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Text Conventions


This guide uses the following text conventions.

Warning

Warnings alert you to situations that could result in serious personal injury or loss of life.

Caution

Cautions indicate situations that can damage the system hardware or software.

 *Note: Notes give important information about the material being described.*

- Names of keyboard keys are printed as they appear on the keyboard. For example, **Ctrl**, **Alt**, or **Enter**.
- Text or keystrokes that you enter appear as boldface type. For example, type **abc123** and press **ENTER**.
- File names are printed in uppercase letters. For example, **AUTOEXEC.BAT**.

Safety Notices

Caution

To reduce the risk of electric shock which could cause personal injury, follow all the safety notices.

Symbols are shown in your documentation and on your equipment to indicate safety hazards.

Regulatory Information

European Notice

Products with the CE marking comply with both the Electromagnetic Compatibility Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) - modified by the Directive 93/68/EEC - issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Standards:

- EN55022: Radio Frequency Interference
- EN55024 (1998+A1:2001): Immunity characteristics
- EN6100-3-2: Limits for harmonic current emissions
- EN6100-3-3: Limitation of voltage fluctuation and flicker in low-voltage supply system
- EN60950-1 (2001): Product Safety

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).

If your system includes a telecommunication network board, the input/output socket is classified as Telecommunication Network Voltage (TNV-3).

USA and Canada Notice

Products with UL marking comply with the following UL standards:

- UL 1950 (3rd edition 1998)

Products with FCC marking comply with the following FCC standards

- FCC part 15

The model type/ref. used for UL and FCC certification can be found on the regulatory labels stuck on your system.

The equipment has been tested and found to comply with the limits for a Class A or B 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.

Modifications to the Product

CE and FCC Marking

We cannot be held responsible for modifications made by the User and the consequences thereof, which may alter the conformity of the product with the CE or FCC Marking.

Connections and Remote Earths

PELV (Protected Extra Low Voltage)

To ensure the extra-low voltage integrity of the equipment, only connect equipment with mains-protected electrically-compatible circuits to the external ports.

SELV (Safety Extra Low Voltage)

Every input and output of this product is classified as Safety Extra Low Voltage.

Remote Earths

To prevent electrical shock, connect all local (individual office) systems and system support equipment to the same electrical circuit of the building wiring. If you are unsure, check the building wiring to avoid remote earth conditions.

Building Supply

Only connect the equipment to a building supply that is in accordance with current wiring regulations in your country. In the U.K., those are the IEE regulations.

Power Supply and Cables

Power Supply

- The DC push-button on/off switch on the front panel does not turn off the system AC power. +5vdc is present on the motherboard whenever the AC power cords are connected between the system and an AC outlet. Before doing the procedures in this manual, make sure that your system is powered off and unplug the AC power cords from the back of the chassis. Failure to disconnect power before opening your system can result in personal injury and equipment damage.
- Under no circumstances should the user attempt to disassemble the power supply. The power supply has no user-replaceable parts. Inside the power supply are hazardous voltages that can cause serious personal injury. A defective power supply must be returned to your dealer.

Cables

- In the U.S.A. and Canada, the power cord must be a UL-listed detachable power cord (in Canada, CSA-certified), type ST or SJT, 16 AWG, 3-conductor, provided with a moulded-on NEMA type 5-15 P plug cap at one end and a moulded-on cord connector body at the other end. The cord length must not exceed 9 feet (2.7 meters).
- Outside the U.S.A. and Canada, the plug must be rated for 250 VAC, 10 amp minimum, and must display an international agency approval marking. The cord must be suitable for use in the end-user country. Consult your dealer or the local electrical authorities if you are unsure of the type of power cord to use in your country. The voltage change occurs via a switch in the power supply.
- The detachable power supply cords are intended to serve as the disconnect devices.
- For PLUGGABLE EQUIPMENT, the socket-outlet shall be installed near the equipment and shall be easily accessible.
- This equipment has a 3-wire, grounded power cords. To prevent electrical hazards, do not remove or defeat the ground prong on the power cords. Replace a power cord if it gets damaged. Contact your dealer for an exact replacement.

Batteries

Lithium batteries can be dangerous. Improper handling of lithium batteries may result in an explosion. Dispose of lithium batteries as required by local ordinance. Also [see “Product Disposal” on page 14](#)

Chassis Cover Removal and Replacement

When servicing your system, make sure to replace the chassis cover and secure it with the screws before plugging in the power cable and turning it on. The chassis cover ensures proper airflow and cooling.

Laser Compliance Statement

The optical devices are tested and certified to be compliant with International Electrotechnical Commission IEC60825-1 and European EN60825-1 standards for Class 1 laser products.

Class 1 laser products are not considered hazardous. The optical devices are designed such that there is never human access to laser radiation above a Class 1 level during normal operation or prescribed maintenance conditions.

The optical devices installed in your system is designed for use solely as a component of such electronic product and therefore does not comply with the appropriate requirements of Code of Federal Regulation Sec. 1040.10 and Sec. 1040.11 for **COMPLETE** laser products

Warning - Hazardous Voltage!

Hazardous voltage is present inside your system when it is connected to an AC supply even when the system's power switch is off. Exposure to Hazardous Voltage could cause personal injury. To reduce the risk of electric shock which could cause personal injury, follow all safety notices. The symbols shown are used in your documentation and on your equipment to indicate safety hazards.

Warning -Avoid Electrostatic Discharge!

Circuit cards and integrated circuits can be easily damaged by static electricity. To reduce risk of damage, store them in protective packaging whenever they are not installed in your system.

Before you install or remove memory modules, video memory, disk drives, circuit cards or other devices, protect them from static electricity. To do so, make sure your system's power switch is **OFF**. Then, unplug the system's AC power cord(s). Wear an anti-static wrist strap (available at electronic supplies stores) to handle the device you want to install. Be sure to connect the wrist strap to an unpainted metal portion of the system chassis.

As an alternative, you can dissipate electrostatic buildup by touching an unpainted metal portion of the system chassis with one hand. Handle the device you are installing with the other hand, and maintain continuous contact with the unpainted portion of the chassis until it is installed in the system.

Product Disposal



The Waste Electrical and Electronic Equipment (WEEE) Directive requires that used electrical and electronic products must be disposed of separately from normal household waste in order to promote reuse, recycling and other forms of recovery and to reduce the quantity of waste to be eliminated with a view to reduce landfill. WEEE includes accessories such as keyboard, mouse, remote control, speakers, etc. When you dispose of such products, please follow the agreement made between you and us and/or your distributor.

Using This Guide

This user guide provides a reference to information about the Bull NovaScale T860 server. Its goal is to familiarize you with your system and the tasks necessary for system configuring and upgrading.

- Chapter 1 contains information about the front, back and internal features of your system and about the motherboard. It lists the standard and optional features of your server and provides information about the rack version of your server.
- Chapter 2 helps you installing the server in an appropriate place, making connections and starting using your server.
- Chapter 3 shows you how to configure your server and helps you set up the various options.
- Chapter 4 provides the information you need to remove components from your system and install new ones. You will find in this chapter how to install hard disk drives, upgrade memory, install optical devices... etc.
- Chapter 5, gives you information about how to solve the various issues you may encounter with your system.

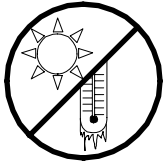
Related Documents

In addition to this User Guide, several other documents are included with your system either as electronic files (on the ExpressBuilder CD-ROM) or as paper copy shipped with your server.

We recommend you read these additional documents as it becomes necessary when setting up, using or upgrading your server system.

Care and Handling

Use the following guidelines to properly handle and care for your system.



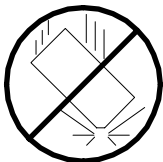
Protect the system from extremely low or high temperatures. Let the system warm (or cool) to room temperature before using it.



Keep the system away from magnetic forces.



Keep the system dry. Do not wash the system with a wet cloth or pour fluid into it.



Protect the system from being bumped or dropped.



Check the system for condensation. If condensation exists, allow it to evaporate before powering on the system.



Keep the system away from dust, sand, and dirt.

Overview

The Bull NovaScale T860 is a modular, multiprocessing server based on the Intel® Xeon™ microprocessor family. It is a solid performer and offers the latest technology. The combination of compute performance, memory capacity, and integrated I/O provides a high performance environment for many server market applications. These range from large corporations supporting remote offices to small companies looking to obtain basic connectivity capability such as file and print services, e-mail, web access, web site server, etc.

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

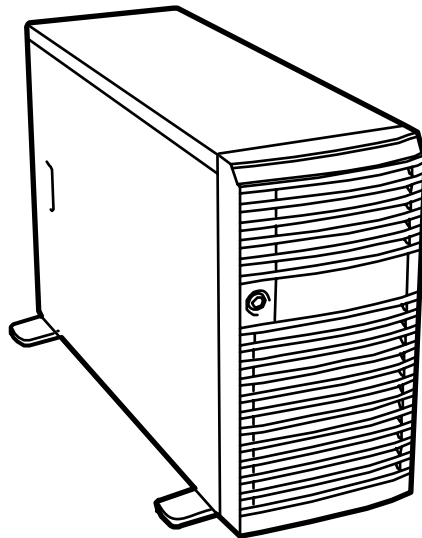


Figure 1: Tower-based Front View

Your server may include hot-swap SAS hard disk drive bays. The hot-swap SAS hard disk drive bays hold up to four 1.0-inch SAS hard disk drives that can be swapped in or out of the system without powering it down (when RAID is configured in the system), plus another four disks in an optional hard disk drive cage.

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

System Chassis Features

Front View

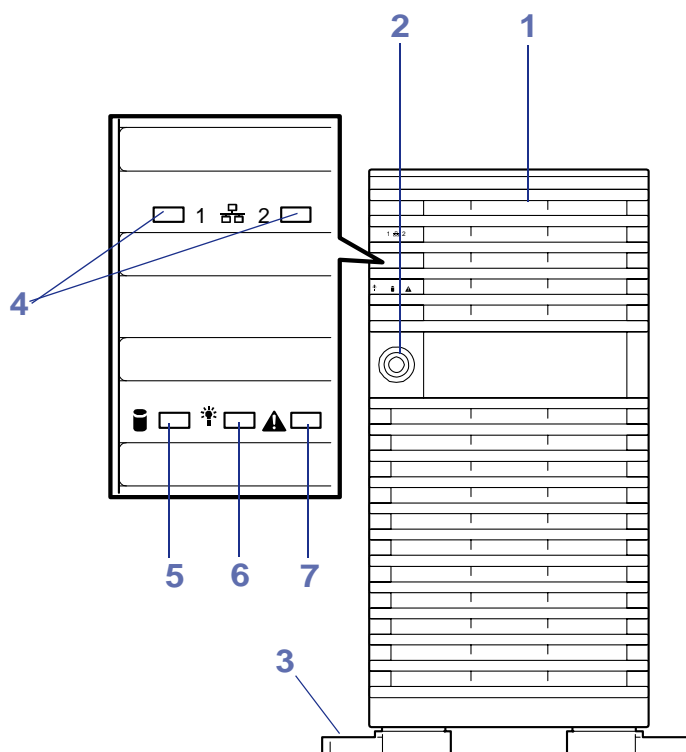


Figure 2: Front View (Door Closed)

- 1 Front door**
Open this door to access the POWER switch, 5.25-inch devices, the optical disc drive, to install/remove hard disks to 3.5-inch bays, or to connect USB devices. You can lock the front door using the provided security key.
- 2 Key hole**
Insert the security key to lock/unlock the front door.
- 3 Stabilizers**
Use the four stabilizers to prevent the server from falling down.
- 4 LAN ACCESS lamp (green)**
Lights in green while the server is connected to the network. Blinking in green indicates the network activity. Numbers printed near the lamps indicate the LAN port number.
- 5 DISK ACCESS lamp (green/amber)**
Lights in green while the internal hard disk is in access. When any one of the internal hard disks fail, this lamp lights in amber.
- 6 POWER/SLEEP lamp (green)**
Lights green when the server is powered on. Flashes green to indicate that the system is in sleep mode. Turns off when the server is powered off.
- 7 STATUS lamp (green/amber)**
Lights in green while the server is in successful operation. When any error is detected, this lamp lights in amber.

Front View (Door Opened)

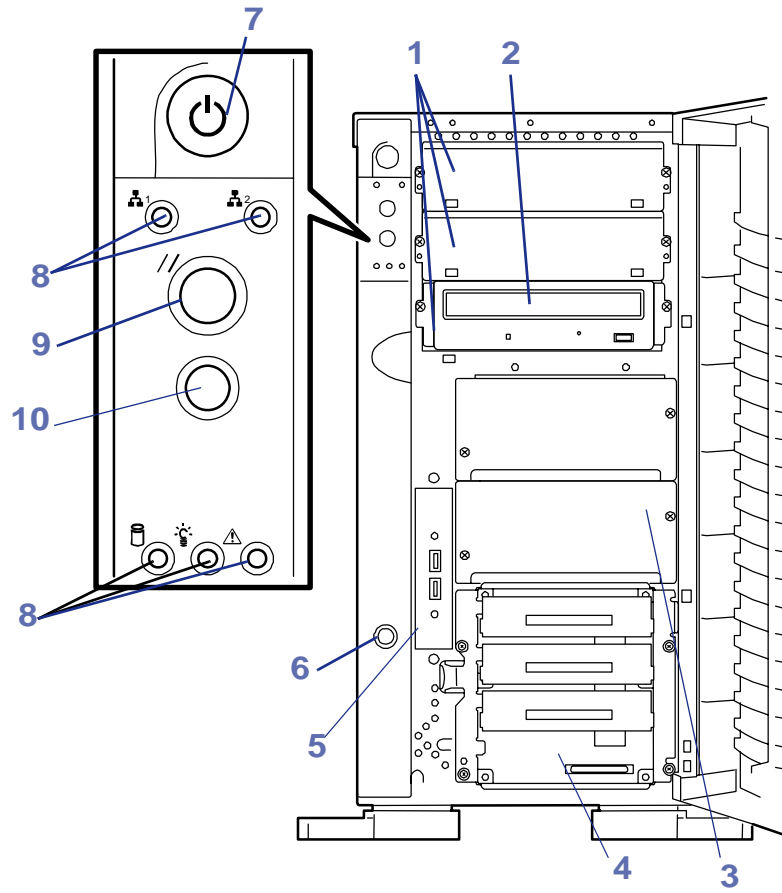


Figure 3: Front View (Door Opened)

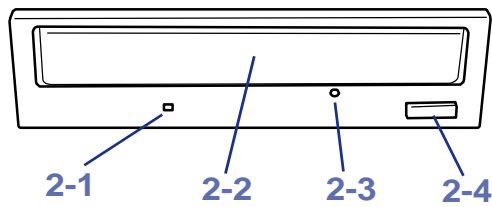


Figure 4: DVD-ROM Drive

1 5.25-inch device bay

Backup tape drives may be installed in the 5.25-inch device bay.

2 Optical disc drive

The optical disc drive reads data from the inserted optical disc.
(Depending on your hardware configuration, a DVD-ROM or a CD R/W drive may be installed.)

2-1 Access lamp (lights in amber while being accessed)

2-2 Optical disc slot

2-3 Emergency hole

2-4 Open/Close button

3 Additional HDD cage bay

This bay allows you to install four additional disk drives in the server.

4 3.5-inch hard disk drive bay

The 3.5-inch hard disk drive bay contains up to four hard disks. Hard disks having the thickness of 1 inch can be inserted into the slots.

The disk slots are numbered sequentially from bottom to top. Empty trays are installed in the slots not fitted with hard disk drives.

The SCSI IDs are defined as follows: ID0 to ID5 from bottom to top.

5 USB connectors

The USB connectors allow the server to connect to USB devices.

6 Cover open sensor

The cover open sensor detects the open of the front door.

7 Power switch

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

8 Lamps**9 Reset switch**

The reset switch is used to reset the server.

10 Dump switch (NMI switch)

Non-maskable Interrupt switch.

The dump switch is used to collect the event logs having occurred in the server.

Rear View

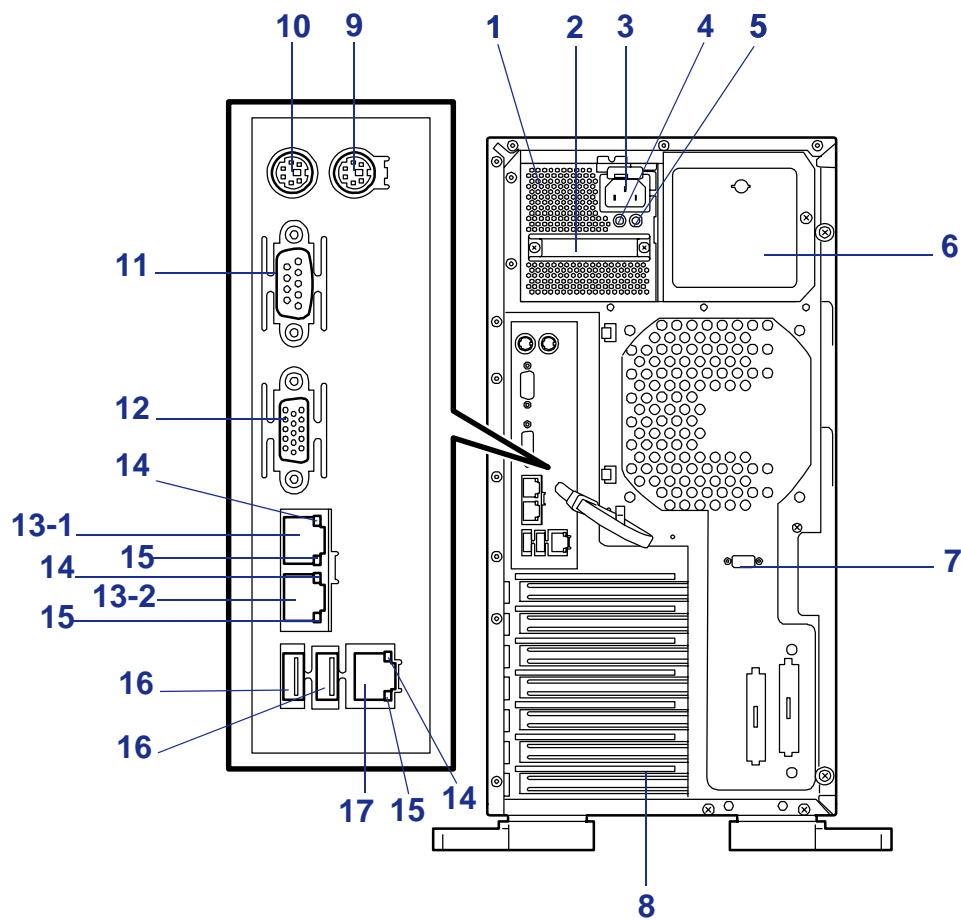


Figure 5: Rear View

- 1 **Power supply**
The power unit supplies DC powers to the server.
- 2 **Handle**
Grasp this handle install or remove the power supply.
- 3 **AC inlet**
The AC inlet is connected with the power cord.
- 4 **Power lamp**
The Power lamp blinks green if the power supply receives the AC power through the power cord.
The lamp goes on green when the power of the server is turned on.
- 5 **Power fail lamp**
The amber lamp goes on if the power is defective.
- 6 **Additional power supply slot**
An optional power supply may be installed on the slot.
- 7 **Serial port B connectors**

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

8 Additional PCI board slots

Optional PCI boards may be inserted into the slots.

