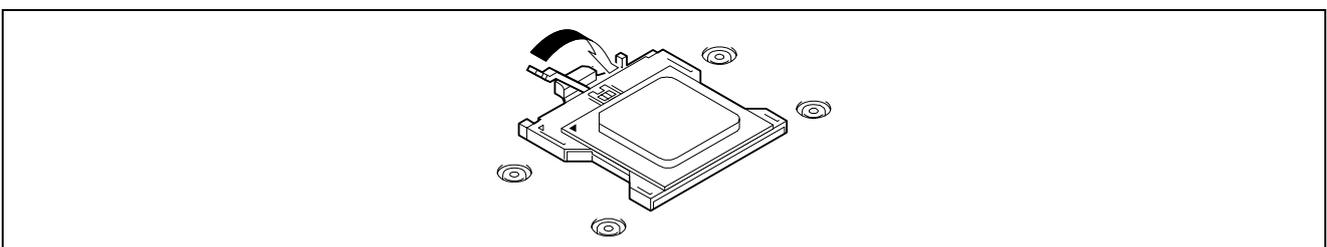


9. Put the processor on the socket slowly and gently.

**NOTE:** Make sure of the processor direction. The pin layout on two of the four corners differs from the others to prevent an incorrect insertion. Confirm the pin mark and pin layout on the socket, and insert the processor correctly.



10. Pressing lightly on the processor, push down the lever to secure the processor.

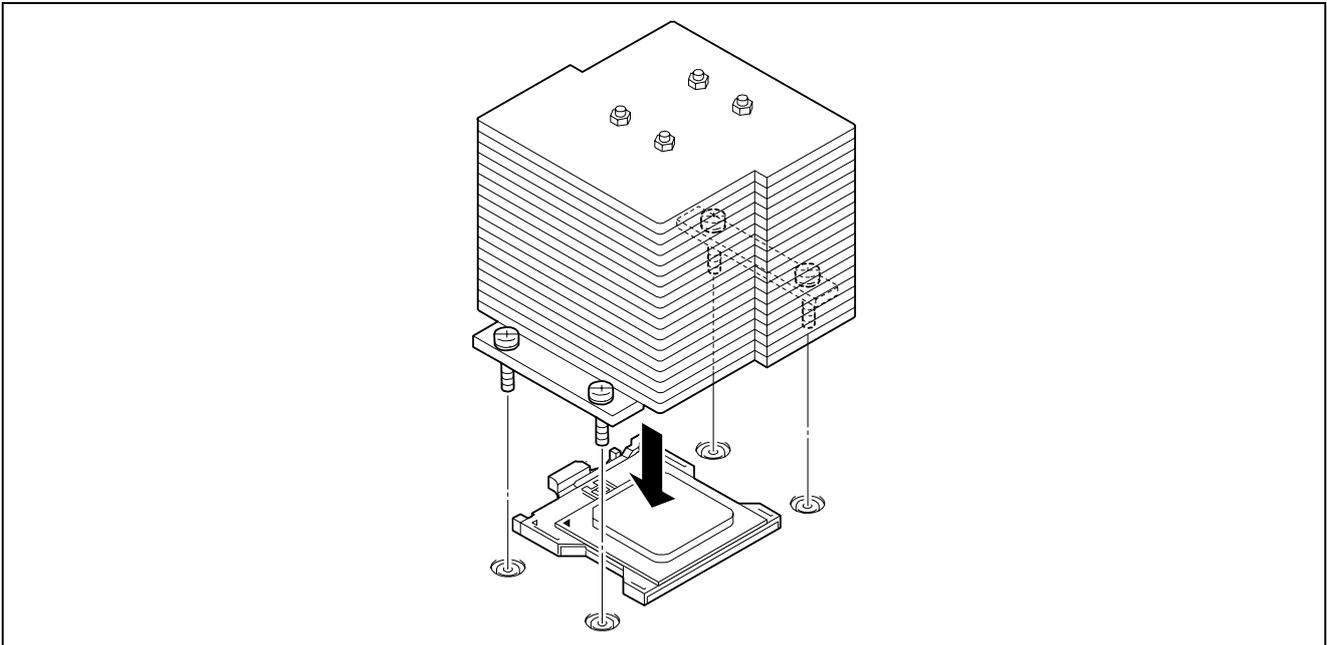


- Put the heat sink on the processor.

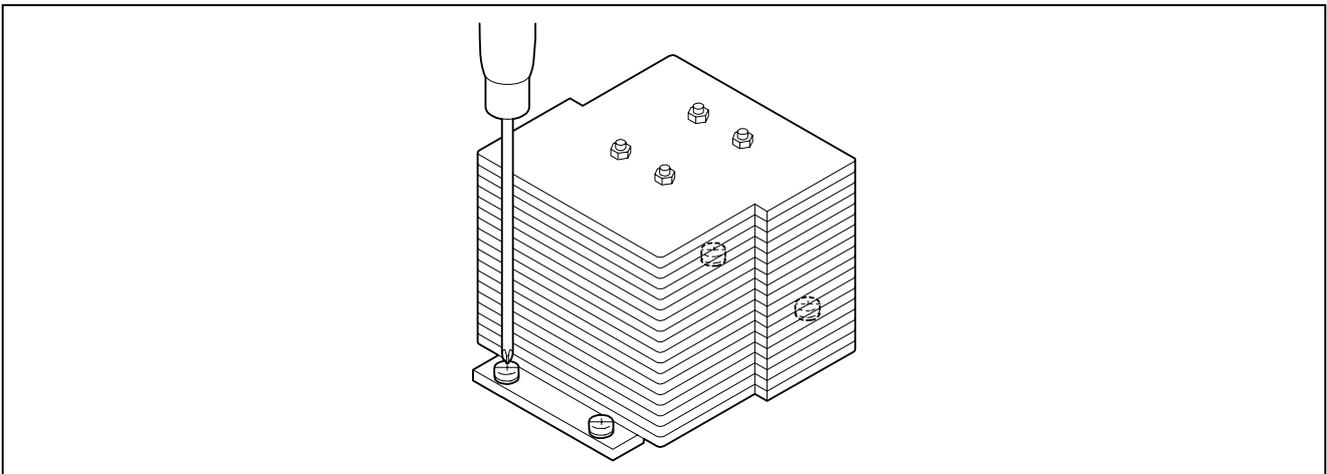
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**NOTE:** The heat sink can be installed both ways.

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- Tighten the four screws to secure the heat sink.



- Make sure that the heat sink is level.