9 Mouse connector

The mouse connector is connected with the mouse coming with the server.

10 Keyboard connector

The keyboard connector is connected with keyboard coming with the server.

11 Serial port A connector

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

12 Monitor connector

The monitor connector is connected with the display unit.

13 LAN connector(s)

The LAN connectors are connected with a network system on LAN. The value following the bold-faced number indicates the port number. Your server supports 1000BASE-T/100BASE-TX/10BASE-T network subsystem.

14 Link/ACT lamp

The Link/ACT lamp shows the LAN access status.

15 Speed lamp

Indicates the LAN transfer rate.

16 USB-1 and USB-2 connectors

The USB-1 and USB-2 connectors are connected with devices accepting the USB interface. Connector 1 to connector 2 are assigned from right to left.

17 Management LAN port (100BASE-TX/10BASE-T)

Internal View

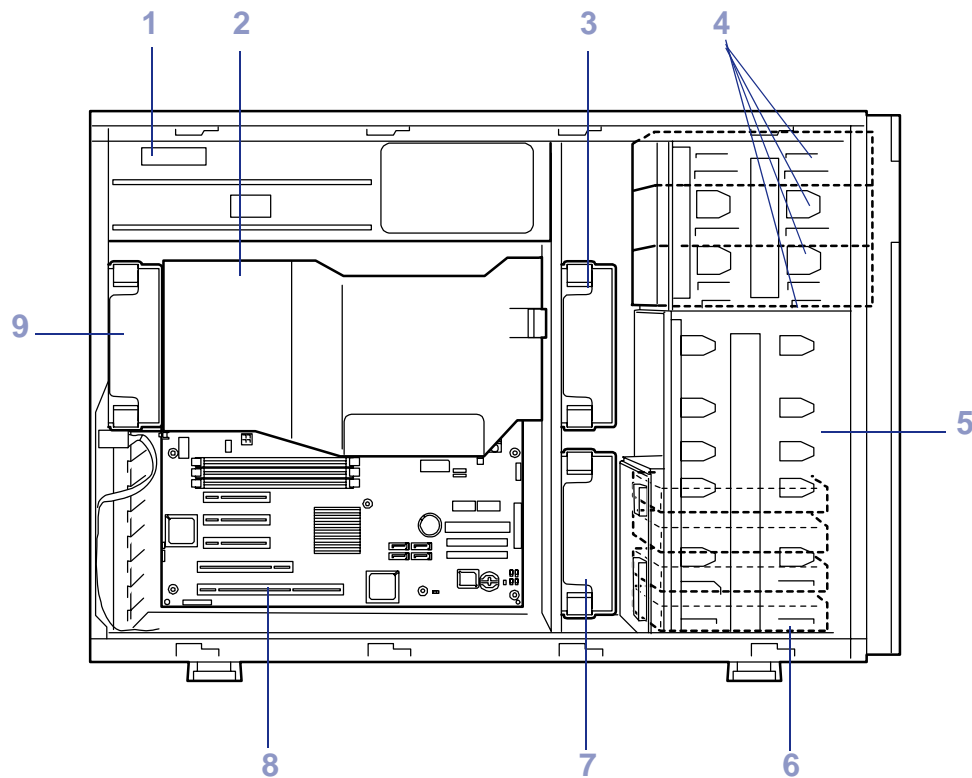


Figure 6: Internal View

- 1 **Power supply**
- 2 **Duct cover**
- 3 **Front cooling fan (Factory-installed)**
- 4 **5.25-inch device bays (four slots)**
An optical disc drive is installed in slot #3.
- 5 **HDD cage slot**
An optional HDD cage can be installed.
- 6 **3.5-inch hard disk drive bay**
The hard disk drive bay can hold up to four 1.0-inch hot-swap SCSI hard disk drives.
- 7 **Cooling fan (option)**
- 8 **Motherboard**
- 9 **Rear cooling fan unit (Factory-installed)**

Motherboard

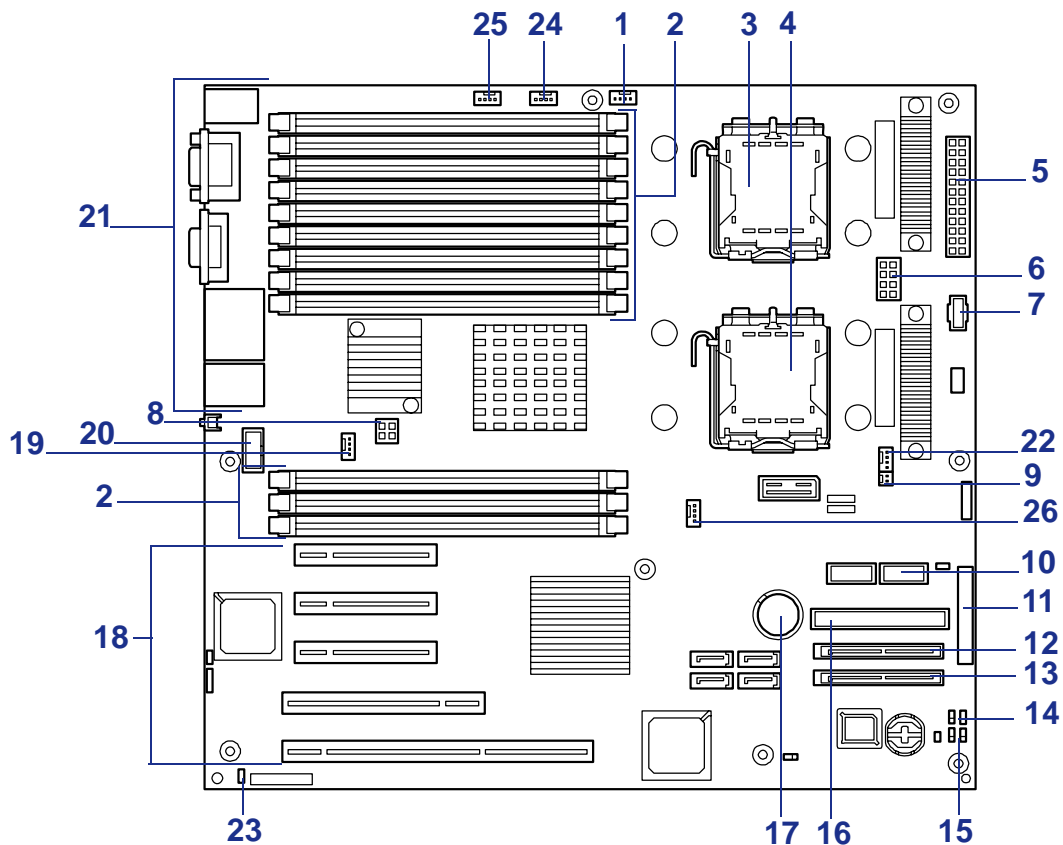


Figure 7: Motherboard

- 1 Front cooling fan connector
- 2 DIMM sockets
Slots are numbered 33, 32, 31, 23, 22, 21, 13, 12, 11, 41, 42, and 43 from top to bottom.
Add two DIMMs at a time (this DIMM installation unit is called a group).
- 3 Processor 1 socket
- 4 Processor 2 socket
- 5 Power connector
- 6 Power connector
- 7 Power signal connector
- 8 Power connector
- 9 Cooling fan signal connector (when using an optional redundant fan)
- 10 Front USB connector
- 11 Front panel interface connector
- 12 SAS 2 connector
- 13 SAS 1 connector
- 14 Jumper switch for clearing CMOS
- 15 Jumper switch for clearing BIOS password
- 16 IDE connector (for optical disc drive)
- 17 Lithium battery
- 18 PCI boards slots

Slots are numbered PCI#1, PCI#2, PCI#3, PCI#4 and PCI#5 from bottom to top.
PCI#1: 64-bit, 100MHz
PCI#2: 32-bit, 33MHz
PCI#3 to 5: PCI EXPRESS (8-bus)

19	Rear cooling fan connector
20	Serial Port B connector
21	Connectors for external devices
22	Cooling fan connector (when using an optional redundant fan) / Water cooling pump connector
23	Side cover open sensor connector
24	Water cooling unit connector
25	Water cooling unit connector
26	Water cooling unit connector

Xeon™ Processors

Depending on system configuration, each system includes one or two Intel Xeon processors. Each processor includes a minimum of 4 MB L2 cache memory. When two processors are installed, both processors must be of identical bus and core speed.

The processor external interface operates at a minimum of 1.6 GHz.

Memory

The motherboard contains twelve DIMM sockets. Memory is partitioned as four banks of registered SDRAM DIMMs (DDR-533 compatible) that must be populated in pairs, each providing 72 bits of buffered two-way interleaved memory (64-bit main memory plus ECC). Your system may include from 2 GB (2 x 1 GB) to 48 GB (12 x 4 GB) of memory.

PCI Riser Slots

The server's expansion capabilities meet the needs of file and application servers for high performance I/O by providing PCI expansion slots.

- Three PCI Express (x 8) slots.
- One 64-bit/100MHz PCI-X slot.
- One 32-bit/33MHz PCI slot.

Video Controller

The motherboard uses a Server Engines Pilot Graphics Accelerator with 2 MB of NVRAM memory.

The motherboard supports disabling of the onboard video through the BIOS setup menu or when a plug in video card is installed in any of the PCI slots.

SAS Controller

The motherboard contains an embedded SAS controller that can be configured in RAID or non-RAID (JBOD) mode.

Warning

The SAS ROMB (RAID On MotherBoard) feature requires 22 kB of conventional memory. This reduction in memory is known to cause a problem when using the Boot-On-LAN feature with the Microsoft Remote Installation Service (RIS). The following message will be displayed:

Windows NT has found only 509K of low memory. 512K of low memory is required to run Windows NT. You may need to upgrade your computer or run a configuration program provided by the manufacturer.

If Microsoft RIS is required to be used on this server, then it is necessary to run with SAS ROMB disabled (see “Enabling the RAID Feature” on page 91) or use additional hardware to provide the RAID functionality (LSILogic MegaRAID SAS 8408E or LSI MegaRAID SAS ZCR 8300XLP).

Network Controller


The motherboard uses a dual-channel Ethernet Controller and supports 10Base-T/100Base-TX/1000Base-T network subsystems.

Keyboard and Mouse Controller

The keyboard/mouse controller is PS/2-compatible.

ACPI

The Advanced Configuration and Power Interface (ACPI) aware operating system can place the system into a state where the hard drives spin down, some system fans stop, and all processing is halted. However, in this state the power supply is still on and the processors are still dissipating some power such that the power supply fan and some system fans are still running.

 *Note: ACPI requires an operating system that supports its feature.*

This server system BIOS supports sleep states s0, s1, s4, and s5.

 **Caution**

Only when the AC power is disconnected is the system completely off.

The sleep states are defined as follows:

- s0: Normal running state.
- s1: Processor sleep state.
No context will be lost in this state and the processor caches will maintain coherency.
- s4: Hibernate or Save to Disk.
The memory and machine state are saved to disk. Pressing the power button or other wake up event restores the system state from the disk and resumes normal operation. This assumes that no hardware changes have been made to the system while it was off.
- s5: Soft off.
Only the RTC section of the chip set and the BMC are running in this state.

Standard Features

- Dual-core 64-bit Intel® Xeon™ Processor
- High-speed 1000BASE-T/100BASE-TX/10BASE-T interface (1000Mbps/100Mbps/10Mbps supported)
- High-speed disk access (SAS)
- USB 2.0
- Memory monitoring feature (single-bit error correction/double bit error detection)
- Memory redundant feature (mirroring, sparing)
- CPU/memory/cooling fan degradation feature (logical isolation of a failed device)
- Bus parity error detection
- Temperature detection
- Error notification
- Internal CPU fan monitoring feature
- Internal voltage monitoring feature
- Redundant power supplies (hot-swap)
- Disk array (option)
- Auto-rebuild feature (hot-swap)
- BIOS password feature
- Security feature (security lock)
- NEC ESM PRO
- NEC DianaScope
- Disk array utilities
- Remote monitoring with NEC ExpressScope
- Sleep feature (Windows 2003)
- Wide variety of optional I/O slots
 - Three PCI EXPRESS (8-bus) slots
 - One 64-bit, 100MHz PCI-X slot
 - One 32-bit, 33 MHz PCI slot
- 1 GB to 48 GB of DDR533 SDRAM two way interleaved memory, using up to twelve DIMMs
- Two network ports and one management LAN port
- Remote power-on feature
- Up to two Intel® Xeon™ processors
- Two hot-plug power supplies (Redundancy)
- USB 2.0 supported
- Convert to rack-mount type
- Graphic accelerator "Pilot" support
- El Torito Bootable DVD-ROM (no emulation mode) format support
- POWER switch mask
- Software power-off
- Remote power-on feature
- AC-LINK feature
- Intelligent Platform Management Interface (IPMI)
- Remote Management Card (option)
- Remote console feature


- Power On Self-Test (POST)
- Test and Diagnosis
- ExpressBuilder (system setup utility)
- SETUP (BIOS SETUP utility)

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

Power Supply

The system contains one auto-sensing 570-watt power supply at an operating frequency of 50/60 Hz.

A second optional power supply may be added as part of a fault-tolerant hot-swap design. With two power supplies installed, in the unlikely event of a power supply failure, the load is transferred to the remaining power supply without interruption to normal operation. In this case the faulty power supply can be replaced without powering down the system.

 *Note: The power supplies are not hot-swappable unless there are two power supplies installed.*


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

Peripheral Bays

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

- A 3.5-inch front panel bay for installing the standard 3.5-inch floppy disk drive (supports 720 KB and 1.44 MB floppy disk media)
- Four 5.25-inch device bays for installing half-height or full-height 5.25-inch peripheral devices such as an optional tape drives or an optional three SCSI hard disk drive bays for installing up to six SCSI hard disk drives.
- The SCSI hard disk drive bays for installing up to six SCSI hard disk drives.

The SCSI disk drives can be easily installed or removed. The drive carrier allows you to access to disk drives from the front of the system. If disk drives are provided with RAID configuration within the system, a disk drive can be swapped with another without power interruption in the system (hot-swap).

 *Note: The SCSI hard disk drive bays contain a hot-swap back plane that require an 80-pin single connector attachment (SCA) connector on the drives that you install.*

Degradation Feature

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

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

Remote Power-On Feature (Wake On LAN)

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

To enable this feature, refer to the BIOS setup utility, [*“Utilitaire Setup du BIOS” on page 73.*](#)

The remote power-on feature is not available in the following cases:

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

AC-LINK Feature

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

NEC ESMPRO

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

Off-line Maintenance Utility

The Off-line Maintenance Utility is used for maintenance and fault analysis of the server. This utility is used by the service representative.

System Diagnostic Utility

The system diagnostic utility contained in the ExpressBuilder is useful to detect the hardware failures.

NEC DianaScope

The NEC DianaScope is a software for the remote management of the BULL NovaScale series. The NEC DianaScope can control the managed server even if OS is not running on the managed server. To use the NEC DianaScope, you need to purchase the separately priced server license.

See the online document in the ExpressBuilder CD-ROM.

Security

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

Security with Mechanical Locks and Monitoring

The front door of the server contains a mechanical lock to prevent access to the front of the computer chassis.

The computer chassis includes an intrusion switch for the front cover and intrusion/interlock switches for the right side door (as viewed from the front). When any these covers are opened, the switch transmits an alarm signal to the motherboard, where server management software processes the signal. The side cover switch also operates as interlock switch.

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 - 2 to 120 minutes.
- Set and enable an administrative password.
- Set and enable a user password
- Set secure mode to prevent keyboard or mouse input and to prevent use of the front panel reset and power switches.
- Activate a hot-key combination to enter secure mode quickly.

ExpressBuilder CD-ROM

Please setup the server using the ExpressBuilder CD-ROM both when setting it up for the first time, and when you make changes to its configuration.

With the ExpressBuilder CD you can:

- Install the Operating System, using the Express Setup.
- Diagnose the system, using the System Diagnostics tool.
- Create a support disk; this disk will be used to manually install a Microsoft operating system.
- Update the BIOS or the server firmware.
- Update a Microsoft operating system, using the “Update BULL NovaScale System” feature of the Master Control menu (available from the windows-based ExpressBuilder).
- Install utilities, such as management software for Windows (NEC ESMPRO, NEC Dianascope, etc.), and DOS-based maintenance utilities (System Diagnostics, Off-line Maintenance Utility, etc.). Windows-based applications are installed via the Master Control menu, whereas DOS-based utilities are installed via the Tools menu. Refer to the appendices for more information.
- Read the on-line documentation (Windows systems only).

 *Note: Some of the above features can be performed remotely using a cross cable (COM) or LAN.*

Software End-User License Agreement

Carefully read the terms and conditions of the Software End User License Agreement printed on the ExpressBuilder CD-ROM sleeve.

Setting Up the System

Overview


This chapter describes how to select a site, unpack the system, make cable connections, and power on the system units. Information on front and rear panel features, switches and LEDs are also included in this chapter.

Selecting a Site

The system operates reliably in a typical office environment.

Choose a site that is:

- Near grounded, three-pronged power outlets.

 *Note: For the United States and Canada, this means a NEMA 6-15R outlet for 200-240 VAC. The system cannot be used on a NEMA 5-15R outlet for 100-120 VAC. For other international sites, this means three-pronged power outlets applicable for the electrical code of the region.*

Warning

Be sure the power service connection is through a properly grounded outlet.

- Clean, dust-free, and well ventilated. Every side ventilating openings kept free of obstructions. Away from sources of heat, vibration or physical shock.
- Isolated from strong electromagnetic fields and electrical noise produced by electrical devices (such as air conditioners, large fans, large electric motors, radio and TV transmitters, and high-frequency security devices)
- Spacious enough around the server to allow proper cooling, airflow, and cable clearance.

Caution

Make sure to leave enough space behind the server. Not doing so may result in overheating and damaging the server.

- Easily accessible for server maintenance and installation of server upgrades.

Unpacking the System

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

Warning

The hot-swap system can weigh up to 38 kg. If the system contains numerous optional boards and peripheral devices, it will weigh more. To avoid personal injury, make sure you have someone help you lift or move the server.

Rack Version

This section provides instructions for assembling the rack-mount server into a standard EIA 19-inch rack cabinet.

Unpacking the Rack Mounting Hardware

Although the rack mounting hardware is inspected and carefully packaged at the factory, damage may occur during shipping.

To unpack the rack mounting hardware:

1. Inspect the shipping containers and notify your carrier immediately of any damage.
2. Carefully remove the rack mounting hardware and check the parts (see the following figure and table).
If parts are missing or the hardware is damaged, notify your server representative.

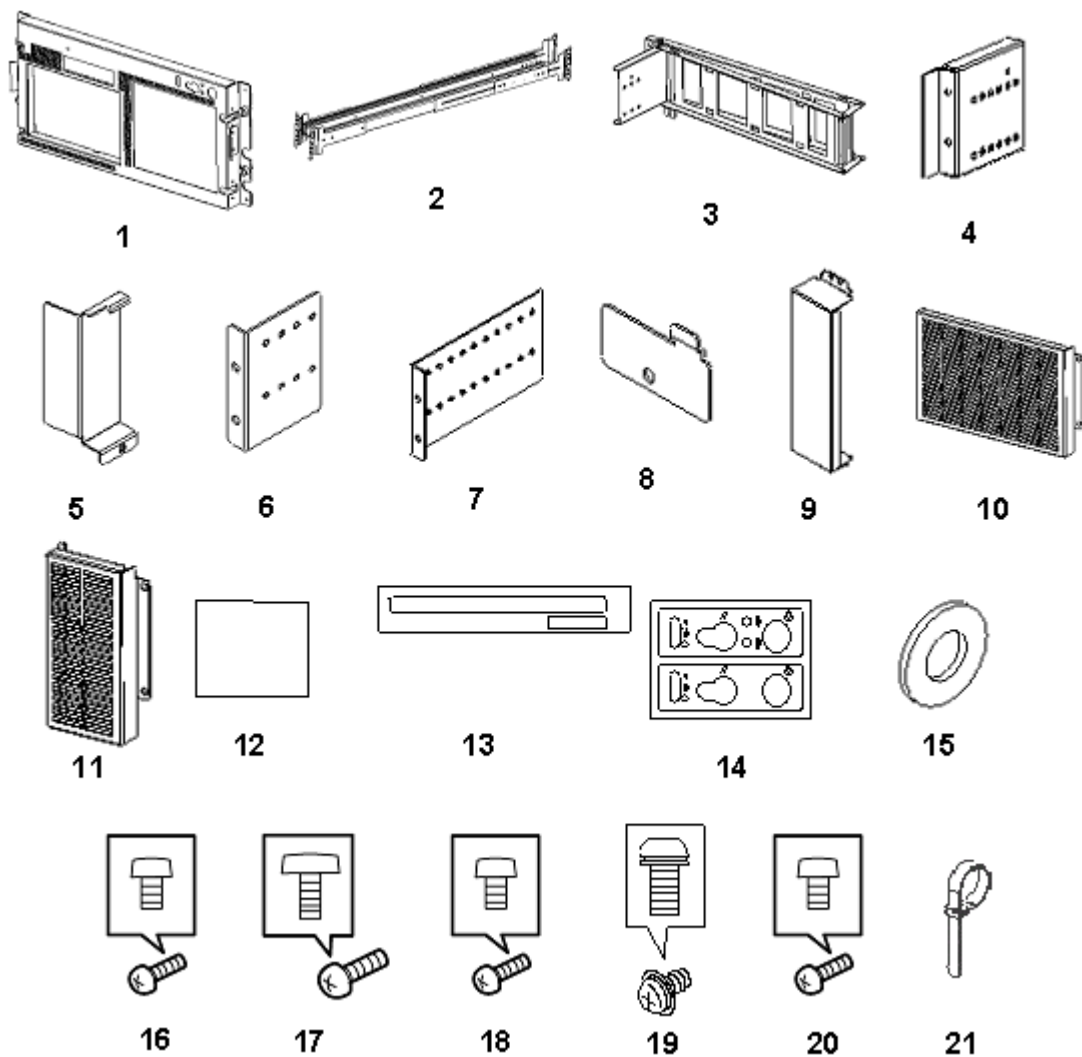


Figure 8: Rack Mounting Hardware

Table 1: Rack Mount Parts

Reference	Part Name	QTY	Notes
1	Front Bezel	1	
2	Slide Rail Assembly	2	
3	Cable Retention Arm	1	
4	Cable Arm Bracket	1	
5	Cable Arm Stopper	1	
6	Adapter Bracket (1)	1	Used when the distance between the front and rear vertical mounting rails is from 700 to 742mm
7	Adapter Bracket (2)	1	Used when the distance between the front and rear vertical mounting rails is from 745 to 900mm
8	Stabilizer Cover	4	
9	Device Cover	3	For the 5.25" device bay
10	HDD Cover (1)	1	Used on models equipped with fixed HDDs
11	HDD Cover (2)	1	Used on models equipped with hot-swap HDDs
12	Template	1	
13	Model Name Label	1	
14	Icon Label	1	
15	Washer	8	Used to secure the slide rail assemblies
16	Screw A	8	M4 bind-head screws (color: gold)
17	Screw B	10	M5 bind-head screws
18	Screw C	8	#6-32 UNC pan-head screws (color: silver)
19	Screw D	11	M4 pan-head screws with washer (color: gold)
20	Screw E	12	M4 cross-recessed pan-head screws used with racks equipped with non-"L" shaped vertical mounting rails
21	Cable Tie	10	

Before Installing the Server into a Rack

Warning

- Be sure that power to the server is turned off and unplugged. All voltage is removed only when the power cords are unplugged.
 - Do not use any rack which does not conform to the relevant standard.
 - Avoid excessive vibration and shock. Dropping an electronic component can cause serious damage.
 - Do not install the server on the rack leaving the right side door removed.
 - Do not disconnect or remove parts other than those specified in the procedure.
 - Do not touch I/O connector pins.
-

Restricted Access Location

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

Static Precautions

An electrostatic discharge (ESD) can damage disk drives, option boards, and other components. You can provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground when handling server components.

Electronic devices can be easily damaged by static electricity. To prevent damage, keep them in their protective packaging when they are not installed in your server.

Required Tools

Prepare a Phillips screwdriver to install the server in the rack.

Converting your Tower Server to a Rack-Mount Server

Removing the Front Door and Hinge Plat

1. Press the plastic clip in towards the chassis.
2. Pull the hinge pin out with one hand while supporting the door with the other.
3. Slide the door to remove it from the other hinge pin.
4. Remove the hinge pins and save them for future use.

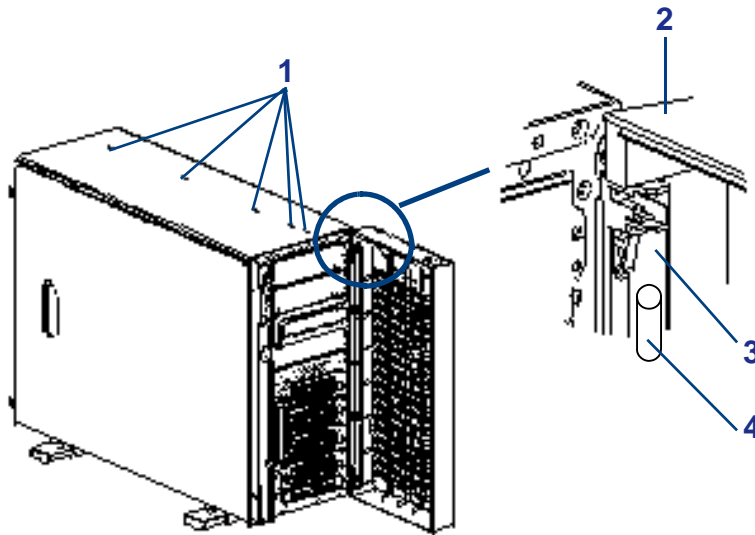


Figure 9: Removing the Front Door and Hinge Plate

- 1: Nylon rivets
- 2: Front door
- 3: Door hinge
- 4: Hinge pin

5. Remove the four screws attaching the hinge plate to the chassis and save them for future use.
6. Remove the hinge plate.
7. Save the hinge plate for future use.
8. Remove the five nylon rivets from the top cover.

Removing the Stabilizers

1. Place the server on its right side (as viewed from the front) on a covered surface to avoid scratches to the side panel.
2. Remove the eight screws that attach the four stabilizers to the bottom of the chassis.
3. Remove the stabilizers and save them for future use.

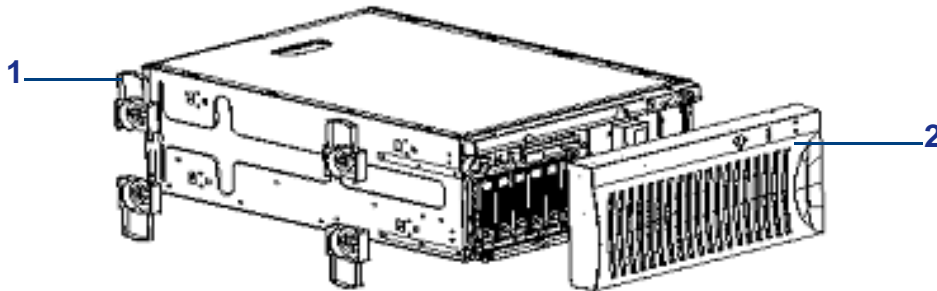


Figure 10: Removing the Stabilizers

- 1: Stabilizers
- 2: Front door

Installing the Device and HDD Covers

1. Attach the device covers to the EMI shields protecting the empty 5.25-inch device bays of the server using the screws securing the EMI shields to the server chassis.

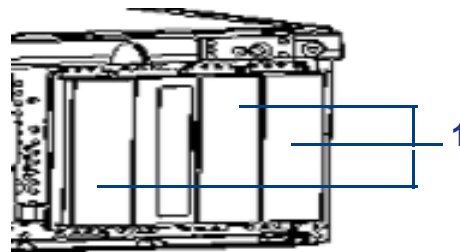


Figure 11: Removing the Device Covers

- 1: Device cover

2. Attach the appropriate HDD cover to the inside of the front bezel using screws (D).
 - If your model is equipped with fixed hard disk drives (4 slots), secure the HDD cover (1) to the front bezel (3) using four screws.

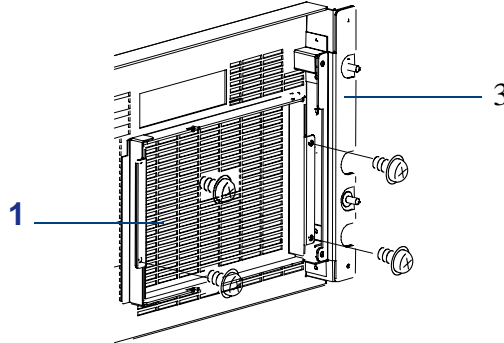


Figure 12: Installing the HDD Cover (1)

- If your model is equipped with hot-swap hard disk drives (4 slots), secure the HDD cover (2) to the front bezel (3) using two screws.

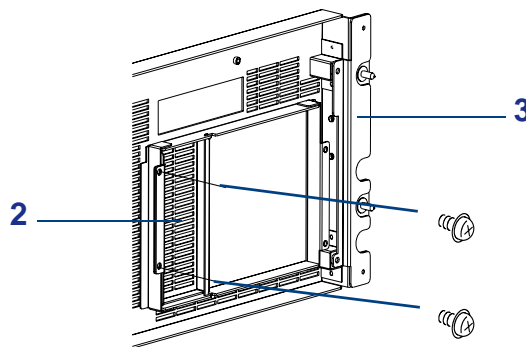



Figure 13: Installing the HDD Cover (2)

 **Note:** Do not install a HDD cover onto the front bezel if your server is equipped with 6 hot-swap SCSI hard disk drive bays.

Installing the Stabilizer Covers

Attach the four stabilizer covers (1) to the bottom of the server using four screws (C).

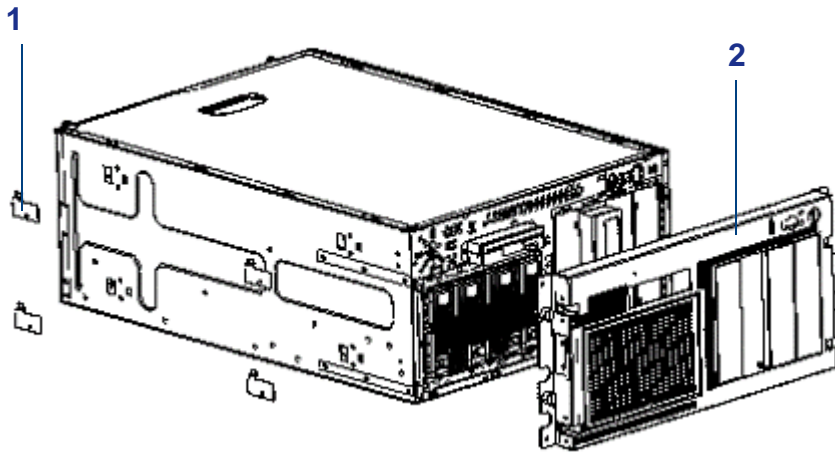


Figure 14: Installing the Stabilizer Covers and the Front Bezel

- 1: Stabilizer cover
- 2: Front bezel


Installing the Front Bezel

Attach the front bezel (2) to the front of the server using four screws (C). See Figure 2-7.

Installing the Server in a Rack

The following subsection describes how to assemble your rack-mount server into a standard EIA 19-inch rack cabinet.

Before you begin select an appropriate location in your rack cabinet for the rack-mount server. To improve rack stability, mount heavier items towards the bottom of the rack cabinet. If the rack is a stand-alone unit and the rack is more than 75 % filled with components, consider installing an optional stabilizer kit.

 *Note: When planning your server configuration for the rack cabinet you should consider the length of the cables that interconnect system components.*

Warning

- **ANCHOR THE EQUIPMENT RACK:** The equipment rack must be anchored to an unmovable support to prevent it from falling over when one or more servers are extended in front of it on slide assemblies. The anchors must be able to withstand a force of up to 113 kg (250 lbs). You must also consider the weight of any other device installed in the rack.
 - **MAIN AC POWER DISCONNECT:** You are responsible for installing an AC power disconnect for the entire rack unit. This main disconnect must be readily accessible, and it must be labeled as controlling power to the entire unit, not just to the server(s).
 - **GROUNDING THE RACK INSTALLATION:** To avoid the potential for an electrical shock hazard, you must include a third wire safety grounding conductor with the rack installation. If a server power cord is plugged into an AC outlet that is part of the rack, then you must provide proper grounding for the rack itself. If server power cords are plugged into wall AC outlets, the safety grounding conductor in each power cord provides proper grounding only for the server. You must provide additional, proper grounding for the rack and other devices installed in it.
-

Preparing the Slide Rail Assemblies

1. Locate the two rack mounting rail assemblies. Each rail assembly consists of a stationary rail attached to the server and a removable sliding rail. The slide rail assembly ships as an assembled unit.

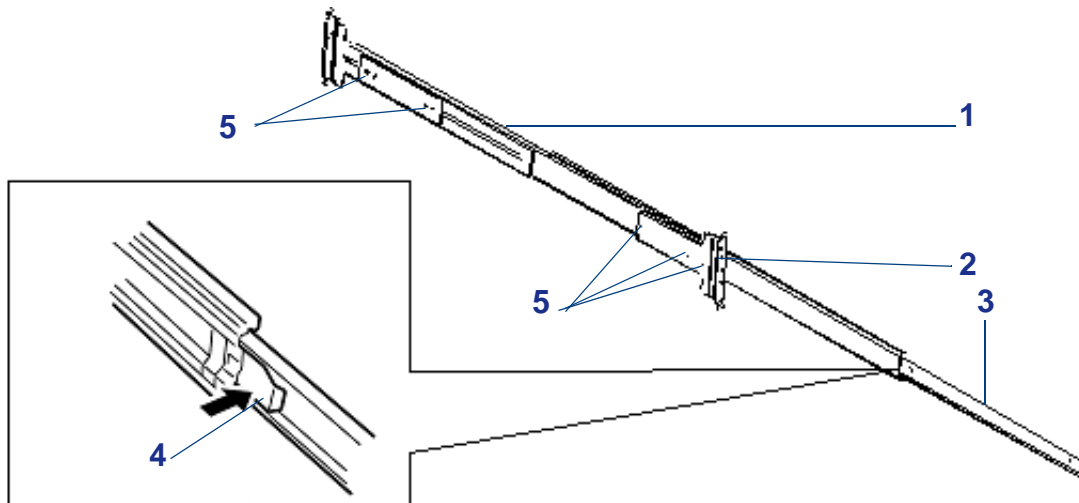


Figure 15: Slide Rail Assembly

- 1: Slide rail assembly
- 2: Outer rail
- 3: Inner rail
- 4: Release lever
- 5: Screws

Caution

If the slide rail assemblies are to be mounted on an old rack model equipped with non-"L" shaped vertical mounting rails, the screws (5) securing the front and rear mounting brackets must be replaced by screws E to ease slide rail installation. If your rack cabinet was purchased after 2001, it is equipped with "L" shaped vertical mounting rails offering the least possible interference to server rails. In this case, the screws (5) do not need to be replaced.

2. To remove the inner rail from each slide rail assembly:
 - Position the slide rail assembly on a flat surface with the inner rail facing up.
 - Fully extend the three telescoping slide bars until they lock in place (see previous figure).
 - While pressing up on the inner rail release lever, slide the inner rail out of the assembly and set it aside for installation on the server.

3. Attach the inner rails to both sides of the server using eight screws (A).

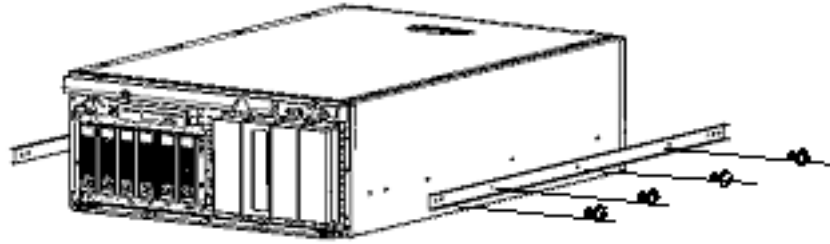


Figure 16: Attaching Inner Rails to the Server

4. With each slide rail assembly on a flat surface, extend the outer rail and loosen the three screws securing the rear mounting bracket.