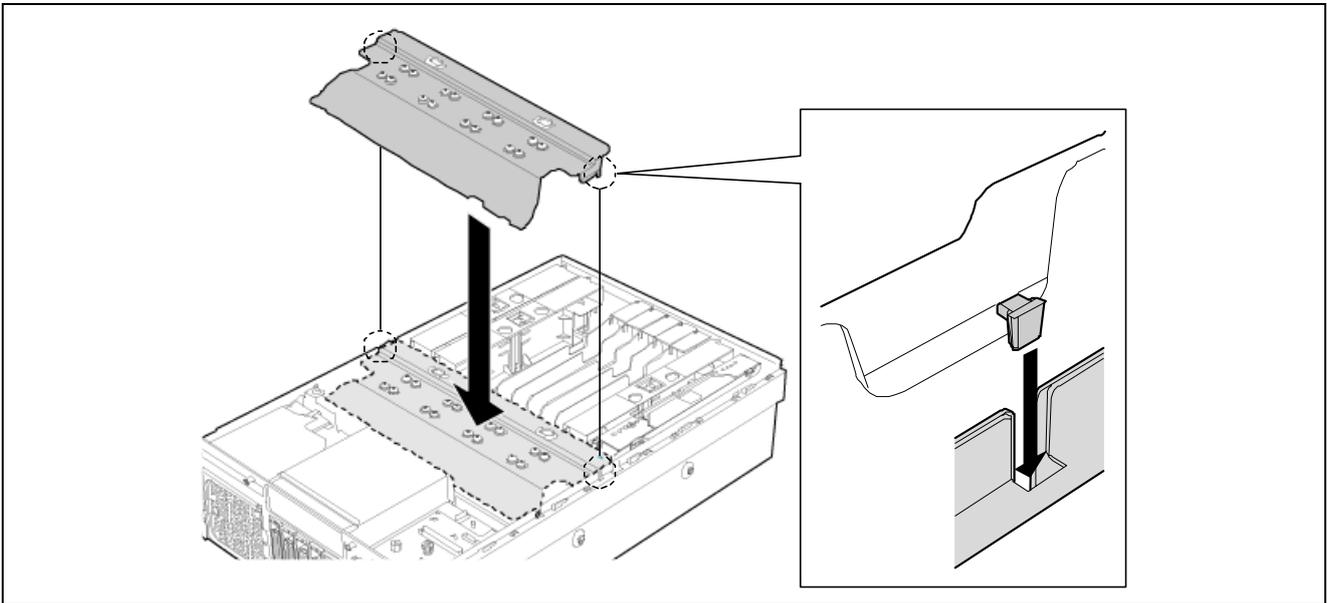
---

**IMPORTANT:** If the heat sink is not level, remove it, and make sure that the processor is positioned correctly.

---

**14.** Install the CPU protection cover.

Pass the cable through the cutout on the front of the protective cover. Then, engage the guides on the left and right sides of the cover with the cutout of the server chassis.



**15.** Start the SETUP and select "Yes" for [Reset Configuration Data] on the Advanced menu.

This setting is required to change the hardware configuration data. See Chapter 4 for details.

**16.** To add one or more processors to the server in 1-processor configuration to operate the server with more than one processor, do the procedure below:

For Windows Server 2003, change the driver of [Computer] in the device manager to [ACPI multi-processor PC] and then update the system (see Chapter 5).

## Removal

To remove the processor, prepare the removal referring to steps 1 and 6 of the installation procedure and do the reverse procedure of steps 7 to 14.

---

**IMPORTANT:**

- Do not remove any processor unless it is failed.
  - To maintain the cooling effect in the server, a dummy cover is installed in the empty slot. Make sure to install a dummy cover on the slots where no processor is installed.
  - After operation, the heat may make the cool seat at the bottom of the heat sink adhere to the processor. To remove the heat sink from the processor, first turn the heat sink to the left and then slightly to the right to make sure that the heat sink can be separated from the processor. Removing the heat sink and processor at the same time may cause the processor and/or socket to be defective.
- 

Follow the procedure below if a processor is removed (or replaced).

1. Start SETUP to select "Main" – "Processor Settings" – "Processor Retest" in order to clear the error information on the removed processor (see Chapter 4).

When replacing a processor, select "Main" – "Processor Settings" to confirm that the ID and L2 and L3 Cache of the additional processor are defined normally (see Chapter 4).

2. Select "Yes" for [Reset Configuration Data] on the Advanced menu.

This is required to update the hardware configuration information. See Chapter 4 for details.

# Appendix A

## Specifications

Item		NovaScale R480 E1	
Model type at shipment		Diskless	
Processor	Type	Quad-Core Intel® Xeon® Processor 7300 series or Dual-Core Intel® Xeon® Processor 7200 series	
	Model	E7210	X7350
	Clock	2.40GHz	2.93GHz
	2nd cache	2x4MB	
	Number of processors	1	
Maximum	4		
Chipset		Intel® 7300 + Intel® 6321 + ServerEngines™ 2nd Gen Server Management Controller	
Memory	Standard	2GB (1GB x 2), one memory board	
	Maximum	128GB (The standard DIMM must be replaced.)	
	Expansion unit	2 DIMMs (1024/2048/4096MB)	
	Expansion times	Maximum 16 times (4 times per each memory board)	
	Memory module	DDR2 667 FBDIMM	
	Error check	ECC	
Memory mirroring feature	Supported		
Graphics (VRAM)		ServerEngines™ 2nd Gen Server Management Controller embedded (8MB)	
Auxiliary input device	Floppy disk	Option (external USB drive)	
	Hard disk drive (standard)	-	
	Hard disk drive (maximum)	1172 GB (146.5 GB x 8)	
	CD-RW/DVD-ROM (standard)	DVD: x3 to x8 speed max. CD: x10 to x24 speed max.	
5.25-inch device bay		1 slot (half height)	
2.5-inch disk bay		Up to 8 slots	
Additional slot	PCI Express (x8)	4 slots (2 slots are hot-swappable)	
	PCI Express (x4)	3 slots (x8 board can be installed)	
LAN interface		1000BASE-T/100BASE-TX/10BASE-T (4 ports)	
LAN interface (A-RMC)		100BASE-TX/10BASE-T (1 port, dedicated for server management)	

Internal interface	Keyboard
	Mouse
	USB
	Serial
	Network
	Display
Cabinet design	19-inch rack mounting type (4U)
External dimensions	483 (width) × 178 (height) × 706 (depth) mm
Weight	47 kg (Max.)
Power supply	100 Vac ±10%, 200 Vac ±10%, 50/60 Hz (100 Vac: parallel bi-polar power outlet with the ground line, 200 Vac: separately priced AC cable required)
Power consumption	1800 VA / 1405 W
Environmental requirements	Temperature
	Humidity
Others	EXPRESSBUILDER supported, NEC ESMPRO provided in the standard configuration

# Appendix B

---

## Other Precautions

---

### Transfer Rate of the On-board LAN Controller

The LAN controller on the base board has two ports, and another two ports on the I/O riser board. Each port supports 10Base-T, 100Base-TX, and 1000Base-T networks and is capable of full or half duplex.

The controller can automatically detect and switch for network speed and transfer mode connected to the HUB. However, for proper network operation, specify a "Link Speed & Duplex" value identical to the value specified for the HUB.

---

### Server Management Software

The EXPRESSBUILDER DVD that comes with the server contains the NEC ESMPRO utility.

We recommend you install NEC ESMPRO for effective use of the reliability enhancement features of the server.

---

### Floppy Disk

Your server is not equipped with a floppy disk drive. Use the optional USB floppy disk drive if necessary.

---

### Using a Client Machine Which Has a CD Drive

The EXPRESSBUILDER disk is contained on a DVD, meaning that the client machine you wish to use to manage the server needs a DVD drive.

If you want to install the EXPRESSBUILDER management software to the client without a DVD drive, make a CD-R from the EXPRESSBUILDER DVD as described in the following procedure.

---

**NOTE:** This procedure can only create one CD, for the purpose of installing the management software to the client.

---

1. Insert the EXPRESSBUILDER DVD in a DVD drive.
2. If the Autorun menu appears, close the menu.
3. Copy the following EXPRESSBUILDER files to a hard disk drive by using the Explorer.

```
\(root folder)
|
| \001 : copy version.xml
|
| --- \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 drive, and rename the ar\_menu\autorun\_en.xml on the hard disk drive 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 in Step 3.
7. Insert the CD-R in the client machine on which you want to install the management software.
8. Kick the following file of the CD-R by using Explorer.

ar\_menu\autorun\_menu.exe (for Windows 32 bit edition)

autorun\_menu\_x64.exe (for Windows 64 bit edition)

---

## CD/DVD-ROM

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

- Press the center of the storage case to remove the CD/DVD-ROM from its case.
- Do not drop the CD/DVD-ROM.
- Do not place anything on the CD/DVD-ROM or bend the CD/DVD-ROM.
- Do not attach any label onto the CD/DVD-ROM.
- Do not touch the signal side (nothing is printed on this side) with your fingers.
- Place the CD/DVD-ROM with its printed side upward and gently put it on the tray.
- Do not scratch the CD/DVD-ROM or write anything directly on it with a pencil or ball-point pen.
- Do not leave the CD/DVD-ROM near foods and drinks, or in a place exposed to cigarette smoke.
- Do not leave the CD/DVD-ROM in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).
- When dust or fingerprints are visible on the CD/DVD-ROM, wipe the CD/DVD-ROM from its center to the edge using a dry soft cloth slowly and gently.
- Use the CD/DVD cleaner to clean the CD/DVD-ROM. Do not use record spray/cleaner, benzene, or thinner.
- Keep the CD/DVD-ROM in a CD/DVD-ROM case when not using it.
- Do not hit the CD/DVD-ROM with the screw fixing the top cover when setting or removing disc.

---

## Tape Media

The following describes the handling of data 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 make two copies: a primary and a secondary tape.

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

We recommend 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.

---

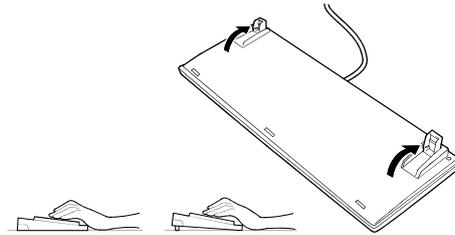
## Keyboard

The keyboard is a device used 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 at an angle at which the keyboard is easy to operate. This adjustment helps 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 a mouse to operate properly.

---

### NOTE:

- Functions assigned to the mouse buttons vary depending on the software. For details, refer to the manual provided with the software.
- Use the mouse on a clean desk. Using the mouse on a dusty or dirty desk disturbs smooth movement or normal operation of the mouse. When your mouse movement seems dull, clean your mouse. (See Chapter 7.)

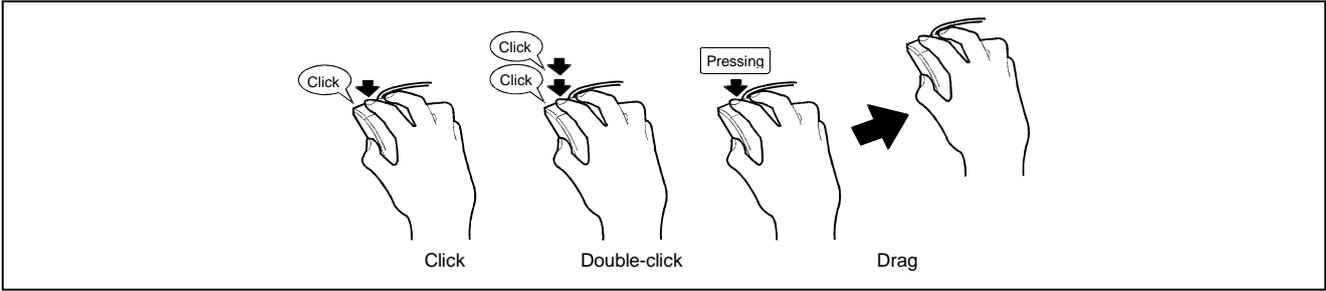


---

Mouse operation includes "Click," "Double-click," and "Drag."

- |               |  |
|---------------|--|
| Click:        | Press the button only once and release it.           |
| Double-click: | Press the button twice consecutively and release it. |
| Drag:         | Press and hold the button and move the mouse.        |

Operation of the server involves combinations of these mouse operations and data entries with the keyboard.



# Appendix C

---

## IRQ and I/O Port Address

The factory-set interrupt requests and I/O port addresses are listed below. Find an appropriate one to install an optional device.

### Interrupt Request

The factory-set IRQs are assigned as follows:

IRQ	Peripheral Device (Controller)	IRQ	Peripheral Device (Controller)
0	System timer	8	Real-time clock
1	(Keyboard)	9	PCI/SCI
2	Cascaded connection	10	Reserved
3	COM B serial port (PCI)	11	BMCIHQ
4	COM A serial port (PCI)	12	(Mouse)
5	Reserved	13	Reserved
6	Reserved	14	Primary IDE (CD-RW/DVD-ROM drive)
7	Reserved	15	Reserved

## I/O Port Address

The factory-set I/O port addresses for the server are assigned as follows:

Addresses	Description	Chip
00-08h	DMA Control Registers	ESB-2E
09-0Eh	RESERVED	ESB-2E
0Fh	DMA Control Register	ESB-2E
10-18h	DMA Control Register	ESB-2E
19-1Eh	RESERVED	ESB-2E
1Fh	DMA Control Register	ESB-2E
20-21h	Master 8259 Programming Interface	ESB-2E
24-25h	Master 8259 Programming Interface	ESB-2E
28-29h	Master 8259 Programming Interface	ESB-2E
2C-2Dh	Master 8259 Programming Interface	ESB-2E
2E-2Fh	Configuration Registers	SIO3
30-31h	Master 8259 Programming Interface	ESB-2E
34-35h	Master 8259 Programming Interface	ESB-2E
38-39h	Master 8259 Programming Interface	ESB-2E
3C-3Dh	Master 8259 Programming Interface	ESB-2E
40-42h	8254 Programming Interface	ESB-2E
43h	RESERVED	ESB-2E
4E-4Fh	Configuration Registers	Pilot-II
50-52h	8254 Programming Interface	ESB-2E
53h	RESERVED	ESB-2E
60h	Keyboard/Mouse	Pilot-II
61h	NMI Status Register	ESB-2E
62h		Pilot-II
63h	NMI Status Register	ESB-2E
64h	Keyboard/Mouse	Pilot-II
65h	NMI Status Register	ESB-2E
66h		Pilot-II
67h	NMI Status Register	ESB-2E
70h	RESERVED	ESB-2E
71h	RTC (data)	ESB-2E
72h	RTC (data)	ESB-2E
73h	RTC (data)	ESB-2E
74h	RTC (data)	ESB-2E
75h	RTC (data)	ESB-2E
76h	RTC (data)	ESB-2E
77h	RTC (data)	ESB-2E
80-91h	16-bit DMA Control Registers	ESB-2E
92h	Port 92 Register	ESB-2E
93-9Fh	DMA Control Register	ESB-2E
A0-A1h	Slave 8259 Programming Interface	ESB-2E
A4-A5h	Slave 8259 Programming Interface	ESB-2E
A8-A9h	Slave 8259 Programming Interface	ESB-2E
AC-ADh	Slave 8259 Programming Interface	ESB-2E
B0-B1h	Slave 8259 Programming Interface	ESB-2E
B2-B3h	Power Management	ESB-2E
B4-B5h	Slave 8259 Programming Interface	ESB-2E
B8-B9h	Slave 8259 Programming Interface	ESB-2E
BC-BDh	Slave 8259 Programming Interface	ESB-2E
C0-D1h	DMA Controller Page Registers	ESB-2E
C2-DDh	RESERVED	ESB-2E
DE-DFh	DMA Controller Page Registers	ESB-2E
F0h	Reset IRQ13	ESB-2E
170h-177h	Secondary IDE Command Block Registers	ESB-2E
1F0h-1F7h	Primary IDE Command Block Registers	ESB-2E

<b>Addresses</b>	<b>Description</b>	<b>Chip</b>
376h	Secondary IDE Control Block Registers	ESB-2E
3F6h	Primary IDE Control Block registers	ESB-2E
4D0h	Master 8259 ELCR Programming	ESB-2E
4D1h	Slave 8259 ELCR Programming	ESB-2E
500-53Fh	ACPI Register	ESB-2E
540-55Fh	TCO register	ESB-2E
560-57Fh	SMBus IO Register	ESB-2E, During Only Early POST Phase.
580-5BFh	GPIO Register	ESB-2E
800-80Fh	IO Trap Register	ESB-2E, IOTRAP
CA2-CA3h	BMC SMS KCS Interface	Pilot-II
CA4-CA5h	BMC SMM KCS Interface	Pilot-II
CF9h	Turbo and Reset Control	ESB-2E
1000-EFFFh	I/O Space for PCI/PCI-X/PCIE Device	Allocated by System BIOS PnP.
FE10-FE13h	ACPI Phoenix BIOS Services	IOTRAP

\*1 Hexadecimal notation

\*2 The I/O port address of a PCI device is set according to its type and number.



# Appendix D

---

## Installing Windows Server 2003 x64 Editions

This section describes the procedure for the installation of Windows Server 2003 x64 Editions without using the Express Setup tool.

### BEFORE INSTALLING Windows Server 2003 X64 EDITIONS

Please read carefully the following information BEFORE installing Windows Server 2003 x64 Edition.

---

#### Optional Boards Supported by EXPRESSBUILDER

EXPRESSBUILDER DVD attached to your system supports the following optional boards:

---

**NOTE:** If you want to install boards other than the ones listed below, using a driver floppy disk ("OEM-FD for Mass storage device"), refer to "Exceptional Setup" and "Installing Optional Mass Storage Driver" of "Parameter File Creator" in Chapter 6.

---

- Supporting the OS installation in EXPRESSBUILDER
  - LSI MegaRAID™ SAS PCI EXPRESS™ ROMB (embedded on the motherboard)
- Other optional boards
  - LSISAS3443E-R SAS Controller
  - LSILogic MegaRAID SAS 8480E Disk Array Controller (External SAS HDD)

---

#### Updating the System

If you modified the Windows system, execute "Update the System" in the Windows Autorun Menu.

---

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

If you want to keep 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 in which the OS had been installed as the partition on which to re-install the OS.
- Select "Use the current File System" as the format of the OS partition.

---

#### MO Device

If you specify the file system as NTFS with a MO Device connected during the installation, the file system will not be converted normally. Disconnect the MO Device and restart the installation from the beginning.

---

#### Media such as DAT

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

---

## About the System Partition Size

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