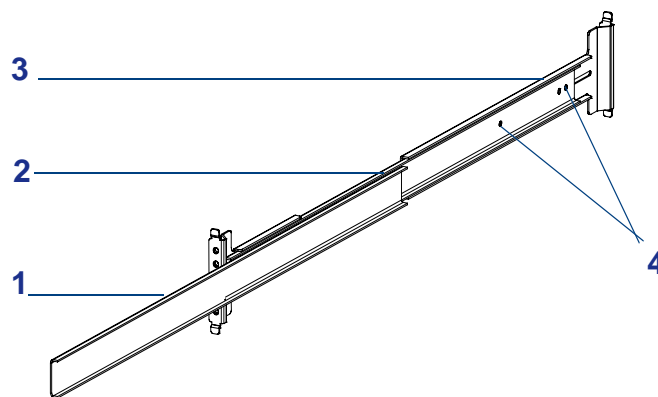



Figure 17: Loosening the Rear Mounting Bracket Screws

- 1: Outer rail
- 2: Slide rail assembly
- 3: Rear mounting bracket
- 4: Screws

Defining the Location of the Server in the Rack

The template supplied with your rack mount kit defines the location of the mounting screws in the rack cabinet where the server is to be installed. The template can be placed on the front and rear of the rack cabinet to show the mounting screw hole positions of the server guide rail assemblies, front bezel, and cable retention arm bracket.

 **Note:** Ensure that the template is aligned properly so that the mounting screw hole cut outs are at the same height on each side of the cabinet and level with each other. The front of the template defines the front rail mounting screw holes and front bezel screw holes of the server in the rack cabinet. The back of the template defines the rear rail mounting screw holes of the server in the rack cabinet and the screw holes for the cable arm bracket.

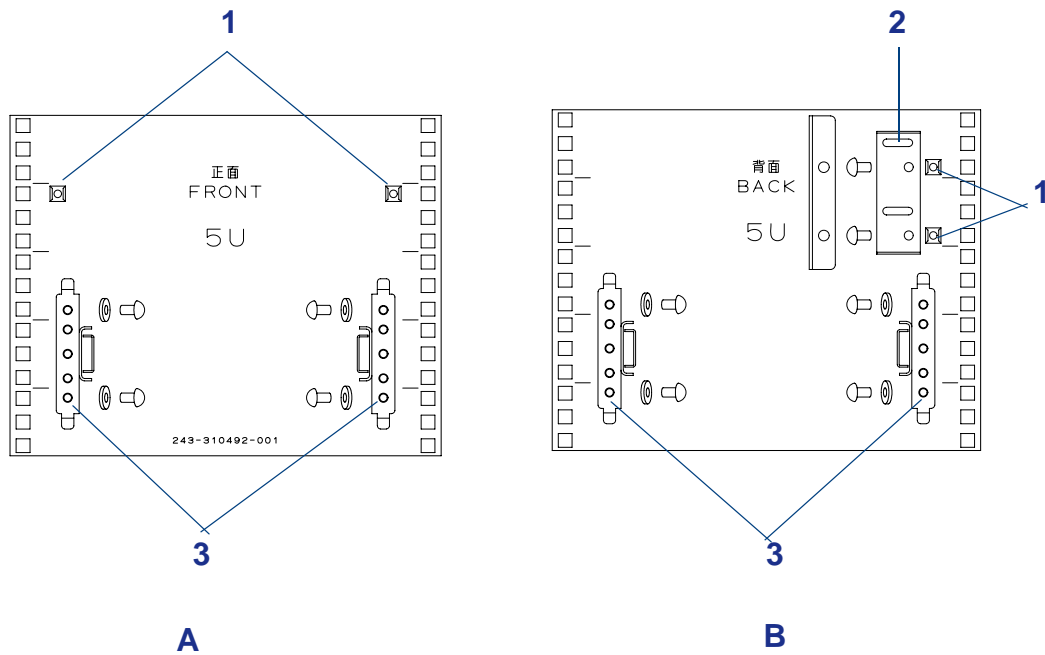


Figure 18: Template

A: Front side


B: Rear side

1: Caged nut positions

2: Cable arm position

3: Slide rail positions

1. Determine where you want to install the server in the rack cabinet:
 - To improve rack stability, mount the server towards the bottom of the rack cabinet.
 - If there are units already installed, install the server into the next empty space from the bottom of the rack cabinet.
2. Use the template supplied with your rack mount kit to mark the front and rear mounting screw hole locations (with a pencil) where you want the server to be mounted for the slide rail assemblies, front bezel thumbscrew holes, and cable retention arm bracket. See the previous Figure 2-11.

 *Note: For vertical reference, every three screw holes on the rack vertical mounting rail are equal to 1U (1.75 inches). Mounting holes in the vertical rails of equipment racks are commonly spaced in a 5/8 x 5/8 x 1/2-inch sequence. Perform the following steps carefully; brackets must be mounted with precision to allow room for the next server you install in the rack.*

3. To insert caged nuts in their marked locations on the front and rear vertical mounting:
 - Position the caged nut on the inside of the vertical mounting rail.
 - Hook the side lip of the caged nut into the square hole in the rail.
 - Push the other side lip of the caged nut into the square hole in the rail until it is secured.
 - Repeat for each caged nut.

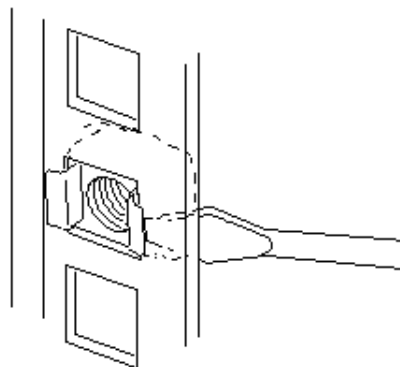


Figure 19: Inserting the Caged Nuts

Installing the Rail Assemblies to the Rack Cabinet

1. Measure the distance between the front and rear vertical mounting rails of your rack. You'll use this measurement for a preliminary adjustment of the slide rails in the next step.
2. Adjust each slide rail to the approximate length measurement determined in Step 1. Loosely tighten the rear mounting bracket adjustment screws shown in Figure 2-10. Final adjustment will be made once the slide rails are installed into the system rack.
3. Align one of the slide rail assemblies behind the mounting holes in the vertical mounting rail (see Figure 2-13) located on the front left side of the rack cabinet. The tabs on the front and rear of the slide rail assembly help to align it with the holes in the vertical mounting rail.
4. Install two screws and two washers to secure the front of the slide rail assembly to the front vertical mounting rail and tighten loosely.

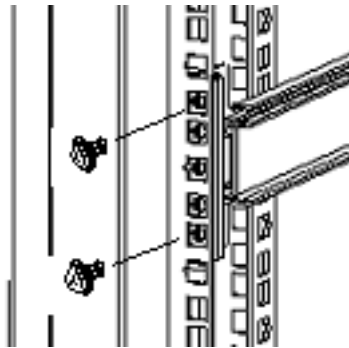


Figure 20: Installing the Slide Rail Assembly (Front Side)

5. Carefully align the rear holes of the slide rail assembly with the holes in the rear vertical mounting rail.
6. Install two screws (B) and two washers to secure the rear of the slide rail assembly to the vertical mounting rail.

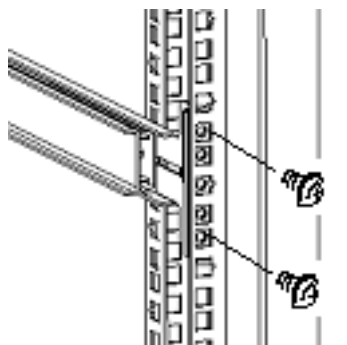


Figure 21: Installing the Slide Rail Assembly (Rear Side)

7. Tighten all four screws holding the slide rail assembly to the vertical mounting rails.
8. Tighten the three screws securing the rear mounting bracket (see Figure 2-10).
9. Repeat steps 3 through 8 for mounting the other slide rail assembly on the right side of the rack cabinet.

Installing the Server in the Rack

Warning

The non-hot-swap system can weigh up to 35 kg. If the system contains numerous optional boards and peripheral devices, it will weigh more. To avoid personal injury, make sure you have at least three persons help you lift or move the system.

1. Extend the slide rails until they are locked in place.
2. With three or more persons assisting you, lift the server and align the inner rails attached to both sides of the server with the extended rails.
3. Insert the inner rails into the extended slide rails and push the server into the rack until it stops.
4. Carefully press down the release levers on the inner rails to release the locks and slide the server all the way into the rack.
5. To check that the server slides in and out of the rack, grasp the two handles on the front of the server and slowly pull the server out and push it back in.

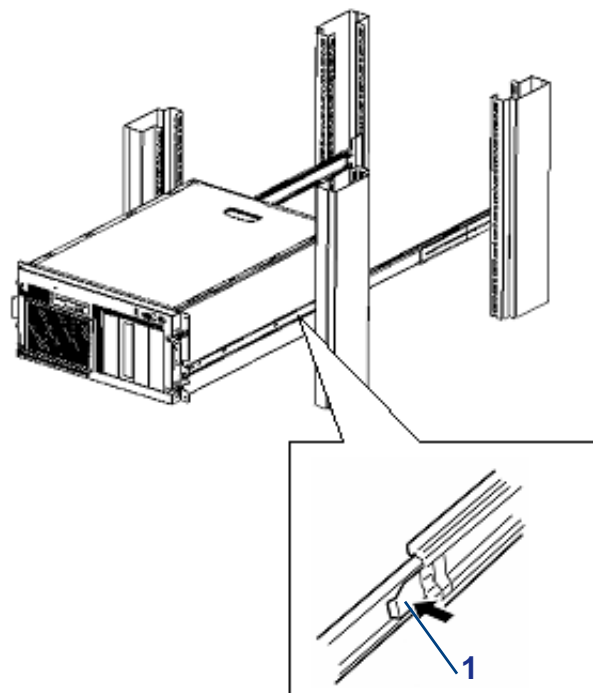


Figure 22: Installing the Server in the Rack Cabinet

1: Release lever

Cable Arm Assembly

The quadruple hinged cable retention arm attaches to the rear of the server and the system rack allowing cables to move as the server slides back and forth within the rack cabinet. The server cables are tie-wrapped to the cable retention arm. The following sections provide procedures for installing the cable retention arm assembly to your server and your system rack.

Installing the Cable Arm Assembly

1. Using two screws (D), mount the arm bracket onto the rear of the server:

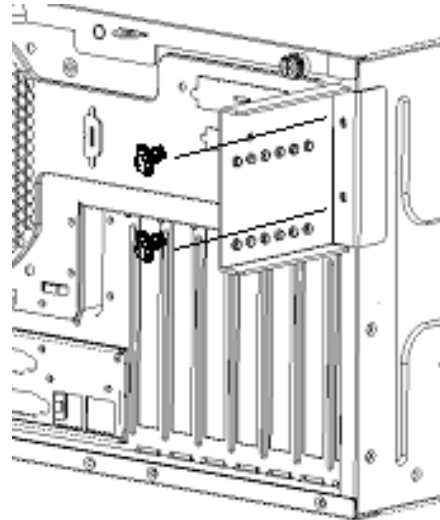


Figure 23: Installing the Arm Bracket

2. To attach the cable arm to the rack frame:
 - When the distance between the front vertical mounting rail and the rear vertical mounting rail is about 743 mm, align one end of the cable arm with the outside of the caged nuts installed to the rear of the rack frame and secure it with two screws (B).

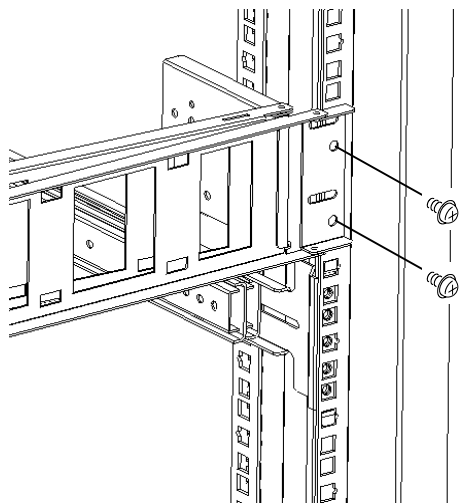


Figure 24: Attaching the Cable Arm to the Rack Frame

- When the distance between the front vertical mounting rail and the rear vertical mounting rail is from 700 mm to 742 mm, attach the cable arm (1) to the adapter bracket (2) to shorten the distance (3) as much as possible:

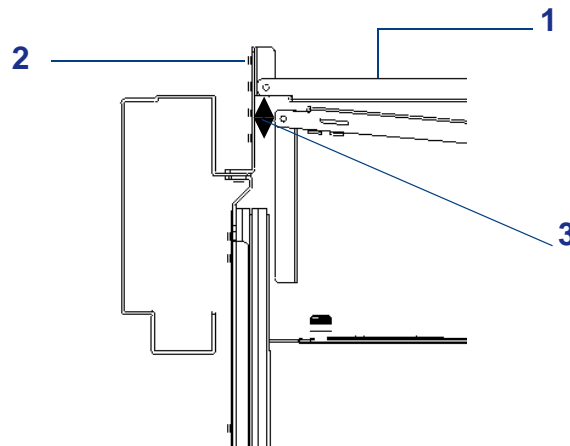


Figure 25: Installing the Adapter Bracket (1)

- When the distance between the front vertical mounting rail and the rear vertical mounting rail is from 745 mm to 900 mm, attach the cable arm (1) to the adapter bracket (2) to shorten the distance (3) as much as possible:

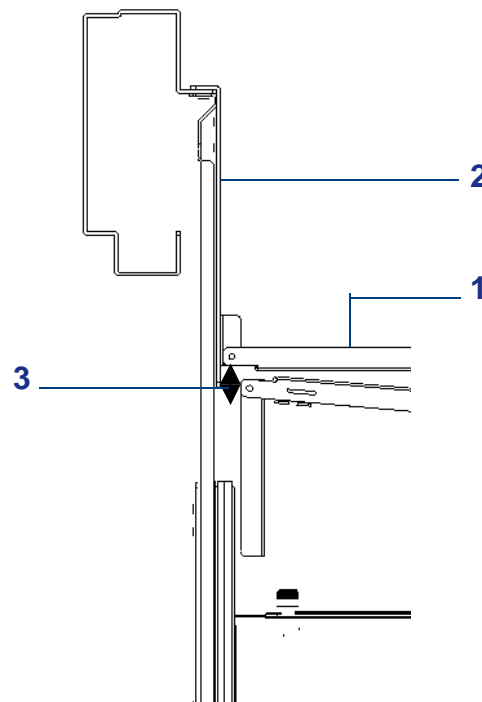


Figure 26: Installing the Adapter Bracket (2)

3. Align the small holes on the cable arm with those on the arm bracket installed in Step 1, then attach the cable arm to the arm bracket using two screws (D).

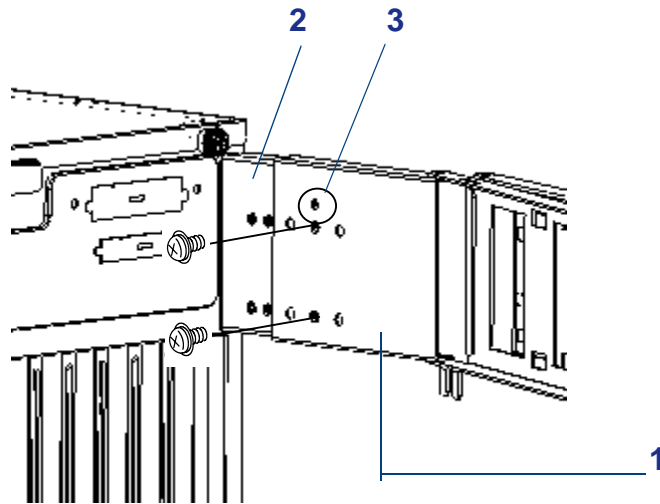


Figure 27: Attaching the Cable Arm to the Arm Bracket

- 1: Cable arm
- 2: Arm bracket
- 3: Small hole

4. Press in on the rail release latches and slowly push the server in and out of the rack several times.
5. Ensure proper movement of the cable arm.
Note that this cable arm can be moved toward the rear of the rack cabinet to allow cable connection and replacement of the power supply unit.
Check that no excess force is applied to the cable arm by pulling it toward you. Adjustment of the cable arm hinged brackets may be necessary to attain smooth operation. Tighten all screws. Ensure the server can be fully closed and secured to the rack.

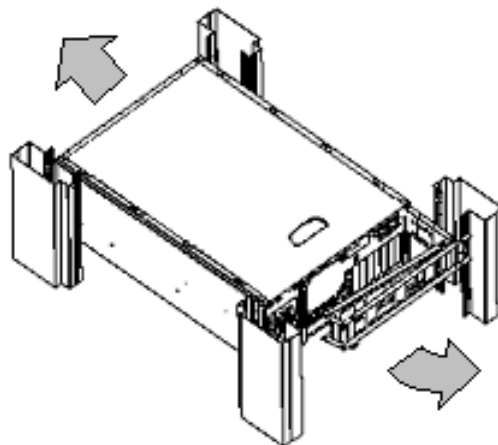


Figure 28: Adjusting the Cable Arm Assembly

Installing Cables

1. Plug all external cables into the server.
2. Plug all power cords into the power outlet.
3. Bundle all the server cables together and tie-wrap them to the cable arm.
4. Check that no excess force is applied to the cables by pulling the server out of the rack and pushing it back into the rack.

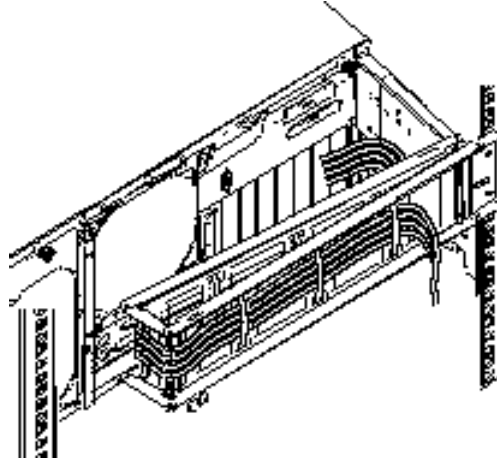


Figure 29: Bundling and Tie-wrapping Server Cables

Caution

Server cables must be bundled and tie-wrapped to prevent them from coming into contact with the slide rails and other equipment installed in the rack cabinet.

Form the cables with a slight slack between the cable arm and the server. This is to prevent the cables from coming off when the server is pulled out from the rack and to avoid applying any pressure to the plug of the power cord.

Installing the Cable Arm Stopper

Using a screw (D), mount the cable arm stopper onto the cable arm.

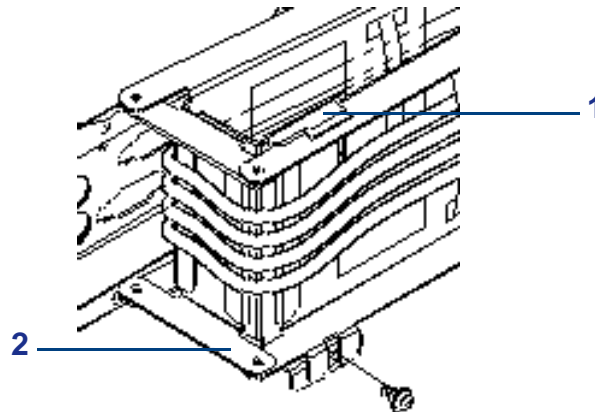


Figure 30: Installing the Cable Arm Stopper

- 1: Cable arm stopper
- 2: Cable arm

Securing the Server in the Rack

Push the server all the way into the rack and tighten the four captive thumbscrews to secure it to the rack.