$$\begin{aligned} & \text{Size necessary to install the system} + \text{Paging File Size} + \text{Dump File Size} \\ & \quad + \text{Application Size} \\ \text{Size necessary to install the system} &= 4100\text{MB (Windows Server 2003 x64 Editions)} \\ &= 4100\text{MB (Windows Server 2003 x64 Editions with Service Pack2)} \\ &= 5900\text{MB (Windows Server 2003 x64 Editions + Service Pack 2} \\ & \quad \text{CD-ROM)} \\ \text{Paging File Size (Recommended)} &= \text{Mounted Memory Size} \times 1.5 \\ \text{Dump file Size} &= \text{Mounted Memory Size} + 1\text{MB} \\ \text{Application Size} &= \text{Required Size} \end{aligned}$$

---

### IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). A paging file with an 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 a virtual memory shortage if the paging file is insufficient, so set a paging file size large enough for 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 need to install any additional software applications, add necessary space to the partition to install these programs.
- 

For example, if the mounted memory size is 512MB, the partition size will be calculated by the above formula as follows:

$$\begin{aligned} & 4100\text{MB} + (512\text{MB} * 1.5) + (512\text{MB} + 1\text{MB}) + \text{Application Size} \\ &= 5381\text{MB} + \text{Application Size} \end{aligned}$$

If the required partition size is larger than the size of a hard disk drive, we recommend you split the file across several disks.

1. Set the "Size required for installation + Paging file size".
2. Set the debugging information (equivalent to the dump file size) so that it is written to a separate disk. (If necessary, install an additional new disk.)

# INSTALLING Windows Server 2003 X64 EDITIONS

## Preparations for Installation

- EXPRESSBUILDER DVD
- Microsoft Windows Server 2003 Standard x64 Edition (CD-ROM) / Microsoft Windows Server 2003 Enterprise x64 Edition (CD-ROM)
- Microsoft 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 the server on 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 using one of the two procedures below:

- Create from the menu which appears when running the server with the EXPRESSBUILDER.

If you have only the 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 the server, you can use the other procedure described later.

Follow the steps below.

1. Prepare one 3.5-inch floppy disk.
2. Turn on your server.
3. Insert the EXPRESSBUILDER DVD into the CD-RW/DVD-ROM drive of the server.
4. Press the RESET switch or press **Ctrl, Alt** and **Delete** to reboot the server. (You may also turn off and then on again to reboot the server.)

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

5. Select [Create the OEM-Disk for Windows] from [Tools Menu] step.
6. Select [Create an Windows Server 2003 x64 Editions OEM-Disk for EXPRESSBUILDER] at [Create OEM-Disk] and click [Perform].
7. Insert a floppy disk into the floppy disk drive according to the on-screen instructions.

Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER will be created.

Write-protect and attach a label, then keep it safely.

■ Create from [Autorun Menu]

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

You can create the Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER from [Autorun Menu], if you have a computer on which one of the above operating systems operate.

Follow the steps below.

1. Prepare one 3.5-inch floppy disk.
2. Start the Operating System.
3. Insert the EXPRESSBUILDER DVD into the CD-RW/DVD-ROM drive of the server.  
The Menu appears.
4. Click [Create drive disk] and select [OEM-Disk for Windows Server 2003 x64 Edition].

---

**NOTE:** You can do the same operation using the menu that appears with a right-click.

---

5. Insert the floppy disk into the floppy disk drive according to the message.  
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.

1. Power on the system.
2. Insert the Windows Server 2003 x64 Edition CD-ROM into the CD-RW/DVD-ROM drive.
3. Press **Ctrl + Alt + Delete** to restart the system.

If a bootable operating system is 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.

Restart the server and perform this step again.

4. Press **F6** during the few seconds in which the window is in one of the following states.
  - "Setup is inspecting your computer's hardware configuration ..." is displayed.
  - A screen with a solid blue background is displayed.

---

**IMPORTANT:** There is no visible indication on the screen when **F6** has been pressed.

---

5. When the following message is displayed, press **S**.

Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter. Currently, Setup will load support for the following mass storage device(s).

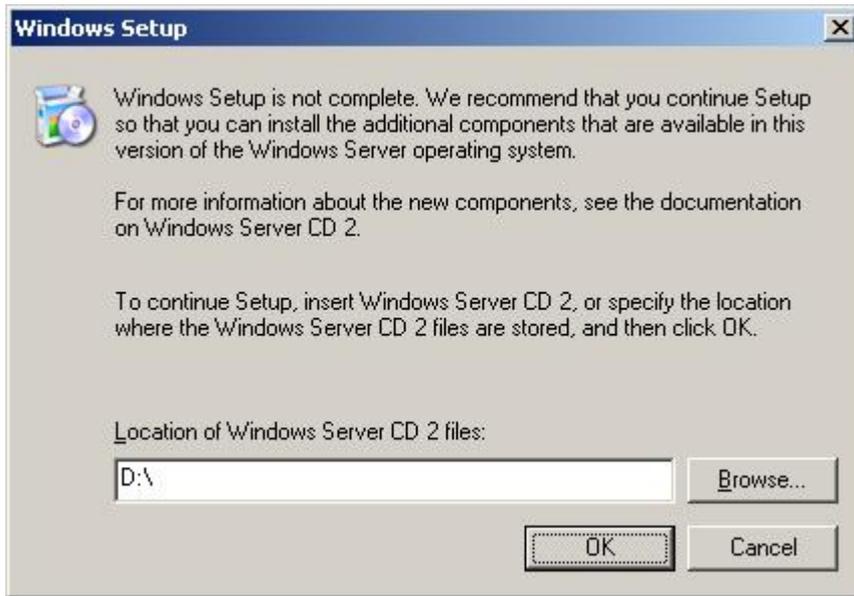
The following message is displayed.

Please insert the disk labeled  
manufacturer-supplied hardware support disk  
into Drive A:  
\*Press ENTER when ready.

6. Insert the Windows Server 2003 x64 Edition OEM-Disk for EXPRESSBUILDER into the floppy disk drive, and press **Enter**.

A list of mass storage devices is displayed.
7. Select the proper SCSI Adapter and press **Enter**.
  - LSI MegaRAID SAS RAID Controller Driver (Server 2003 for x64)Continue performing tasks according to the subsequent messages that appear.
8. When the following message is shown, press Enter to start "Welcome to Setup".

9. When the installation of Windows Server 2003 x64 Edition is finished, the system reboots automatically.
10. The [Windows Setup] screen is displayed after logging 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.
- 

11. Insert the Microsoft Windows Server 2003 R2 x64 Edition DISC 2 CD-ROM into the CD-RW/DVD-ROM drive. Confirm the parameters and click [OK].
12. Once the installation is completed, remove the Microsoft Windows Server 2003 R2 x64 Edition DISC 2 CD-ROM from the CD-RW/DVD-ROM drive, and restart the system.  
Make sure to execute the tasks described in "Driver Installation and Advanced Settings" and "Updating the System" of this manual.

### Procedure for License Authentication

The Product Key used in the procedure for license authentication should match the COA label in which the product key contained in Windows Server 2003 is written.

---

**NOTES:**

- Execute the activation within 30 days. The system may be locked once 30 days have passed.
  - The COA label may be attached to your server.
-

---

## Updating the System - Applying Service Pack -

Update the system in the below situations:

- Expanded the CPU (expanded to single processor to multi-processor).
- Modified the 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. We recommend this system update.

It is necessary to use ServicePack2 or more.

If you install the 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 on to the "Updating the System" section.

Perform "Updating the System" and apply the "Hotfix (KB921411)".

---

**IMPORTANT:** In the situations below, make sure to apply "Updating the System" and "Hotfix (KB921411)".

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

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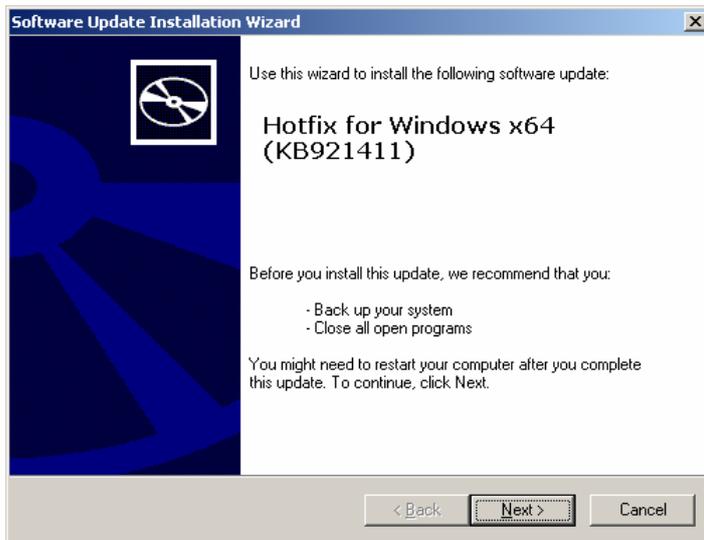
**NOTE:** If you use Windows Server 2003 x64 Editions CD-ROM which includes Service Pack 2, the application of "Hotfix (KB921411)" is not required.

---

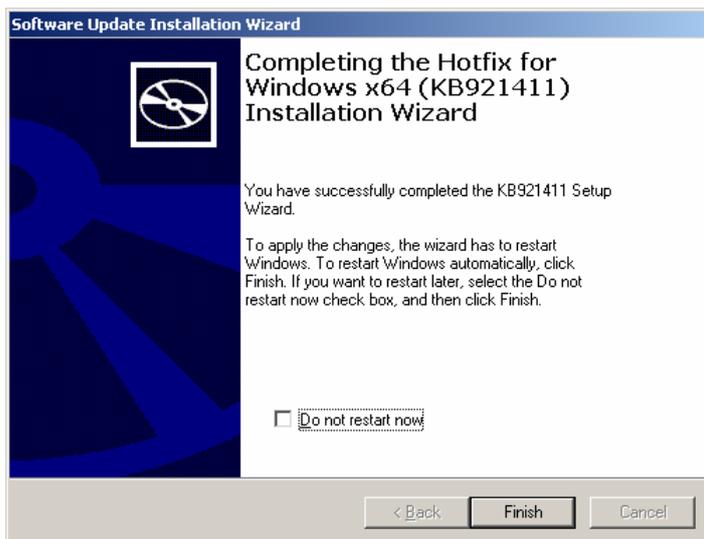
## Application Process of the Hotfix (KB921411)

Apply the "Hotfix (KB921411)" before executing the system update.

1. Log on to the system with an account with administrator authority to the CPU blade (such as administrator).
2. Insert the EXPRESSBUILDER DVD into the CD-RW/DVD-ROM drive of the server.
3. Click Start menu and [Run], and then execute the following command.  
<When Windows Server 2003 x64 Editions is used>  
\\001\win\winnt\w2k3amd\qfe\jpn\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, click [Finish] to restart the system.



With that, application process of the Hotfix (KB921411) is finished.

## Applying the "Updating the System" Process

"Updating the System" applies the drivers necessary for the NovaScale R480 E1 Series.

Follow this process after Hotfix for Windows x64 (KB921411) or Hotfix for Windows Server 2003 (KB921411) has been applied.

---

**NOTE:** If you install the Windows CD-ROM that contains Service Pack 2 to your system, you do not have to apply the Service pack 2 again.

---

1. Log on to the system using an account with administrator privileges (e.g.administrator).
2. Insert the EXPRESSBUILDER DVD into the CD-RW/DVD-ROM drive of server.  
The Windows Autorun Menu will be displayed
3. Left-click on [Setup], and then click [Update the system].

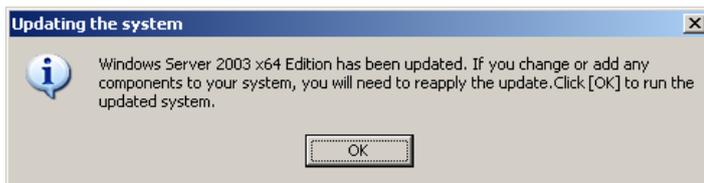
---

**NOTE:** You can also right-click the Autorun Menu.

---

Follow the on-screen messages to proceed to the application.

The [OK] dialog box is displayed.



---

**IMPORTANT:** During the "Updating the System" process, the following message may be shown, but there is no impact to the operation.

Do not click [cancel] since it disappears after a few seconds.



- 
4. Click [OK] to restart the system.
  5. Remove the EXPRESSBUILDER DVD from the CD-RW/DVD-ROM drive immediately when the system restarts.

## 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 the 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 the [Tools] and [Folder Options].
2. Select the [Files and Folders] - [Hidden files and folders] - [Show hidden files and folders] radio button from the Advanced settings in the [View] tab.
3. Check off the following check box in the [Files and Folders] from the Advanced settings in the [View] tab, and then click [OK].

Hide extensions for known file types

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 that the files exist.

Open the "<System drive:>\WINDOWS\system32\drivers" directory, and make sure that usbhub.sys and usbport.sys exist 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, the process is finished.

## DRIVER INSTALLATION AND ADVANCED SETTINGS

This section describes how to install and setup various standard drivers mounted on the device.

For any information on installing and setting up the driver that is not described in this section, please refer to the document attached to the driver.

---

### PROSet

PROSet is a utility that confirms the function of the network contained in the network driver.

Utilizing PROSet enables the following items:

- Confirm the detailed information of the adapter.
- Diagnose the loop back test, packet transmission test and so on.
- Setup the teaming.

Configuring several network adapters as one team provides the server with a fault-tolerant environment and enhances throughput between the switches.

PROSet is necessary to use these features.

Follow the procedure below to install PROSet.

1. Insert the EXPRESSBUILDER DVD into the CD-RW/DVD-ROM drive.
2. The [Windows Explorer] dialog starts.
3. Run "DXSETUP.EXE" in the following directory.  
    \001\win\winnt\w2k3amd\dl3\proset\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. Choose "Typical" and click [Next].
7. Click [Install].
8. When the [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.

---

## Network Driver

Specify the details of the network driver.

The driver for the standard network board that is mounted will be installed automatically, but the link speed and duplex mode needs to be specified manually.

[When PROSet is not installed]

1. The [Local Area Connection Properties] dialog box appears.
  - \* Procedure using the standard start menu
    1. Click the Start menu, click [Control Panel], click [Network Connections], and click [Local Area Connection].
  - \* Procedure using the classic start menu
    1. Click the Start menu, click [Settings] and click [Network Connections].  
The [Network Connections] dialog box appears.
    2. Right-click [Local Area Connection] and click [Properties] from the pop-up menu.
2. Click [Configure].  
The property dialog box for the network adapter appears.
3. Click [Advanced] and specify a [Link Speed & Duplex] value identical to the value specified for the HUB.
4. Click [OK] on the properties dialog box for the network adapter.

[When PROSet is installed]

1. Open the [Device Manager]
2. Double-click [(Network Adapter Name)] in the list.
3. Click the [Link] and specify a [Link Speed & Duplex Settings] value identical to the value specified for the HUB.
4. Click [OK].

You can also add or delete any protocols and services if necessary.

You can perform the same operation for the local area network which is displayed in [Network and Dial-up Connection].

---

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

---

---

## Optional Network Board Driver (1000BASE-T 2ch/1000BASE-T 4ch/1000BASE-T/10GbE)

If you want to use an optional Network Board (1000BASE-T 2ch/1000BASE-T 4ch), install the driver stored in EXPRESSBUILDER DVD.

- When using the 1000BASE-T 2ch, 1000BASE-T 4ch, or 1000BASE-T:

"\001\win\winnt\w2k3amd\dl3\pro1000\winx64"

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

- When using the 10GbE:

Please refer to the installation manual provided with the board.

### Installation of the Optional Network Board Driver

1. Start Device Manager.
2. Click [Network adapters] and double-click [(Network Adapter Name)].  
[(Network Adapter Name) Properties] appears.

---

**NOTE:** [(Intel (R) PRO/1000...)] is the name of On-Board adapter. All other names show the Optional Network Board.

---

3. Click the [Driver] tab and click [Update Driver...].  
[Hardware Update Wizard] appears.
4. Select the [Install from a list or specific location (Advanced)] radio button and click [Next].
5. Select the [Search for the best driver in these locations] radio button and check off the [Search removable media (floppy, CD-ROM...)] check box.
6. Check the [Include this location in the search] check box and when using [1000BASE-T(2ch)/1000BASE-T (4ch)/1000BASE-T], specify  
[\001\win\winnt\w2k3amd\dl3\pro1000\winx64].  
Click [Next].
7. Click [Finish].

---

## Adapter Fault Tolerance (AFT)/Adaptive Load Balancing (ALB)

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 the AFT feature.

---

### IMPORTANT:

- AFT/ALB setup must be operated after installing the drivers 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 only to the Switching Hub.
  - When exchanging the motherboard or the option network card, make sure to remove the adapter team before the exchange and recreate the adapter team once the exchange is completed.
- 

If you want to use the AFT/ALB feature, follow the procedure below to setup.

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

\* Procedure using the standard start menu

Click the Start menu, point to [Control Panel], [Administrative tools], and click [Computer Management] and then double click the [(Network Adapter Name)] in the Network Adapter list.

\* Procedure using the classic start menu

1. Click the Start menu, point to [Settings] and click [Control Panel].
2. Click [Administrative Tools].
3. Click [Computer Management] and double click the [(Network Adapter Name)] in the Network Adapter list.

2. Select the [Teaming] tab and then check [Team with other adapters] and click [New Team...].

The [New Team Wizard] dialog box appears. Click [Next].

\*Specify a name for the team if necessary.

3. Select the adapters to include in the team.

---

## Graphics Accelerator Driver

The standard graphics accelerator driver is automatically installed by "Update NovaScale R480 E1 system".

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

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

1. Insert the EXPRESSBUILDER DVD into the CD-RW/DVD-ROM drive.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "Setup.exe" in the following directory.  
\\001\win\winnt\w2k3amd\video\setup.exe.
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 EXPRESSBUILDER DVD from the CD-RW/DVD-ROM drive, follow the on-screen instructions and restart the system.

---

## Installing the Disk Array Controller Driver (LSILOGIC MEGARAID SAS 8480E)

The Disk Array Controller driver will be installed automatically.

---

## Installing the SAS Controller Driver (LSISAS3443E-R)

If you use the SAS controller driver (LSISAS3443E-R), update your system using the EXPRESSBUILDER DVD attached to your system.

The SAS controller driver will be installed automatically.

## About Windows Activation

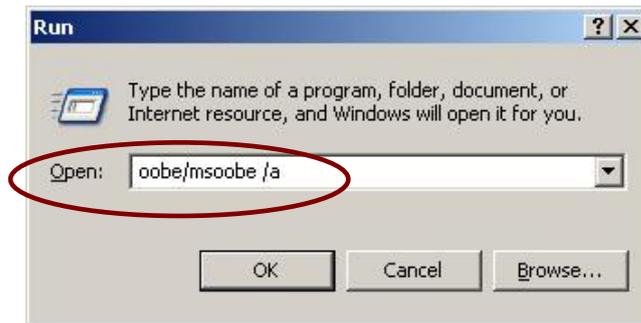
Windows Server 2003 x64 Editions must be activated before you can use Windows Server 2003 x64 Editions.

Windows activation process is as follows.

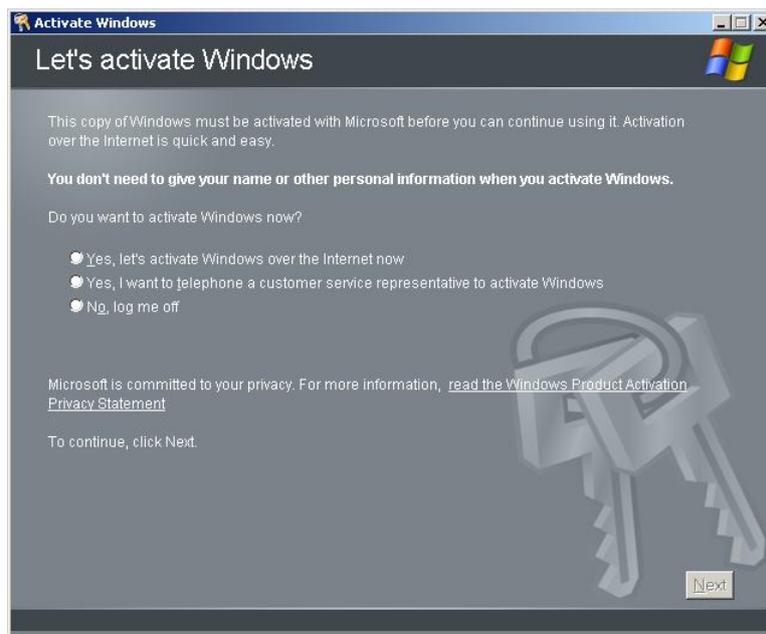
1. Click [Run] in the [Start] menu.

Type the following in the [Open:] box, and click [OK].

oobe/msoobe /a



2. When the screen below appears, click [Next].



The following screen is displayed.

Generating new Installation ID...

3. Process with the "Windows activation" according to the following message.



## **SETTINGS FOR THE MEMORY DUMP COLLECTION (DEBUG INFORMATION)**

Set the memory dump collection using the procedure described in Chapter 5.

# Appendix E

---

## Installing Windows Server 2003

This section describes the procedures for the installation of Windows Server 2003 without using the Express Setup tool.

### BEFORE INSTALLING Windows Server 2003

Please read carefully the following information BEFORE installing Windows Server 2003.

---

### Optional Boards Supported by EXPRESSBUILDER

EXPRESSBUILDER DVD attached to your system supports the following optional boards:

---

**NOTE:** If you want to install boards other than the ones listed below, using a driver floppy disk ("OEM-FD for Mass storage device"), refer to "Exceptional Setup" and "Installing Optional Mass Storage Driver" of "Parameter File Creator" in Chapter 6.

---

- Supporting the OS installation in EXPRESSBUILDER
  - LSI MegaRAID™ SAS PCI EXPRESS™ ROMB (embedded on the motherboard)
- Other optional boards
  - LSISAS3443E-R SAS Controller
  - LSILOGIC MEGARAID SAS 8480E Disk Array Controller (External SAS HDD)

---

### 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.

When using Windows Server 2003 with this equipment, surely apply ServicePack 1.  
When installing Windows Server 2003 R2, it is not necessary to apply Service Pack 1.

---

### Updating System

If you modified the Windows system, execute "Update the System" in the Windows Autorun Menu.

---

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

If you want to keep 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 in which the OS had been installed as the partition on which to re-install the OS.
- Select "Use the current File System" as the format of the OS partition.

---

## MO Device

If you specify the file system as NTFS with a MO Device connected during the installation, the file system will not be converted normally. Disconnect the MO Device and restart the installation from the beginning.

---

## Media such as DAT

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

---

## About the Upgrade to Windows Server 2003 R2

The "in-place upgrade" from Windows Server 2003 to Windows Server 2003 R2 is not recommended because it may overwrite any files or registries, and cause unexpected impact to the system or the applications.

If you install Windows Server 2003 R2, backup user data referring "Windows Server 2003 Clean Installation", and reinstall Windows Server 2003 R2.

---

**NOTE:** "in-place upgrade" is to perform overwrite upgrade from Windows Server 2003 which already installed to Windows Server 2003 R2.

---

---

## About the System Partition Size

The size for the partition on which 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 with Service Pack1)
	= 3500MB (Windows Server 2003 R2 with Service Pack2)
	= 5300MB (Windows Server 2003 R2 + ServicePack 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). A paging file with an 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 a virtual memory shortage if the paging file is insufficient, so set a paging file size large enough for 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 need to install any additional software applications, add necessary space to the partition to install these programs.
- 

For example, if the mounted memory size is 512MB, the partition size will be calculated by the above formula as follows:

$$3500\text{MB} + (512\text{MB} * 1.5) + (512\text{MB} + 12\text{MB}) + \text{Application Size} \\ = 4792\text{MB} + \text{Application Size}$$

If the required partition size is larger than the size of a hard disk drive, we recommend you split the file across several disks.

3. Set the "Size required for installation + Paging file size".
4. Set the debugging information (equivalent to the dump file size) so that it is written to a separate disk. (If necessary, install an additional new disk.)

# INSTALLING Windows Server 2003

## Preparations for Installation

- EXPRESSBUILDER DVD
- Microsoft Windows Server 2003 Standard Edition (CD-ROM) / Microsoft Windows Server 2003 Enterprise Edition (CD-ROM), Microsoft Windows Server 2003 R2 Standard Edition (CD-ROM) / Microsoft Windows Server 2003 R2 Enterprise Edition (CD-ROM)
- User's Guide
- Getting Started
- Windows Server 2003 OEM-Disk for EXPRESSBUILDER
- Windows Server 2003 Service Pack (CD-ROM)

---

## 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 the server on 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 the server with EXPRESSBUILDER.

If you have only the server to create Windows Server 2003 OEM-Disk for EXPRESSBUILDER, use this procedure.

If Windows Server 2003 or Windows can be operated on the server, you can use the other procedure described later.

Follow the steps below.

4. Prepare one 3.5-inch floppy disk.
5. Turn on your server.
6. Insert the EXPRESSBUILDER DVD into the CD-RW/DVD-ROM drive of the server.
7. 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 EXPRESSBUILDER starts.

8. Select [Create the OEM-DISK for Windows] from [Tools Menu] step.
9. Select [Create an Windows Server 2003 OEM-Disk for EXPRESSBUILDER] at [Create OEM-Disk] and click [Perform].

10. Insert a floppy disk into the floppy disk drive according to the on-screen instructions.

Windows Server 2003 OEM-Disk for EXPRESSBUILDER will be created.

Write-protect and attach a label, then keep it safely.

■ 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 3.5-inch floppy disk.
2. Start the Operating System.
3. Insert the EXPRESSBUILDER DVD into the CD-RW/DVD-ROM drive of the server.  
The Menu appears.
4. Click [Create drive disk] and select [OEM-Disk for Windows Server 2003].

---

**NOTE:** You can do the same operation using the menu that appears with a right-click.

---

5. Insert the floppy disk into the floppy disk drive according to the message.  
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.

6. Power on the system.
7. Insert the Windows Server 2003 CD-ROM into the CD-RW/DVD-ROM drive.
8. Press **Ctrl + Alt + Delete** to reset the system.

If a bootable operating system is 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.

Restart the server and perform this step again.

9. Press **F6** during the few seconds in which the window is in one of the following states.
  - "Setup is inspecting your computer's hardware configuration ..." is displayed.
  - A screen with a solid blue background is displayed.

---

**IMPORTANT:** There is no visible indication on screen when **F6** has been pressed.

---

10. When the following message is displayed, press **S**.

Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter. Currently, Setup will load support for the following mass storage device(s).

The following message is displayed.

Please insert the disk labeled  
manufacturer-supplied hardware support disk  
into Drive A:  
\*Press ENTER when ready.

11. Insert the Windows Server 2003 OEM-Disk for EXPRESSBUILDER into the floppy disk drive, and press **Enter**.

A list of mass storage devices is displayed.
12. Select the proper SCSI Adapter and press **Enter**.
  - LSI Logic MegaRAID SAS RAID Controller Driver (Server 2003 32-bit)Continue performing tasks according to the subsequent messages that appear.
13. When the following message is shown, press Enter to start "Welcome to Setup".
14. When the installation of Windows Server 2003 x64 Edition is finished, the system reboots automatically.
  - Windows Server 2003 has installed: Go on the step 13.
  - Windows Server 2003 R2 has installed: Go on the step 10.

15. The [Windows Setup] screen is displayed after logging 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.
- 

16. Insert Microsoft Windows Server 2003 R2 DISC 2 CD-ROM into the CD-RW/DVD-ROM drive. Confirm the parameters and click [OK].
17. When the installation has completed, remove Microsoft Windows Server 2003 R2 DISC 2 CD-ROM from the CD-RW/DVD-ROM drive, and restart the system. Make sure to execute the tasks described in "Driver Installation and Advanced Settings" and "Updating the System" of this manual.

### Procedure for License Authentication

The Product Key used in the procedure for license authentication should match the COA label in which the product key contained in Windows Server 2003 is written.

---

**NOTES:**

- Execute the activation within 30 days. The system may be locked once 30 days have passed.
  - The COA label may be attached to your server.
-

---

## Updating the System - Applying Service Pack -

Update the system in the below situations:

- Expanded the CPU (expanded to single processor to multi-processor).
- Modified the 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. We recommend this system update.

If you install the Windows Server 2003 CD-ROM which contains Service Pack 2, you do not have to apply "Hotfix for Windows" or "Hotfix for Windows Server 2003 (KB921411)".

Go on to the "Updating the System" section.

Perform "Updating the System" and apply the "Hotfix (KB921411)".

---

**IMPORTANT:** In the situations 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 with an account with administrator authority to the CPU blade (such as administrator).
2. Insert the EXPRESSBUILDER DVD into the CD-RW/DVD-ROM 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>