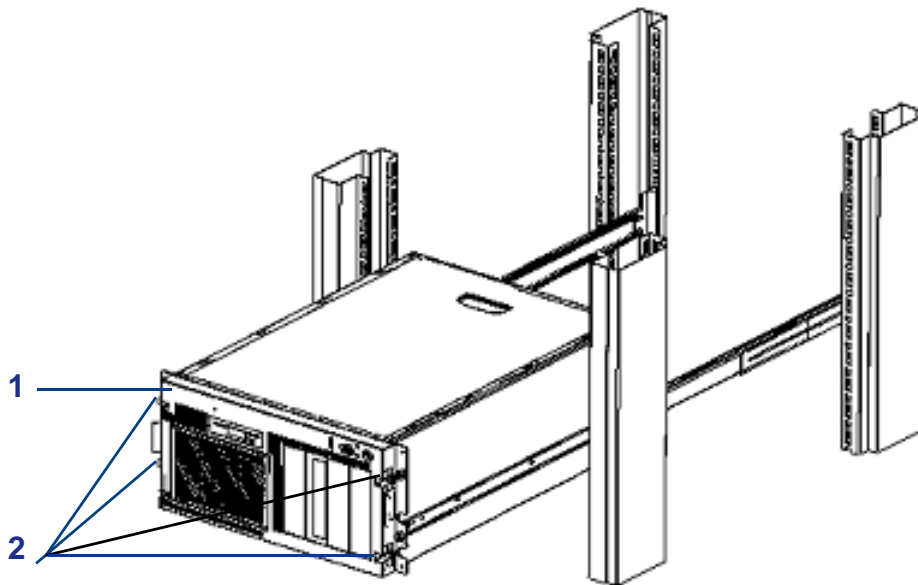


Figure 31: Securing the Server

- 1: Front bezel
- 2: Captive thumbscrews

Removing the Server from the Rack

1. Loosen the four captive thumbscrews on the front of the server (See [Figure 31: Securing the Server](#)).
2. Grasp the two handles on the front of the server and slowly pull it out until the sliding rails lock in place.

Making Connections

Connect your keyboard, monitor, and mouse. Also connect any external peripheral devices such as a printer or scanner by following the instructions included with these devices.

Caution

- Power off the server and a peripheral device before connection. Connecting a powered peripheral device to the powered server will cause malfunctions and failures.
 - Inserting a telephone line connector into a LAN RJ-45 port may result in personal injury and equipment damage
 - To connect a third-party peripheral device or interface cable to the server, consult with your sales agent for availability of such a device or cable. Some third-party devices may not be used for the server.
 - To connect the provided keyboard and mouse, plug their connectors to the server with the "Δ" mark on the connectors facing right.
-

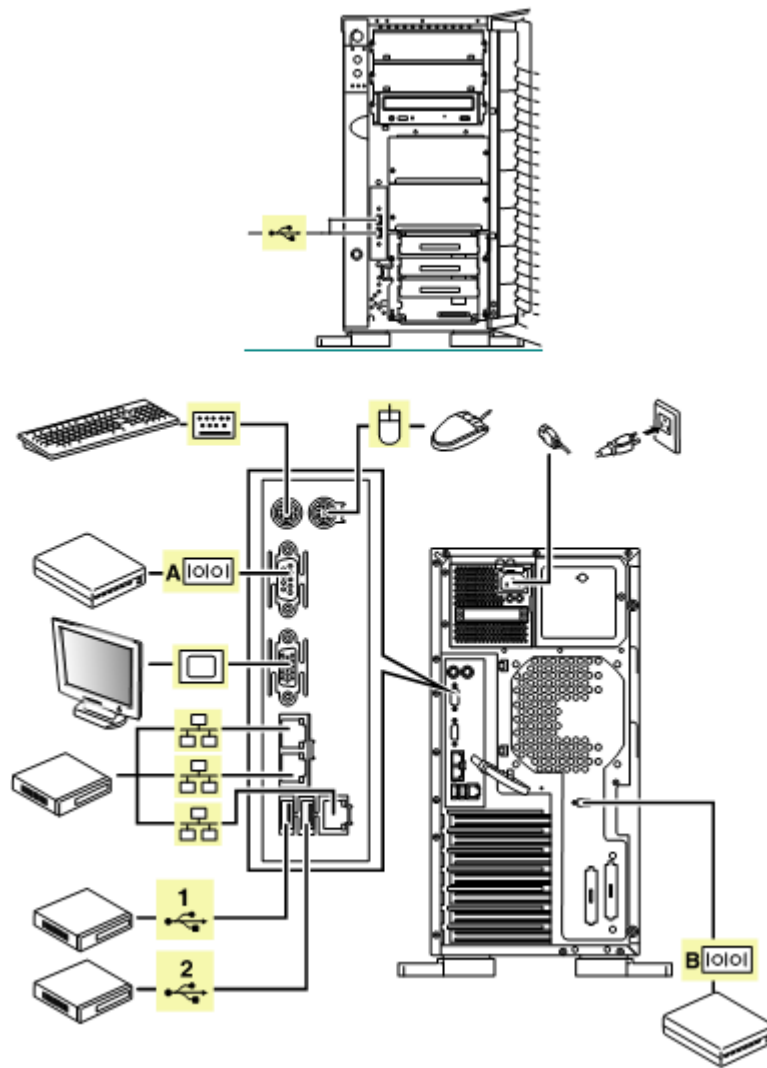


Figure 32: Connecting Peripheral Devices

Connecting the Power Cord

Plug the female end of the AC power cord into the input receptacle on the rear of the power supply cage. Plug the male end of the power cord into NEMA 5-15R outlet for 100-120 VAC, or CEE7, or UK outlet for 200-240 VAC.

If the power cord(s) supplied with the system is not compatible with the AC wall outlet in your region, obtain a suitable power cord that meets the following criteria:

- The power cord must be rated for the available AC voltage and have a current rating that is at least 125 % of the current rating of the system.
- The power cord connector that plugs into the wall outlet must be terminated in a grounding-type male plug designed for use in your region. It must have certification marks showing certification by an agency acceptable in your region.
- The power cord connector that plugs into the system must be an IEC- type CEE-22 female connector.
- The power cord must be less than 1.8 meters (6.0 feet) long.

Warning

- Your system shipped with a power cord for the power supply. Do not attempt to modify or use the supplied AC power cord if it is not the exact type required.
 - When connecting the power cord to a power control unit such as an UPS unit, check that the power control unit is powered OFF. Connecting the power cord while power is supplied to the power control unit may cause a failure.
 - Do not plug the power cord in to an improper power source.
 - Do not connect the power cord to an outlet that has an illegal number of connections.
 - Insert the power plug into the outlet as far as it goes.
-

To connect the power cord:

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

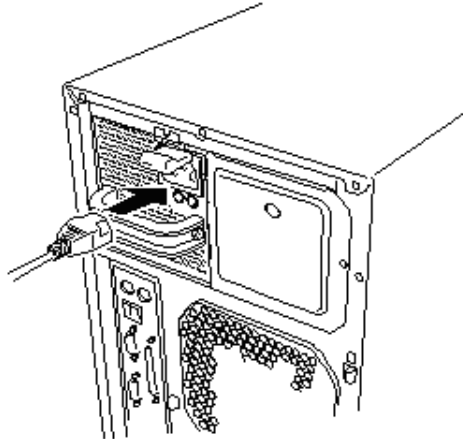


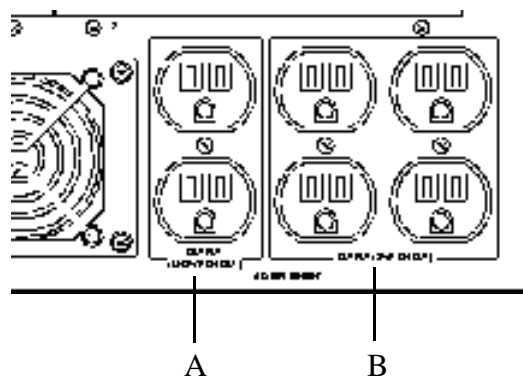
Figure 33: Connecting the Power Cord

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

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

To control power supply with an application that controls the UPS, connect the power cord to an SWITCH OUT outlet.

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



A UN-SWITCH OUT/Output 2 B SWITCH OUT/Output 1

Figure 34: Uninterruptible Power Supply Outlets

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

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

Change a parameter for "AC Link" under the Server menu of the BIOS setup utility.

Using the System

The following subsections describe how to use this server system properly and safely, including an explanation of the server system power on/off sequences, what the POST program checks in the server, and how to perform a forced power shutdown.

When using the server system the following precautions should be observed.

- Make sure you power off the server before connecting or disconnecting cables between the server and peripheral devices. Connecting or disconnecting the cables while the server is powered on may cause malfunction or failures within the server.
- Verify that the access lamp on the diskette drive is unlit before turning off the server or ejecting the floppy disk. Turning off the server or ejecting the floppy disk while the access lamp is lit may damage data being stored on the floppy disk.
- After turning off the server, wait at least 10 seconds before turning it on again. Cycling the power immediately may cause malfunction or failures of the server.
- Before relocating the server, turn off the power and unplug the power cord from the outlet. Moving the server when it is powered may cause malfunction or failures of the server.
- Clean the server regularly. Regular cleaning prevents failures of the server and its components.
- Lightning may cause a momentary voltage drop. To prevent this problem, an uninterruptible power supply unit is recommended.
- Only use options qualified for the server. A non-qualified option may be mounted or connected to the server, but it may fail to operate normally or even cause failures. These types of failures are not covered under warranty.

Removing the Front Door

Open the front door to power on/off the server, to access the floppy disk drive, optical disc drive, and 5.25-inch devices, and to install/remove hard disks to the 3.5-inch device bays.

To remove the front door:

1. Insert the provided security key into the key hole and turn the key to unlock the front door (See the following figure).
2. Hold the front door edges and gently pull the door away from the server chassis.

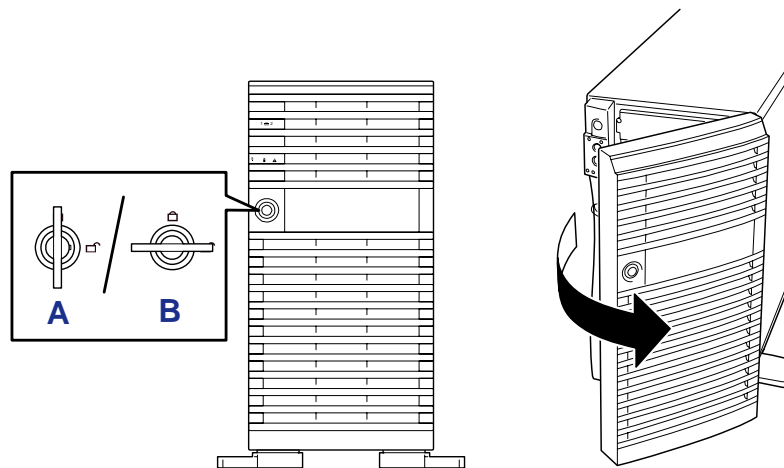



Figure 35: Opening the Front Door

A: Lock
B: Unlock

Caution

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

 *Note: The standard optical disc drive and some options for the 5 1/4-inch devices such as an optical disc drive have a function to eject a tray or media using a software command. Before issuing a software command to eject a tray or media, confirm that the front door is open. If the command is executed while the front door is closed a tray or media may run into the front door resulting in an error or may cause the unit to fail.*

Installing the Front Door

When you close the front door, lock the door with the key for security.

Optical Disc Drive

Your server is provided with the optical disc drive on its front to read data from an optical disc drive.

Setting and Removing the Disc

1. Make sure that the server is powered (the POWER/SLEEP lamp is lit) before inserting an optical disc into the optical disc drive.
2. Press the Open/Close button on the front of the optical disc drive to eject the tray. The tray comes out.
3. With the optical disc label facing up, place an optical disc in the tray gently and securely.

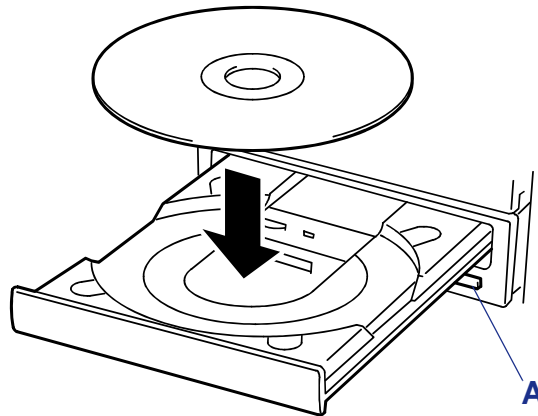


Figure 36: Inserting the Disc

A: Open/Close button

4. Press the Open/Close button or gently push on the tray front. The tray is automatically retracted into the optical disc drive.

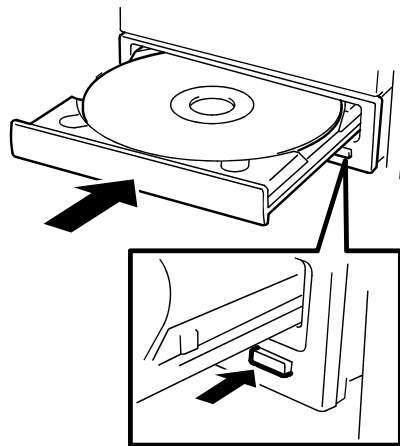


Figure 37: Pushing the Tray

Caution

If the optical disc drive produces an abnormal noise after inserting the optical disc, remove the disc, and insert it again.

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

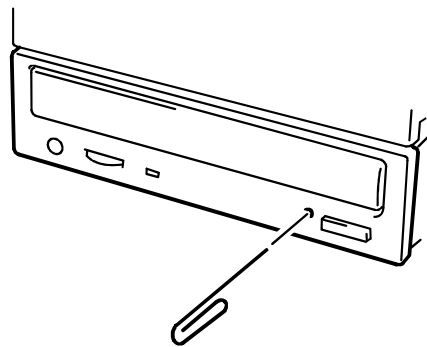
Your OS may have a command to eject the tray.

When you have taken out the disc, retract the tray back in place.

When you fail to eject

When you fail to eject the DVD-ROM tray with the Open/Close button and take out the DVD-ROM from the server:

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




Caution

- Do not use a toothpick or plastic stick that is easy to break.
 - If the above procedure does not let you take out the DVD-ROM, contact your sales agent.
-

3. Hold the tray and pull it out.
4. Take out the optical disc.
5. Push the tray back into position.

Powering On Your System

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

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

3. Open the front door (tower-based system only) and press the push-button power on/off switch (1) on the front panel. The server power lamp (2) lights.

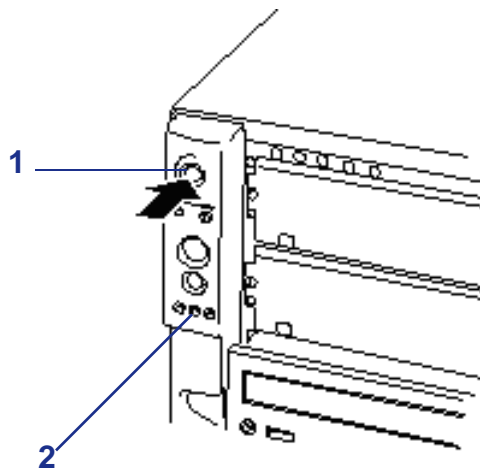


Figure 38: Power Switch and Power Lamp


- 1: Power switch
2: Power lamp

4. If the server power lamp is not lit, ensure the AC power cord is connected to a functional AC power source.

After a few seconds your system begins the internal Power-On Self Tests (POST). POST checks the motherboard, CPU(s), memory, keyboard, mouse, and most installed peripheral devices. POST also displays the start messages of the BIOS setup utility during execution.

The POST check results should be checked in the following cases:

- When the server is being used for the first time.
- When the server appears to fail.
- When the server beeps many times between power-on and OS start-up.
- When an error message appears on the screen.

 *Note: For error messages that appear on the display unit, see [“Error Messages” on page 209](#).*

Caution

Always allow POST to complete before powering down your server.

If you have problems powering on your server, refer to [“*Problem Solving*” on page 188](#)”.

After you have powered on your server, insert the ExpressBuilder CD-ROM into the optical disc drive, reboot the system and follow the screen prompts to run ExpressBuilder.

After you have successfully powered on your system, refer to [“*Appendix 4: Installing the Operating System with Express Setup*” on page 235](#).


Caution

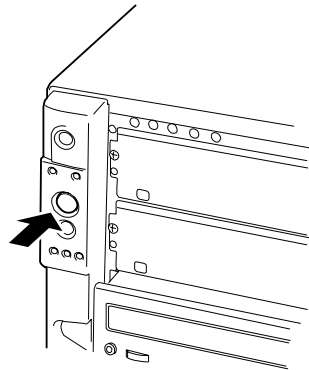
- If the power cord is connected to the server, an initial diagnosis of the hardware starts. The POWER switch does not work while in diagnosis. Wait for about 10 seconds, then press the POWER switch.
 - Always allow POST to complete before powering down your server (see the next subsection for POST).
-

Power Saving Mode

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


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

 *Note: Some PCI boards do not support this feature.*



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

To resume the original state, press the POWER 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 for Windows Server 2003.)*

Caution


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

Powering Off Your System

When server system power is on, pressing the power on/off switch on the front panel of the server turns the power off.

To power off your system:

1. Shutdown the operating system (OS).
2. Press the power on/off switch on the front panel of the server.
The power lamp goes out.
3. Power off the peripheral devices.

 *Note: If the server power cord is connected to a power control unit such as an UPS (Uninterruptible Power Supply), refer to the UPS user's guide for proper power-off procedures.*

Forcing a Power Shutdown

A forced power shutdown can be used when the power on/off switch does not power off the server or the reset functions do not work.

To force a power shutdown, press in on the power on/off switch located on the front panel of the server for at least 4 seconds.

To power on after a forced shutdown, wait 10 seconds and then power on again.

Configuring Your System

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

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

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

Use the ExpressBuilder CD-ROM to create device driver floppy disks.

BIOS Setup Utility

The SETUP utility is provided to make basic hardware configuration for the server. This utility is pre-installed in the flash memory and does not require a diskette or an operating system present to run.

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

Caution

- The SETUP utility is intended for system administrator use only.
 - The SETUP utility allows you to set a password. The server is provided with two levels of password: Supervisor and User. With the Supervisor password, you can view and change all system parameters of the SETUP utility. With the User password, system parameters available for viewing and changing are limited.
 - Do not set any password before installing the OS.
 - The server contains the latest version of the SETUP utility. Dialog boxes appear on your SETUP utility, thus, may differ from descriptions in this manual. If you find anything unclear, see the online help or ask your service representative.
-

Starting SETUP Utility

Powering on the server starts the POST (Power On Self-Test) and displays its check results. If a full-screen logo is displayed, press **Esc**.

After a few seconds, the following message appears at bottom left on the screen: "Press F2 to enter SETUP".

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

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

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.

Table 2: Main Menu

Menu	Use
Main	Use this menu for basic system configuration.
Advanced	Use this menu for setting the Advanced Features available on your system.
Security	Use this menu to set User and Supervisor Passwords and configure the secure mode.
Server	Use this menu for configuring unique Server features.
Boot	Use this menu to configure Boot Device priority.
Exit	Exits the current menu.

Use the arrow keys to select a menu or an item on a displayed menu. Press the value keys (listed in the table below) to cycle through the allowable values for the selected field. Use the Exit menu's "Save Values" selection to save the current values on all the menus.

To display a submenu, position the cursor on a selection that has a submenu and press **ENTER**. An arrow precedes selections with submenus.

Refer to the following table for information on the keys that you use with BIOS Setup. These keys are also listed at the bottom of the Setup menu.

Table 3: BIOS Setup Keys

Key	Function in Setup Menu
ESC	Exit the current menu and return to the previous menu.
Left or right arrow keys	Move between menus.
Up or down arrow keys	Move cursor up and down. The cursor moves only to the settings that you can change.
F9	Load default configuration values for this menu.
F10	Save configuration values and exit.
ENTER	Execute command or Select † submenu.

BIOS Setup Configuration Settings

The BIOS Setup Configuration tables show the default settings for the BIOS Setup Utility and provide a place for you to record any changes you make to these settings. Recommended values are bold in the following tables.

Main Menu

Table 4: Main Menu

Feature	Choices or Display Only	Description	Your Setting
System Time	HH:MM:SS	Set the System Time.	
System Date	MM/DD/YYYY	Set the System Date.	
Hard Disk Pre-Delay	Disabled 3, 6, 9, 12, 15, 21, 30 Seconds	Allows slower spin-up drives to come ready.	
Primary IDE Master	Selects sub-menu		
Primary IDE Slave	Selects sub-menu		
Secondary IDE Master	Selects sub-menu		
Secondary IDE Slave	Selects sub-menu		
Processor Settings	Selects sub-menu		
Language	English (US) Italiano Español Français Deutsch	Select the display language for the BIOS.	

Warning

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

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

Check the system clock at the rough rate of once per month. When your system requires high time precision, we recommend using a time server (NTP server).

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

Primary and Secondary Master & Slave IDE & Serial ATA Channel 0 & 1 submenus

Correspondence between the menu items and devices:

- Primary IDE Master: ATA hard disk drive 1 (not supported)
- Primary IDE Slave: ATA hard disk drive 2 (not supported)
- Secondary IDE Master: Optical disc drive (standard)
- Secondary IDE Slave: None

- Serial ATA Channel 0 Master: Serial ATA hard disk drive 1 (option)
- Serial ATA Channel 1 Master: Serial ATA hard disk drive 2 (option)

Table 5: Primary and Secondary Master and Slave IDE Submenus


Feature	Choices or Display Only	Description	Your Setting
Type	None User Auto DVD-ROM	Selects the type of device attached to the IDE or serial ATA channel. It is strongly recommended to keep the factory setting [Auto].	
The following options do not appear when <i>None</i> or <i>Auto</i> are selected for Type.			
Multi-Sector Transfer	Disabled 2 Sectors 4 Sectors 8 Sectors 16 Sectors	Specifies the number of sectors that are transferred per block during multiple sector transfers.	
LBA Mode Control	Enabled Disabled	LBA stands for "logical block addressing". Enable/disable LBA instead of cylinder, head, sector, addressing.	
Transfer Mode	Standard Fast PIO 1 Fast PIO 2 Fast PIO 3 Fast PIO 4 FPIO 3/DMA1 FPIO 4/DMA2	Select the method for moving data to/from the drive.	
Ultra DMA	Disabled Mode 0 Mode 1 Mode 2 Mode 3 Mode 4 Mode 5	Select the Ultra DMA mode used for moving data to/from the drive.	

*Processor Settings Submenu***Table 6: Processor Settings Submenu**

Feature	Choices or Display Only	Description	Your Setting
Processor Retest	Yes No	If Yes is selected, the BIOS will clear historical processor status and retest all the processors on next boot. This parameter is automatically reset to "No" at the next boot.	
Processor Speed Setting	Display only	Displays the processor speed detected by the BIOS	

Table 6: Processor Settings Submenu (Continued)

Feature	Choices or Display Only	Description	Your Setting
Processor 1 CPUID	Display only	Displays the processor CPU ID detected by the BIOS. "Disabled" indicates that the processor is defective. "Not installed" indicates that processor 1 is not installed.	
Processor 1 L2 Cache	Display only	Displays the processor level 2 cache detected by the BIOS	
Processor 2 CPUID	Display only	Displays the processor CPU ID detected by the BIOS. "Disabled" indicates that the processor is defective. "Not installed" indicates that processor 2 is not installed.	
Processor 2 L2 Cache	Display only	Displays the processor level 2 cache detected by the BIOS	
Execute Disabled Bit	Disabled Enabled	Displays the CPU which supports Execute Disabled Bit	
Intel(R) Virtualization Tech	Enabled Disabled	Enables or disables the Intel(R) Virtualization Technology.	
Enhanced Intel SpeedStep(R) Tech.	Disabled Enabled	Enables or disables the Enhanced Intel SpeedStep(R) Technology.	

 *Note: The BIOS may display more options than presented here.*

Advanced Menu

Table 7: Advanced Menu

Feature	Choices or Display Only	Description	Your Setting
Memory Configuration	Select submenu		
PCI Configuration	Select submenu		
Peripheral Configuration	Select submenu		
Advanced Chipset Control	Select submenu		
Boot-time Diagnostic Screen	Enabled Disabled	If disabled, the BIOS will display a full-screen logo during POST. Press Esc to switch to the POST execution screen.	
Reset Configuration Data	No Yes	Select Yes if you want to clear the system configuration data stored in POST. This parameter is automatically reset to No at the next boot.	
NumLock	Auto Off On	Sets power on NumLock state.	
Memory/Processor Error	Boot Halt	When <i>Boot</i> is selected, the system will attempt to boot after a memory or processor error. If <i>Halt</i> is selected, the boot is stopped when POST error occurs.	

Memory Configuration Submenu

Table 8: Memory Configuration Submenu

Feature	Choices or Display Only	Description	Your Setting
System Memory	Display only	Indicates the total capacity of the basic memory	
Extended Memory	Display only	Indicates the total capacity of the extended memory.	

Table 8: Memory Configuration Submenu (Continued)

Feature	Choices or Display Only	Description	Your Setting
DIMM Group #1-6 Status	Normal Not installed Disabled	<p>Indicates the current memory status. (View only)</p> <p>Normal indicates that the memory devices operate normally.</p> <p>Disabled indicates that one or more memory devices are defective.</p> <p>Not Installed indicates that no memory devices are installed.</p> <p>On-screen group numbers and DIMM sockets on motherboard are associated as follows.</p> <p>Group #1: DIMM #1-1, #2-1</p> <p>Group #2: DIMM #3-1, #4-1</p> <p>Group #3: DIMM #1-2, #2-2</p> <p>Group #4: DIMM #3-2, #4-2</p> <p>Group #5: DIMM #1-3, #2-3</p> <p>Group #6: DIMM #3-3, #4-3</p> <p>Each group is composed of two DIMMs of interleave type.</p>	
Memory Retest	No Yes	<p>If you select Yes, the BIOS will clear the historical memory status and retest all the DIMMs on the next boot.</p> <p>This parameter is automatically reset to No at the next boot.</p>	
Extended RAM Step	1MB 1KB Every location Disabled	Specify whether to execute a memory test for extended memory or not. If the test is executed, specify the block size.	
Memory RAS Feature	Interleave Mirror	Disables or enables the memory mirroring feature.	
Spanning	Disabled Enabled	Disables or enables online spare memory feature.	

PCI Configuration Submenu

Table 9: PCI Configuration Submenu

Feature	Choices or Display Only	Description	Your Setting
Onboard Video Controller	Select submenu		

Table 9: PCI Configuration Submenu (Continued)

Feature	Choices or Display Only	Description	Your Setting
Onboard LAN	Select submenu		
PCI Slot 1 to 5	Disabled Enabled	<p>Displays a submenu to specify whether to enable or disable the BIOS on the device (board) connected to the corresponding PCI slot.</p> <p>Set this item to Enabled when:</p> <ul style="list-style-type: none"> - Installing graphics accelerator board. - The disk array controller or SCSI controller is connected with the hard disk drive which contains an OS. <p>Set this item to Disabled when the LAN controller which contains ROM BIOS is used but the board does not provide network booting.</p> <p>Disabling the Option ROM Scan saves memory consumption and time for startup.</p>	

*PCI Device, Onboard Video Controller Submenu***Table 10: PCI Device, Onboard Video Controller Submenu**

Feature	Choices or Display Only	Description	Your Setting
VGA Controller	Disabled Enabled	Enables or disables the onboard VGA controller.	
Onboard VGA Option ROM Scan	Auto Force	<p>Allows selecting the onboard VGA controller or optional PCI VGA controller as the display device that will be active when the system boots.</p> <p>The "Force" option is selected to use the onboard VGA controller if the optional PCI VGA controller is installed in the system.</p>	

*PCI Device, Onboard LAN Submenu***Table 11: PCI Device, Onboard LAN Submenu**

Feature	Choices or Display Only	Description	Your Setting
LAN Controller	Disabled Enabled	This option allows you to enable or disable the onboard LAN controller	

Table 11: PCI Device, Onboard LAN Submenu (Continued)

Feature	Choices or Display Only	Description	Your Setting
LAN1 Option ROM Scan	Disabled Enabled	Enables or disables the BIOS scan of the onboard LAN controller.	
LAN2 Option ROM Scan	Disabled Enabled	Enables or disables the BIOS scan of the onboard LAN controller.	

Peripheral Configuration Submenu

 **Caution**

Note that the interrupt and/or base I/O address must not conflict with others. If the value set for the interrupt or base I/O address is used in another resource, a yellow asterisk (*) appears. Reassign properly any item with a yellow asterisk.

Table 12: Peripheral Configuration Submenu

Feature	Choices or Display Only	Description	Your Setting
Serial Port A	Disabled Enabled Auto	Enables or disables the serial port A	
Base I/O address	3F8 2F8 3E8 2E8	Set the base I/O address for serial port A	
Interrupt	IRQ3 IRQ4	Set the interrupt for serial port A	
Serial port B	Disabled Enabled Auto	Enables or disables the serial port B	
Base I/O address	3F8 2F8 3E8 2E8	Set the base I/O address for serial port B	
Interrupt	IRQ3 IRQ4	Set the interrupt for serial port B	
USB 2.0 Controller	Disabled Enabled	Enables or disables the USB 2.0 controller.	
Parallel ATA	Disabled Enabled	Enables or disables the Parallel ATA.	

Advanced Chipset Control Submenu


Table 13: Advanced Chipset Control Submenu

Feature	Choices or Display Only	Description	Your Setting
Multimedia Timer	Disabled Enabled	Enables or disables the multimedia timer feature.	
Intel(R) I/O AT	Disabled Enabled	Enables or disables the Intel(R) Acceleration technology.	
Wake on LAN/PME	Disabled Enabled	Enables or disables the remote power-on function through the onboard LAN and PCI devices.	
Wake on Ring	Disabled Enabled	Enables or disables the remote power-on function through a serial port.	
Wake on RTC Alarm	Disabled Enabled	Enables or disables the remote power-on function through the RTC Alarm.	

 **Caution**

When there has been a power shortcut, the remote power-on function (Wake On LAN/PME and Wake On Ring) is disabled at the next boot. Press the POWER switch to restart the system.

Security Menu

 Note: User password can be set only when Administrator password is already set.

Caution

Set the passwords only after OS is installed.

Table 14: Security Menu

Feature	Choices or Display Only	Description	Your Setting
User Password is	Clear Set	Indicates whether the user password is set (view only). Once set, this can be disabled by setting it to a null string, or by clearing password jumper on motherboard (see Configuring Mother Board Jumpers in this Chapter).	
Supervisor Password is	Clear Set	Indicates whether the supervisor password is set (display only). Once set, this can be disabled by setting it to a null string, or by clearing password jumper on motherboard (see Configuring Mother Board Jumpers in this Chapter).	
Set User Password	Up to 8 alphanumeric characters	Supervisor password controls access to the setup utility. When Enter is pressed, the user is prompted for a password; press Esc to abort. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on motherboard (refer to Configuring Mother Board Jumpers in this chapter).	
Set Supervisor Password	Up to 8 alphanumeric characters	When the <Enter> key is pressed, the user is prompted for a password; press ESC key to abort. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on motherboard (refer to Configuring Mother Board Jumpers in this chapter).	

Table 14: Security Menu (Continued)

Feature	Choices or Display Only	Description	Your Setting
Password On Boot	Disabled Enabled	Specify whether to request a password entry at boot-up. Administrator password setup is required. Only available if supervisor password is set.	
Fixed Disk Boot Sector	Normal Write Protect	Allows to write protect hard disk boot sector to protect against viruses.	
Power Switch Inhibit	Disabled Enabled	Enables or disables the POWER switch. If "Enabled" is selected, power-off with the POWER switch becomes unavailable after OS boot-up. (Forced shut down also becomes unavailable. Forced shut down is a feature to shut down by pressing the POWER switch for at least four seconds.)	

Server Menu

Table 15: Server Menu

Feature	Choices or Display Only	Description	Your Setting
System Management	Select Submenu		
Console Redirection	Select Submenu		
Event Log Configuration	Select Submenu		
Assert NMI on PERR	Disabled Enabled	Sets support of PCI bus parity error (PERR).	
Assert NMI on SERR	Disabled Enabled	Sets support of PCI bus system error (SERR).	
FRB-2 Policy	Disable FRB-2 Timer Disable BSP Do not Disable BSP Retry 3 Times	Sets the FRB level 2 timer.	
Boot Monitoring	Disabled 5 Minutes 10 Minutes 15 Minutes 20 Minutes 25 Minutes 30 Minutes 35 Minutes 40 Minutes 45 Minutes 45 Minutes 50 Minutes 55 Minutes 60 Minutes	Sets whether the boot monitoring function is disabled, or, if it is enabled, sets the time limit for time out. It is mandatory to install the NEC ESM PRO Agent in order to use this function.	

Table 15: Server Menu (Continued)

Feature	Choices or Display Only	Description	Your Setting
Boot Monitoring Policy	Retry 3 Times Retry Service Boot Always Reset	<p>Specifies what happens when a time out is detected during boot monitoring.</p> <p>When Retry 3 Times is selected, the system is reset after a time out occurrence, and tries 3 times to boot the OS.</p> <p>When Retry Service Boot is selected, the system is reset after a time out occurrence, and tries 3 times to boot the OS. The system then tries to boot from the service partition (3 times).</p> <p>When Always Reset is selected, the system is reset after the time out occurrence, and tries repeatedly to boot the OS.</p>	
Thermal Sensor	Disabled Enabled	<p>Specifies whether the thermal sensor monitoring function is enabled or not.</p> <p>If a thermal error is detected while this parameter is enabled, the system stops at the end of the POST.</p>	
BMC IRQ	Disabled IRQ 11	Determines the routing of the BMC Interrupt.	
POST Error Pause	Disabled Enabled	<p>Specifies whether the system waits for user intervention on critical POST errors.</p> <p>If no keyboard is connected to the system, this option is ignored and the system always continues to bootup.</p>	
AC-LINK	Stays Off Last State Power On	<p>Sets the AC-LINK feature.</p> <p>Determines the mode of operation if a power loss occurs.</p>	
Power On Delay Time (Sec)	0 - 255	<p>Sets the power-on delay time within a 0 to 255 seconds range.</p> <p>This parameter is valid when "Power On " or "Last State" is specified for AC Link.</p>	
Platform Event Filtering	Disabled Enabled	This item is meaningless when the notification feature of the Remote Management Card is enabled.	

 **Caution**

- To power on the server from the UPS (Uninterruptible Power Supply), select [Server] - [AC LINK] - [Power On].
 - If the server is connected to the UPS, set at least 10 seconds delay in the power-on schedule.
-

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

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

System Management Submenu

Table 16: System Management Submenu

Feature	Choices or Display Only	Description	Your Setting
BIOS Version	e.g. 4N34	Displays the current BIOS version number.	
Board Part Number		Displays the motherboard part number.	
Board Serial Number		Displays the motherboard serial number.	
System Part Number		Displays the system part number.	
System Serial Number		Displays the system serial number.	
Chassis Part Number		Displays the chassis part number.	
Chassis Serial Number		Displays the chassis serial number.	
Onboard LAN1 MAC Address		Displays the Onboard LAN1 port MAC address.	
Onboard LAN2 MAC Address		Displays the Onboard LAN2 port MAC address.	
Management LAN MAC Address		Displays the Management LAN port MAC address.	
BMC Device ID		Displays the BMC device ID.	
BMC Device Revision		Displays the BMC device revision.	
BMC Firmware Revision		Displays the BMC firmware revision.	
SDR Revision		Displays the sensor data record revision.	
PIA Revision		Displays the platform information area revision.	

Console Redirection Submenu

Table 17: Console Redirection Submenu

Feature	Choices or Display Only	Description	Your Setting
BIOS Redirection Port	Disabled Serial Port A Serial Port B	Specify the serial port to which a hardware console is connected.	
ACPI Redirection Port	Disabled Serial Port A Serial Port B	Specify the serial port to which an ACPI console is connected.	
Baud Rate	9600 19.2K 38.4K 57.6K 115.2K	Selects a baud rate for communications with the connected HW console.	
Flow Control	None XON/XOFF CTS/RTS CTS/RTS + CD	Select a flow control method.	

Table 17: Console Redirection Submenu (Continued)

Feature	Choices or Display Only	Description	Your Setting
Terminal Type	PC ANSI VT100+ VT-UTF8	Specify the type of remote console.	
Remote Console Reset	Disabled Enabled	Enables or disables the reset function when an Escape command is sent from the remote console.	

*Event Log Configuration Submenu***Table 18: Event Log Configuration Submenu**

Feature	Choices or Display Only	Description	Your Setting
Clear All Event Logs		Press Enter and select Yes to clear the event log.	

Boot Menu

Table 19: Boot Menu

Feature	Description
DVD-ROM Drive	This shows the factory default boot order.
+Removable Devices	When booting, the server searches for devices in the order set in this menu. The server starts the software when finding the boot software. Move the cursor to the desired device with the up or down arrow keys and change the priority with the <+> and <-> keys
+ Hard Drive	

 **Caution**

To boot ExpressBuilder, leave the factory default boot order.