```
\001\win\winnt\dotnet\qfe\enu\kb921411.exe
```

<When the Simplified Chinese version of Windows Server 2003 R2 is used>

```
\001\win\winnt\dotnet\qfe\chs\kb921411.exe
```

<When the French version of Windows Server 2003 R2 is used>

```
\001\win\winnt\dotnet\qfe\fra\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, click [Finish] to restart the system.



With that, application process of the Hotfix (KB921411) is finished.

## Applying the "Updating the System" Process

"Updating the System" applies the drivers necessary for the NovaScale R480 E1 Series.

Follow this process after Hotfix for Windows x64 (KB921411) or Hotfix for Windows Server 2003 (KB921411) has been applied.

---

**NOTE:** If you install the Windows CD-ROM that contains Service Pack 2 to your system, you do not have to apply the Service pack 2 again.

---

1. Log on to the system using an account with administrator privileges (e.g.administrator).
2. Insert the EXPRESSBUILDER DVD into the CD-RW/DVD-ROM drive of server.  
The Windows Autorun Menu will be displayed
3. Left-click on [Setup], and then click [Update the system].

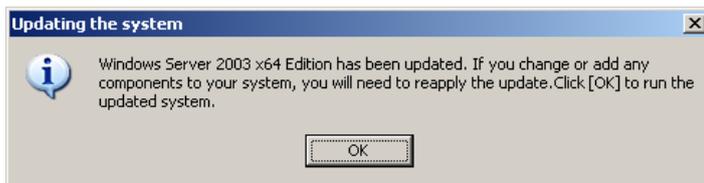
---

**NOTE:** You can also right-click the Autorun Menu.

---

Follow the on-screen messages to proceed to the application.

The [OK] dialog box is displayed.



---

**IMPORTANT:** During the "Updating the System" process, the following message may be shown, but there is no impact to the operation.

Do not click [cancel] since it disappears after a few seconds.



- 
4. Click [OK] to restart the system.
  5. Remove the EXPRESSBUILDER DVD from the CD-RW/DVD-ROM drive immediately when the system restarts.
  - 6.