Exit Menu

You can make the following selections on the Exit Menu. Select an option using the up or down arrow keys, then press <Enter> to execute the option. Pressing <Esc> does not exit this menu. You must select one of the items from the menu or menu bar to exit.

Table 20: Exit Menu

Choices	Description
Exit Saving Changes	Exit after writing all modified Setup item values to NVRAM. F10 key can be used for this operation.
Exit Discarding Changes	Exit leaving NVRAM unmodified. User is prompted if any of the setup fields were modified. Esc key can be used for this operation.
Load Setup Defaults	Load default values for all SETUP items. F5 key can be used for this operation.
Load Custom Defaults	Loads the custom defaults for the BIOS Setup options.
Save Custom Defaults	Saves the current values as custom defaults. This menu is only available once the Load Custom Defaults option has been used.
Discard Changes	Read previous values of all Setup items from NVRAM.
Save Changes	Save changes to NVRAM without exiting the Setup.

RAID Configuration

This section describes how to configure the internal hard disk drives as the disk array drive by using the onboard RAID controller. Refer to the manual of the optional disk array controller for how to configure the hard disk drives by using the optional disk array controller.

To use the hard disk drives installed in the disk expansion unit in a disk array, the optional disk array controller is necessary. Refer to the manual of the optional disk array controller or disk expansion unit for details.

Onboard RAID Features

You can configure a disk array (RAID0, RAID1, or RAID10) using the onboard RAID controller of the server.

RAID0 (striping)

Stores data on two, three, or four hard disk drives by dividing it (striping). All the hard disk drives can be accessed at the same time. This improves disk access performance in comparison to using a single hard disk drive.

Caution

- RAID0 does not have data redundancy. When a hard disk drive failure occurs, data cannot be restored.
 - The logical capacity of the array becomes a multiple of the connected hard disk drives.
-

RAID1 (mirroring)

Stores the data being saved to one hard disk drive to another hard disk drive. This method is called "mirroring." The data stored onto one hard disk drive is simultaneously stored onto another hard disk drive. When a hard disk drive becomes faulty, the one with the same data can be used. This ensures continuous operation.

Caution

- RAID1 reads or writes data to/from the several hard disk drives at the same time. The disk access performance is lower than that of a single disk.
 - The logical capacity of the array is equal to one of the connected hard disk drives.
-

RAID10 (spanning of RAID1)

RAID10 is a RAID level combining RAID0 and RAID1.

Stores data on hard disk drives by dividing it (striping). Then, each striped data is written onto hard disk drives in mirroring mode. Owing to this feature, high disk access performance of RAID0 and, in addition, high reliability of RAID1 can be achieved.

Caution

The logical capacity of the array is equal to half the total capacity of the connected hard disk drives.

Installing the Hard Disk Drives


Install two or more SAS hard disk drives to your server. *See “[Installing and Swapping a Hard Disk Drive in a Hot-Swap Disk Drive Bay](#)” on page 116.*

Caution

Use two hard disk drives of the same speed.
Also use two hard disk drives of the same capacity if you are going to configure the array in RAID1.

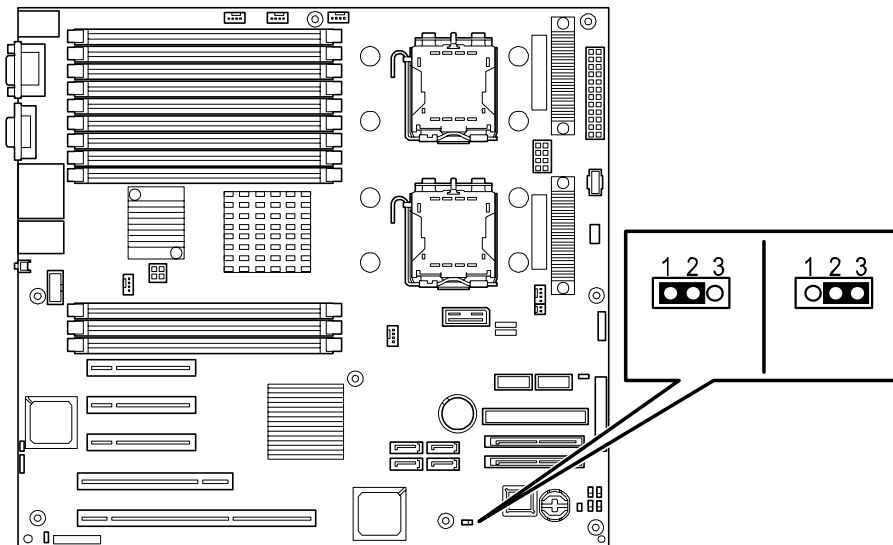
Enabling the RAID Feature

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

 **Note:** *The factory-set value is to use the hard disk drive as a single disk drive.*

1. See the section *“[Preparing Your System for Upgrade](#)” on page 110.*

2. Remove the side cover.
3. Locate the position of the RAID configuration jumper on the motherboard as shown below.



4. Remove the jumper from position 1 – 2 on jumper block.
5. Reinstall the jumper on position 2 – 3 on jumper block.
6. Reinstall the side cover removed in Step 2.
7. Plug the power cord to your server and turn on the server.

Running LSI Logic Software RAID Setup Utility

1. When the full screen logo appears after you have powered on the server, press **Esc**. The POST screen appears.
2. Check the description shown on the POST screen, then press **Ctrl + M**. The LSI Logic Software RAID Setup Utility starts.

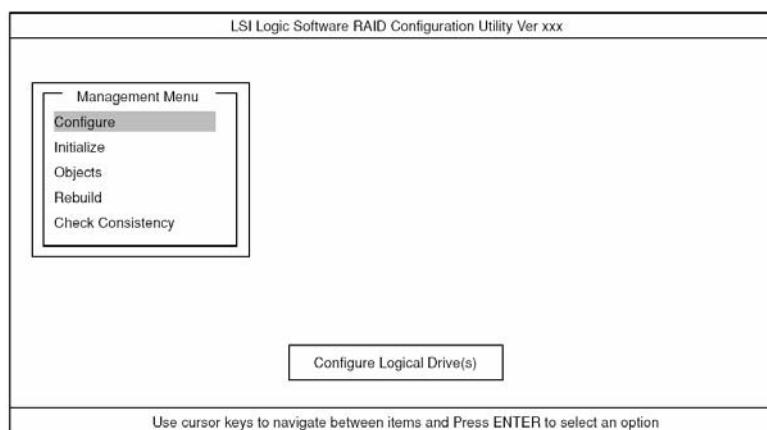


Figure 39: LSI Logic Software RAID Configuration Utility TOP Menu (Management Menu)

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

When a confirmation message appears, select [Yes].

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

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

Menu Tree

+ : Selection/execution parameter

← : Setting parameter.

• : Information display

> : Can be set (modified) after creation of logical drive

Table 21: Menu Tree

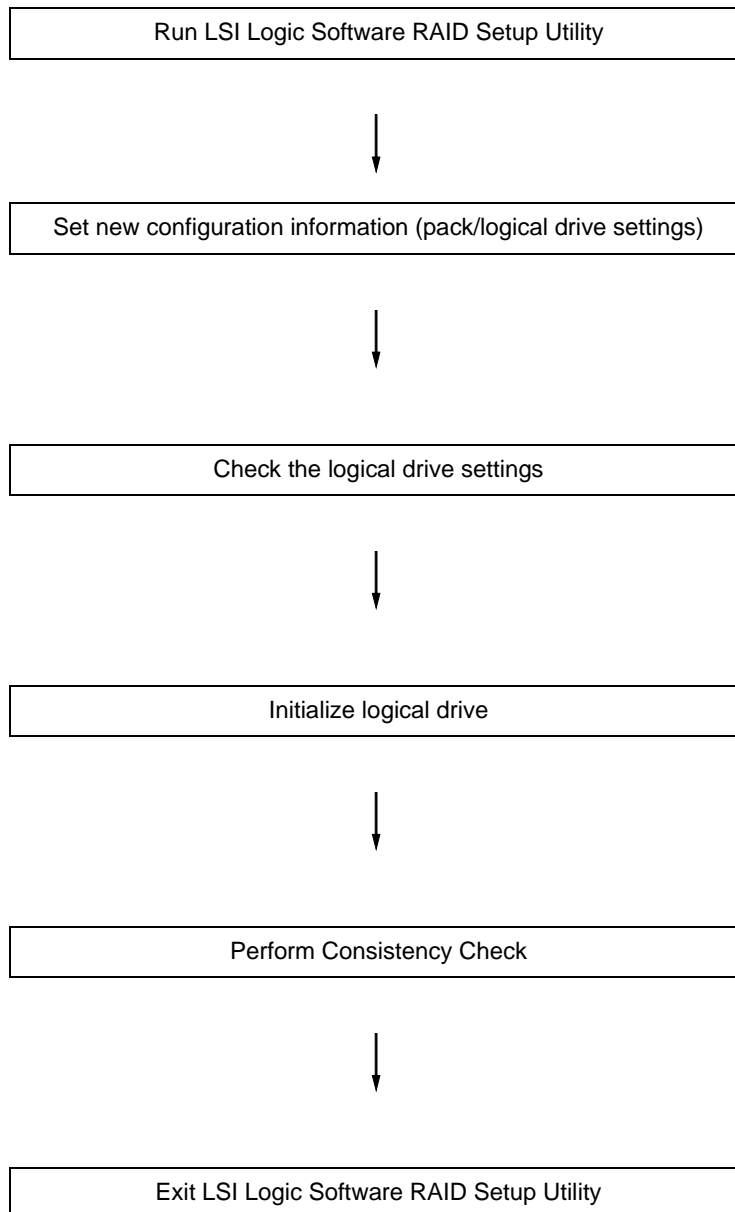
Menu	Description
+Configure	Performs Configuration settings
+Easy Configuration	Set configuration (Using fixed value)
+New Configuration	Set new configuration
+View/Add Configuration	Additional setting / viewing configuration
+Clear Configuration	Clear configuration
+Select Boot Drive	Chose Bootable Logical Drive
+Initialize	Initialize logical drive
+Objects	Various settings
+Adapter	Set disk array controller
+Sel. Adapter	Clear configuration
←Rebuild Rate	30
←Chk Const Rate	30
←FGI Rate	30
←BGI Rate	30
←Disk WC	Off
←Read Ahead	On
←Bios State	Enable
←Stop on Error	No
←Fast Init	Enable
←Auto Rebuild	On
←Auto Resume	Enable
←Disk Coercion	1GB
←Factory Default	
+Logical Drive	Logical drive operation
+Logical Drives	Select logical drive (when multiple logical drives exist)
+Initialize	Initialize logical drive
+Check Consistency	Check logical drive redundancy

Table 21: Menu Tree

Menu	Description
+View/Update Parameters	Display logical drive information
• RAID	Display RAID level
• SIZE	Display logical drive capacity
• Stripe SIZE	Display stripe size
• #Stripes	Display the number of hard disk drives in logical drive
• State	Display logical drive status
• Spans	
• Disk WC	Off: Write through On: Write back
• Read Ahead	
+Physical Drive	Physical drive operation
+Physical Drive Selection Menu	Select physical drive
+Make HotSpare	Set as hot-spare disk for auto rebuilding
+Force Online	Make a disk online
+Force Offline	Make a disk offline
+Drive Properties	Display hard disk drive information
• Device Type	Hard disk drive type
• Capacity	Hard disk drive capacity
• Product ID	Hard disk drive model
• Revision No.	Hard disk drive revision
+Rebuild	Perform rebuilding
+Check Consistency	Perform logical drive redundancy check

Operating Procedures for Setup Utility

Creating/Adding Configuration



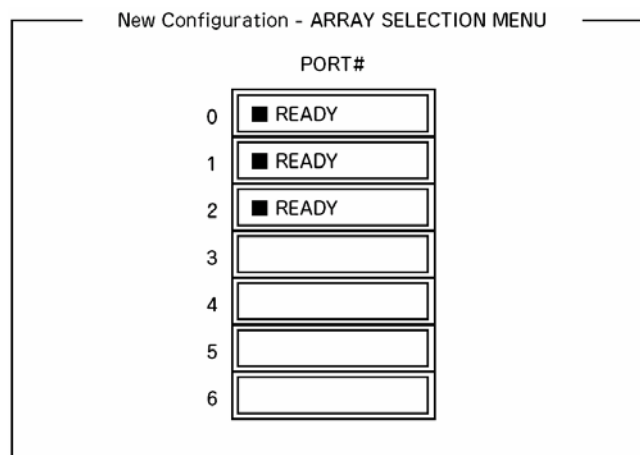
1. Run the LSI Logic Software RAID Setup Utility.
2. Select "Configure" → "New Configuration" from the TOP menu (Management Menu).
Select "View/add Configuration" to add a configuration.

⚠ Caution

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

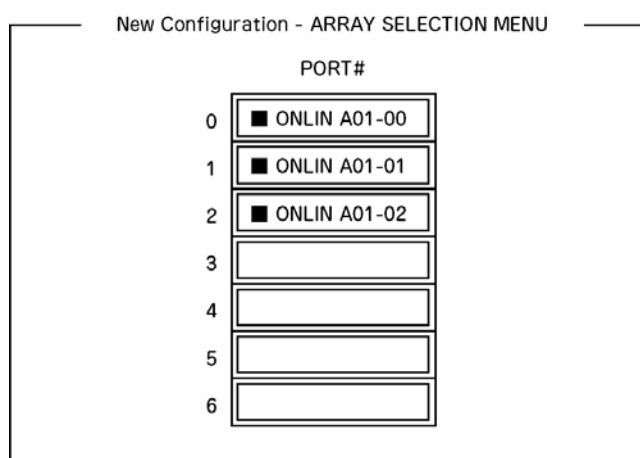
3. When a confirmation message (Proceed?) is displayed, select "Yes."

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

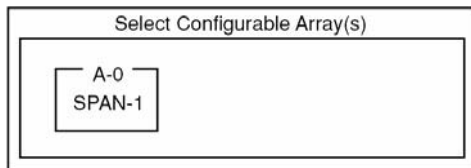


4. Move the cursor onto the hard disk drive to be packed by using the cursor key and then press **Space** to select the hard disk drive.

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



5. Press **F10** to set "Select Configurable Array(s)".
6. Press **Space**.
SPAN-1 is set.



7. Press **F10** to create a logical drive.
The "Logical Drives Configure" screen appears. (The figure below shows an example of RAID1 configured with two hard disk drives.)

Logical Drives Configured					
LD	RAID	Size	#Stripes	StrpSz	Drive-State
1	5	xxxMB	3	64KB	OPTIMAL

Logical Drives1
RAID = 5
Size = xxxMB
WC = Off
RA = On
Stripe Size
Accept
Span = NO

8. Select "RAID," "Size", "WC", "RA", or "Span" by using cursor keys. Then press **Enter** to fix the selection and set each value.
 - (1) "RAID": Sets the RAID level.

Parameter	Remarks
0	RAID0
1	RAID1
5	RAID5 (option)
10	Spanning of RAID1

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

- (2) "Size": Sets the logical drive size.
Up to 40 logical drives can be created per disk array controller.
- (3) "WC": Sets the parameter for the Disk Write Cache.

Parameter	Remarks
Off	Write through
On	Write back

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

Parameter	Remarks
Off	Does not perform read ahead
On	Performs read ahead

(5) "Stripe Size": Sets stripe size.

(6) "Span": Sets the Span.

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

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

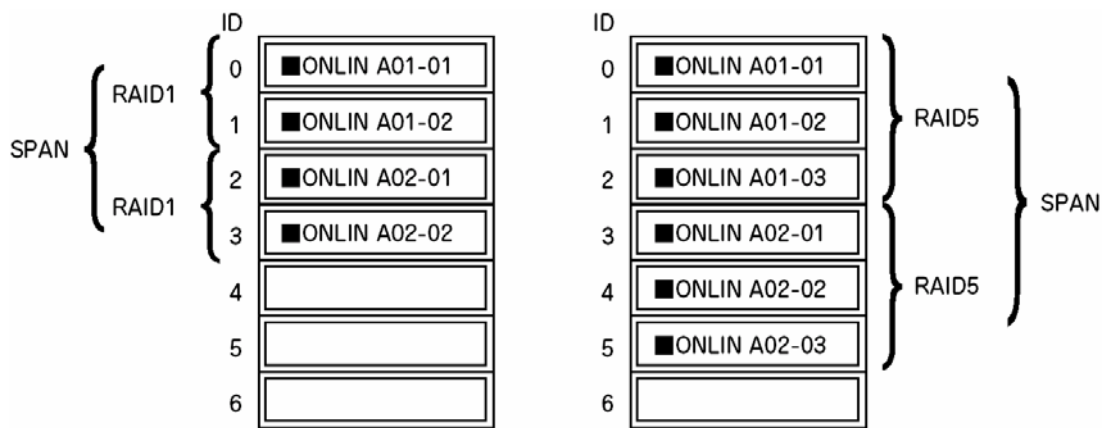


Figure 40: Spanning of RAID1

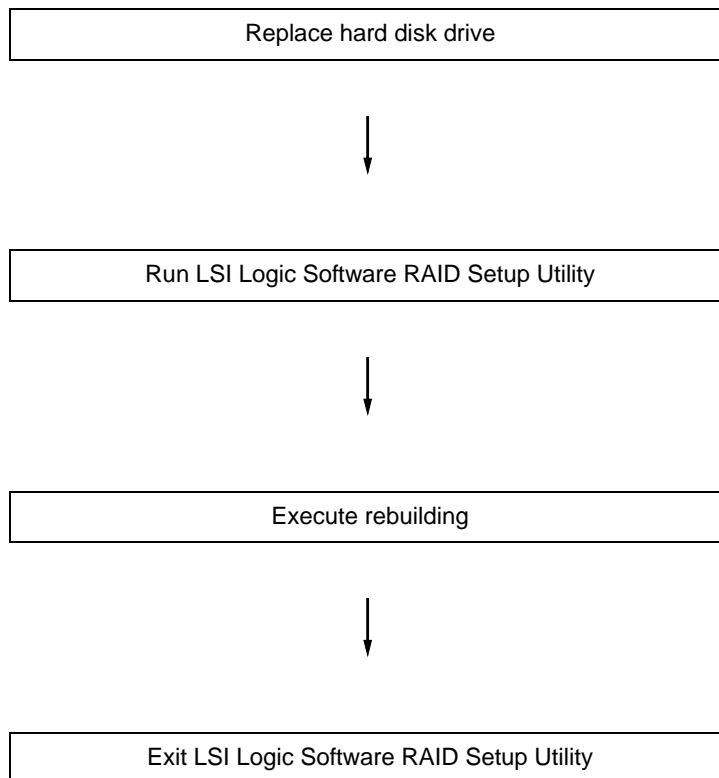
9. When all the settings are completed, select "Accept" and then press **Enter** to create the logical drive.
 The created logical drive is displayed in the "Logical Drive Configured" screen.
10. After creating a logical drive, press **Esc** to close the screen.
 Go back to the "Save Configuration?"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