## 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 the 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 the [Tools] and [Folder Options].
2. Select the [Files and Folders] - [Hidden files and folders] - [Show hidden files and folders] radio button from the Advanced settings in the [View] tab.
3. Check off the following check box in the [Files and Folders] from the Advanced settings in the [View] tab, and then click [OK].

Hide extensions for known file types

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 that the files exist.

Open the "<System drive:>\WINDOWS\system32\drivers" directory, and make sure that usbhub.sys and usbport.sys exist 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, the process is finished.

## DRIVER INSTALLATION AND ADVANCED SETTINGS

This section describes how to install and setup various standard drivers mounted on the device.

For any information on installing and setting up the driver that is not described in this section, please refer to the document attached to the driver.

---

### PROSet

PROSet is a utility that confirms the function of the network contained in the network driver.

Utilizing PROSet enables the following items:

- Confirm the detailed information of the adapter.
- Diagnose the loop back test, packet transmission test and so on.
- Setup the teaming.

Configuring several network adapters as one team provides the server with a fault-tolerant environment and enhances throughput between the switches.

PROSet is necessary to use these features.

Follow the procedure below to install PROSet.

9. Insert the EXPRESSBUILDER DVD into the CD-RW/DVD-ROM drive.
10. The [Windows Explorer] dialog starts.
11. Run "DXSETUP.EXE" in the following directory.  
    \001\win\winnt\w2k3amd\dl3\proset\winx64  
    The [Intel(R) PROSet - InstallShield Wizard] dialog starts.
12. Click [Next].
13. Choose "I accept the terms in the license agreement" and click [Next].
14. Choose "Typical" and click [Next].
15. Click [Install].
16. When the [InstallShield Wizard Completed] window is displayed, click [Finish].
17. Restart the system.

---

## Network Driver

Specify the details of the network driver.

The driver for the standard network board that is mounted will be installed automatically, but the link speed and duplex mode needs to be specified manually.

[When PROSet is not installed]

1. The [Local Area Connection Properties] dialog box appears.
  - \* Procedure using the standard start menu
    1. Click the Start menu, click [Control Panel], click [Network Connections], and click [Local Area Connection].
  - \* Procedure using the classic start menu
    1. Click the Start menu, click [Settings] and click [Network Connections].  
The [Network Connections] dialog box appears.
    2. Right-click [Local Area Connection] and click [Properties] from the pop-up menu.
2. Click [Configure].  
The property dialog box for the network adapter appears.
3. Click [Advanced] and specify a [Link Speed & Duplex] value identical to the value specified for the HUB.
4. Click [OK] on the properties dialog box for the network adapter.

[When PROSet is installed]

1. The [Intel PROSet] dialog box appears.
  - \* Procedure using the standard start menu  
Click Start menu, point to [Control Panel] and click [Intel PROSet].
  - \* Procedure using the classic start menu
    1. Click Start menu, point to [Settings] and click [Control Panel].
    2. Double-click [Intel(R) PROSet] on the [Control Panel] window.
2. Click [(Network Adapter Name)] in the list.
3. Click the [Speed] and specify the [Link Speed & Duplex Settings] value the same as the value specified for HUB.
4. Click [Apply] and click [OK].

Specify the other network driver using the above process.

You can also add or delete any protocols and services if necessary.

You can perform the same operation for the local area network which is displayed in [Network and Dial-up Connection].

---

**NOTE:** We recommend you to add "Network Monitor" at "Adding Services".

"Network Monitor" can monitor frames (or packets) sent or received by a computer on which "Network Monitor" is installed. This is an effective tool for analyzing network faults.

For more information about the installation procedure, see Chapter 6.

---

---

## **Installing Disk Array Controller Driver (LSILOGIC MEGARAID SAS 8480E)**

The Disk array controller driver will be installed automatically.

---

## **Installing SAS Controller Driver (LSISAS3443E-R)**

If you use the SAS controller driver (LSISAS3443E-R), update your system using the EXPRESSBUILDER DVD attached to your system.

The SAS controller driver will be installed automatically.

## About Windows Activation

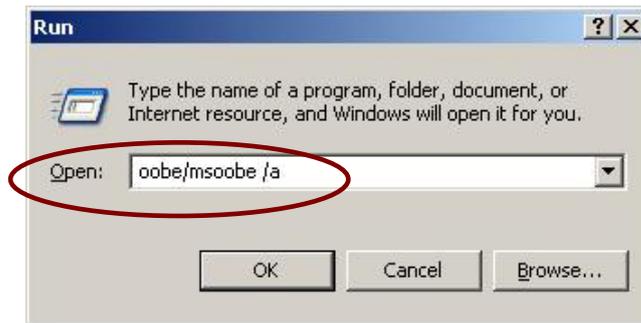
Windows Server 2003 must be activated before you can use Windows Server 2003.

Windows activation process is as follows.

1. Click [Run] in the [Start] menu.

Type the following in the [Open:] box, and click [OK].

oobe/msoobe /a



2. When the screen below appears, click [Next].



The following screen is displayed.

Generating new Installation ID...

3. Process with the "Windows activation" according to the following message.



---

## Available Switch Options for Windows Server 2003 Boot.ini file

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

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

- Microsoft Knowledge Base - Article ID: 833721

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

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

However, the Microsoft operating system products which support /PAE switch option are limited.

Refer to the following article in Microsoft Knowledge Base to check the supported products.

- Microsoft Knowledge Base - Article ID: 291988

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

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

1. Click [Start], point to [Settings], and then click [Control Panel].
2. In the [Control Panel], double-click [System].
3. Click the [Advanced] tab, and then click [Settings] under [Setup and Recovery].
4. Under [System Setup], click [Edit] to open [Boot.ini].
5. Add the "/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
```

---

**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.

---

## **SETTINGS FOR THE MEMORY DUMP COLLECTION (DEBUG INFORMATION)**

Set the memory dump collection using the procedure described in Chapter 5.

# Appendix F

## 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 A						
Slot #1	Size		Serial No.		Date Installed	
Slot #2	Size		Serial No.		Date Installed	
Slot #3	Size		Serial No.		Date Installed	
Slot #4	Size		Serial No.		Date Installed	
Slot #5	Size		Serial No.		Date Installed	
Slot #6	Size		Serial No.		Date Installed	
Slot #7	Size		Serial No.		Date Installed	
Slot #8	Size		Serial No.		Date Installed	
Memory B						
Slot #1	Size		Serial No.		Date Installed	
Slot #2	Size		Serial No.		Date Installed	
Slot #3	Size		Serial No.		Date Installed	
Slot #4	Size		Serial No.		Date Installed	
Slot #5	Size		Serial No.		Date Installed	
Slot #6	Size		Serial No.		Date Installed	
Slot #7	Size		Serial No.		Date Installed	
Slot #8	Size		Serial No.		Date Installed	
Memory C						
Slot #1	Size		Serial No.		Date Installed	
Slot #2	Size		Serial No.		Date Installed	
Slot #3	Size		Serial No.		Date Installed	
Slot #4	Size		Serial No.		Date Installed	
Slot #5	Size		Serial No.		Date Installed	
Slot #6	Size		Serial No.		Date Installed	
Slot #7	Size		Serial No.		Date Installed	
Slot #8	Size		Serial No.		Date Installed	

Memory D						
Slot #1	Size		Serial No.		Date Installed	
Slot #2	Size		Serial No.		Date Installed	
Slot #3	Size		Serial No.		Date Installed	
Slot #4	Size		Serial No.		Date Installed	
Slot #5	Size		Serial No.		Date Installed	
Slot #6	Size		Serial No.		Date Installed	
Slot #7	Size		Serial No.		Date Installed	
Slot #8	Size		Serial No.		Date Installed	
Monitor						
	Type		Model name		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	Size		Capacity		Serial No.	
(Optional)	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	
Additional Cabinet for Disk						
	Model name				Serial No.	
					Date Installed	
External Peripheral Device 1						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 2						
	Model name				Serial No.	
	Manufacturer				Date Installed	
Display						
	Model name				Serial No.	
	Manufacturer				Date Installed	
Keyboard						
	Model name				Serial No.	
	Manufacturer				Date Installed	
Mouse						
	Model name				Serial No.	
	Manufacturer				Date Installed	