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

 **Caution**

- Be sure to execute Check Consistency after creating configuration.
 - Check Consistency has two modes: "check and recover" and "check only".
-

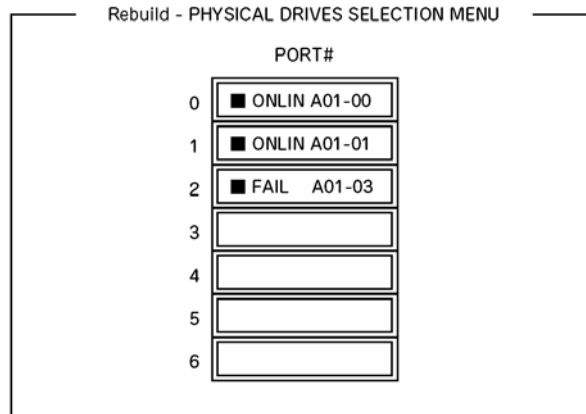
Manual Rebuild



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

2. Run the LSI Logic Software RAID Setup Utility.
3. Select "Rebuild" from the TOP menu.

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



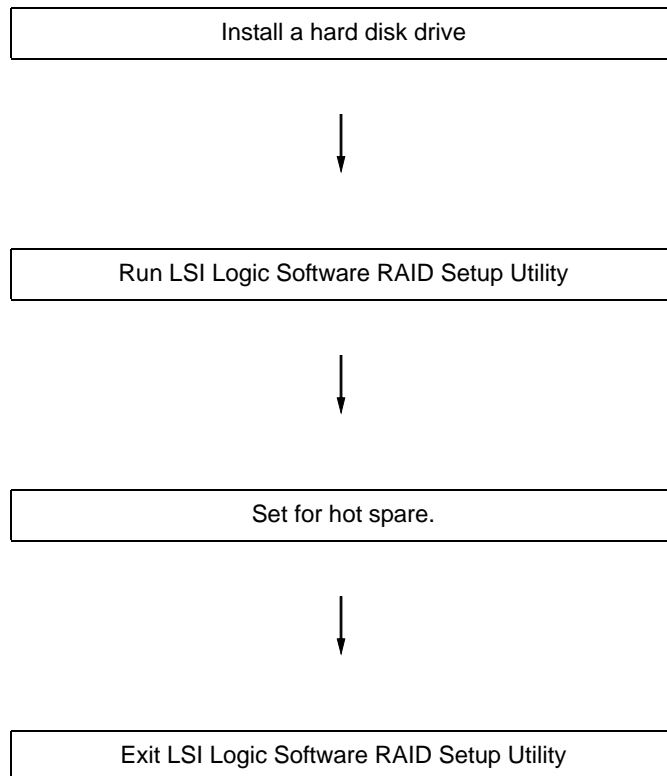
4. Move the cursor onto the hard disk drive displaying "FAIL" and then press **Space** to select it.
Multiple hard disk drives can be selected (simultaneous rebuilding.)
5. The "FAIL" indication for the hard disk drive selected starts blinking.
6. When the hard disk drive has been selected, press **F10** to start rebuilding.
7. Press "Yes" when prompted for confirmation.

The rebuild process starts.

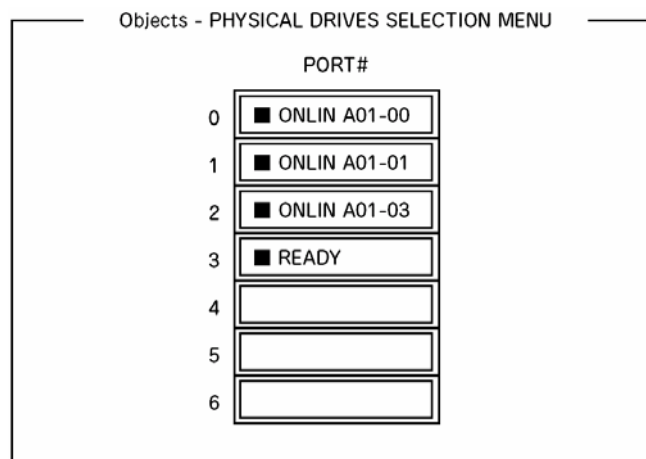
When the progress bar in the "Rebuild Physical Drives in Progress" screen indicates 100%, the rebuilding is completed.

- Press **Esc** to return to the TOP menu and exit the LSI Logic Software RAID Setup Utility.

Setting Hot Spare

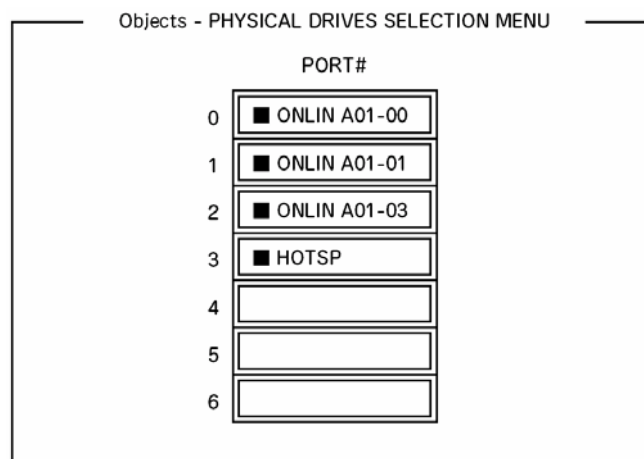


- Install a hard disk drive to be used as hot spare, and then turn on the server.
- Run the LSI Logic Software RAID Setup Utility.
- Select "Objects" → "Physical Drive" from the TOP menu.
The "Objects - PHYSICAL DRIVES SELECTION MENU" screen appears.



- Move the cursor onto the hard disk drive to be used as hot spare and press **Enter**.
- The "Port #X" screen appears. Select "Make HotSpare."
- A confirmation screen appears. Select "Yes."
The hard disk drive indication is changed to "HOTSP."

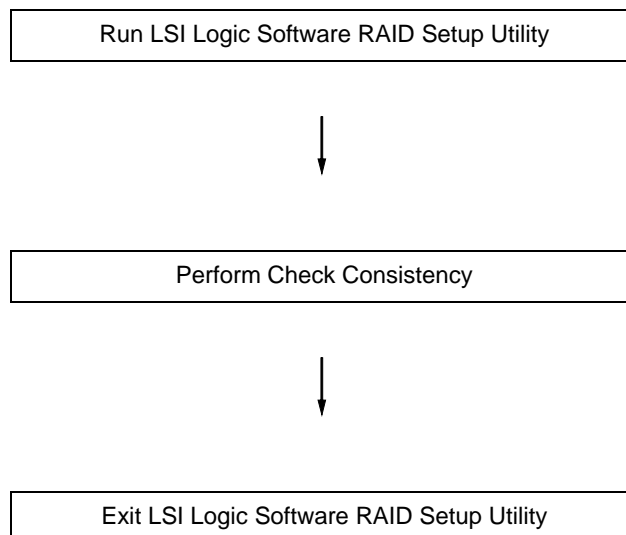
- Press **Esc** to return to the TOP menu and exit the LSI Logic Software RAID Setup Utility.



Caution

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

Check Consistency



- Run the LSI Logic Software RAID Setup Utility.
- Select "Check Consistency" from the TOP menu.

The "Logical Drives" screen appears.

3. Move the cursor onto the logical drive to be checked, and press **Space** to select it.
4. When a logical drive has been selected, press **F10** to start the consistency check.
5. When prompted to do so, press "Yes".
The consistency check starts.
When the progress bar in the "Check Consistency Progress" screen indicates 100%, the consistency check is completed.
6. Press **Esc** to return to the TOP menu and exit the LSI Logic Software RAID Setup Utility.

Caution

- Be sure to execute Check Consistency after creating a configuration.
 - Check Consistency has two modes: "check and recover" and "check only".
-

Others

Clear Configuration

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

Notes:

- *When the configuration information on the disk array controller and that on the hard disk drive do not match (excluding at the replacement of a faulty disk array controller), configuration may fail if you select the configuration information on the disk array controller. In this case, execute "Clear Configuration" to create configuration again.*
 - *LSI Logic Software RAID Setup Utility cannot delete each logical drive. Use MegaRAID Storage Manager instead.*
-

Force Online

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

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

Rebuild Rate

Sets the Rebuild Rate.

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

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

Hard disk drive information

Checks hard disk drive information.

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

Add-in Card's BIOS

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

When the server has multiple optional PCI boards installed, the server first displays the start-up message of the BIOS SETUP Utility of the mother board.

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

Configuring MotherBoard Jumpers

Only a qualified technical person should perform the procedures in this section.

Caution

Electrostatic discharge (ESD) can damage the motherboard. Modify the motherboard only at an ESD workstation. Otherwise, wear an antistatic wrist strap attached to chassis ground.

The motherboard jumpers enable you to set specific operating parameters for your system. A jumper is a small plastic-encased conductor (shorting plug) that slips over two jumper pins.

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

Note:

- *Clearing the CMOS data resumes the factory-set configuration data.*
 - *After clearing CMOS, you must run the BIOS SETUP utility and execute the following menus to reconfigure your mother board.*
 - *Load Setup Defaults in the Exit menu*
 - *Memory Retest of Memory Configuration in the Advanced menu*
 - *Processor Retest of Processor Settings in the Main menu*
-

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

Caution

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

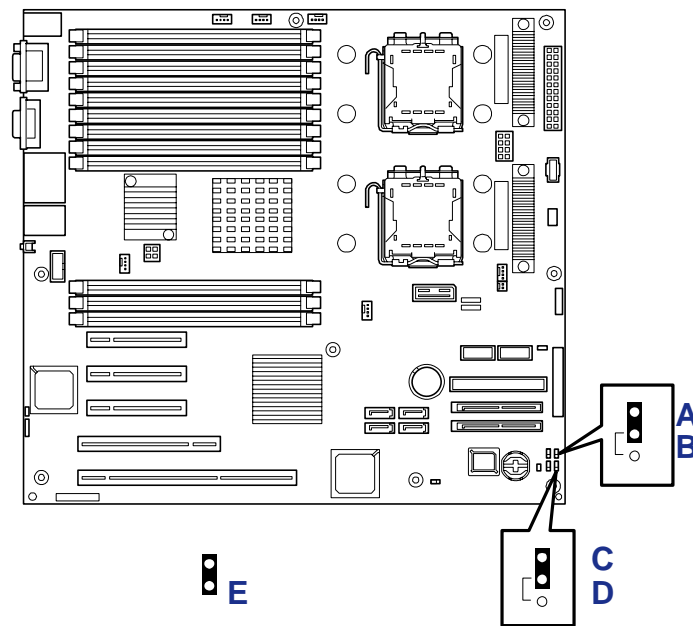


Figure 41: Motherboard Jumpers Location

- A: CMOS Jumper (CMOS Protect setting)
- B: CMOS Jumper (CMOS Clear setting)
- C: Password Jumper (Password Protect setting)
- D: Password Jumper (Password Clear setting)
- E: Jumper

Moving Motherboard Jumpers

Warning

Before doing the procedures in this section, make sure that your system is powered off and unplug the AC power cords from the back of the chassis. Failure to disconnect power before moving the jumpers can result in personal injury and equipment damage.

Observe static precautions. Use an antistatic wrist strap.

Clearing and Changing the Passwords

1. See the section [“Preparing Your System for Upgrade” on page 110](#).
2. Remove the right side door. [See “Removing and Installing the Right Side Door” on page 111](#).
3. Locate the position of the jumpers on the motherboard you are changing. See [“Motherboard Jumpers Location” on page 107](#). To change a jumper setting, use a pair of needle-nose pliers or your fingers to remove the jumper from its

current location. Position the jumper over the two pins for the desired setting and press it onto the pins. Be careful not to bend the pins.

4. To clear the BIOS password, remove the jumper strap on the BIOS password clear jumper.
5. Connect the power cord(s), power on the system and while waiting for POST to complete, press the **F2** key to enter BIOS setup. This automatically clears all passwords, provided you exit and save the BIOS setup.
6. Power off the system and remove the power cord(s).
7. Move the Clear Password jumper to its default position.
8. Replace the right side door, connect the power cord(s) and power on the system.
9. To specify a new password run the BIOS Setup Utility as described earlier in this chapter

Clearing CMOS

1. See the section [“Preparing Your System for Upgrade” on page 110](#).
2. Remove the right side door. [See “Removing and Installing the Right Side Door” on page 111](#).
3. Locate the position of the jumpers on the motherboard you are changing. See [“Motherboard Jumpers Location” on page 107](#). To change a jumper setting, use a pair of needle-nose pliers or your fingers to remove the jumper from its current location. Position the jumper over the two pins for the desired setting and press it onto the pins. Be careful not to bend the pins.
4. For Clearing the CMOS, move the jumper strap to the CMOS clear position.
5. Refer to the previous illustration to find the location of the jumper.
6. Wait for a while (about 5 seconds), and then reinstall the jumper block to the default position.
7. Reinstall the right side door removed in Step 2.
8. Plug the power cord to your server and turn on the server.
9. Press **F2** at the prompt to run the BIOS SETUP utility, and select "Load Setup Defaults" at the Exit menu.

Upgrading Your System

General Information

Warning

The DC push-button on/off switch on the front panel does not turn off completely the system AC power. Also, +5vdc is present on the motherboard whenever the AC power cord is connected between the system and an AC outlet. Before doing the procedures in this manual, make sure that your system is powered off and unplug the AC power cord from the back of the chassis. Failure to disconnect power before opening your system can result in personal injury and equipment damage.

Caution

Operating your system with the right side door removed can damage your system components. For proper cooling and airflow, always replace the right side door before powering on your system.

Warning

Avoid burns. If the system has been running, any installed processor and heat sink on the processor board(s) will be hot. To avoid the possibility of a burn, be careful when removing or installing components that are located near processors.

Contact your sales representative or dealer for a list of approved optional peripheral devices.

Static Precautions

An electrostatic discharge (ESD) can damage disk drives, option boards, and other components. You can provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground when handling system components.

Electronic devices can be easily damaged by static electricity. To prevent damage, keep them in their protective packaging when they are not installed in your system.

Equipment Log

Use the equipment log form located at the end of this guide to record the model and serial number of your system, all installed options, and any other pertinent information specific to your system. You will need this information when configuring your system.

Tools Recommended for Upgrading Your System


Depending on the upgrade, you will need one or more of the following tools:

- Phillips screwdriver (#1 bit and #2 bit)
- Flat-head screwdriver
- Small needle nose pliers
- Pen or pencil
- ESD workstation or antistatic wrist strap (recommended)

Preparing Your System for Upgrade

To prepare your system for installation or removal of system component:

1. Observe the safety and ESD precautions listed under *General Information* and *Static Precautions* at the beginning of this chapter.
2. Shutdown the operating system (OS).
3. If necessary, press the power on/off switch on the front panel of the server (see [See “Powering On Your System” on page 66.](#)). The power-on LED goes out.
4. Power off the peripheral devices.
5. Unplug the system power cord(s) from the AC wall outlet(s).

 *Note: If the system power cord is connected to a power control unit such as an UPS (Uninterruptible Power Supply), refer to the UPS user's guide for proper power-off procedures.*

6. Unplug all the I/O cables connected to the rear panel of your system.

Removing and Installing the Right Side Door

Removing the Right Side Door

To install options in your system, you must remove the right side door of the system (as viewed from the rear).

The left panel of the system (as viewed from the rear) does not have to be removed.

Caution

For proper cooling and airflow, do not operate the system with the right side door removed.

Always **replace** the right side door before powering on the system.

Warning

If you are removing the right side door after the system is set up, you must first power off the system and all external devices and then **unplug** the system power cord(s).

To remove the right side door:

1. Prepare your system for upgrade. See [“Preparing Your System for Upgrade” on page 110](#).
2. Remove the two thumbscrews (A in the figure below) securing the right side door to the chassis.
3. Slide the right side door slightly towards the rear of the chassis. This unlocks the locking fingers behind the right side door.
4. Pull the right side door out and away from the chassis.

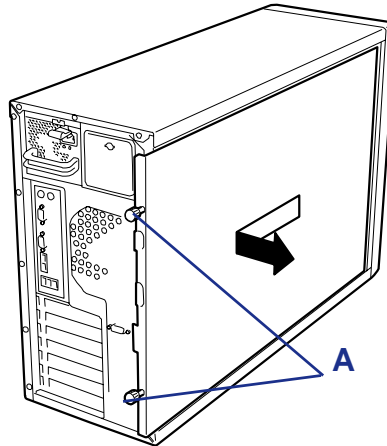


Figure 42: Removing the Right Side Door

A: Thumbscrews

Installing the Right Side Door

1. Check that no tools or loose parts have been left inside the system chassis.

2. Make sure that option boards are firmly seated in their respective slots and that the interior cables are properly connected.
3. Insert the locking fingers on top and bottom of the right side door into their slots on the chassis.

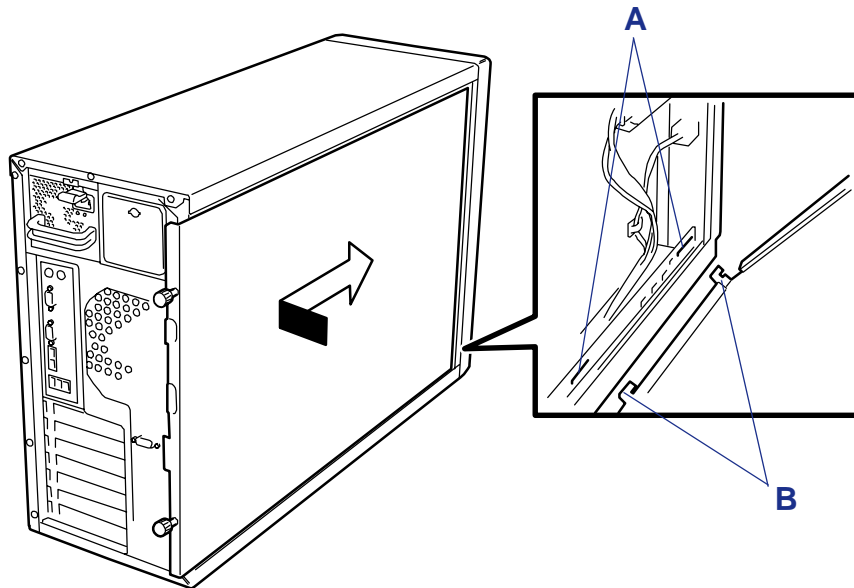




Figure 43: Installing the Cover

A: Holes

B: Holes

 **Note:** Ensure that the right side door is installed properly and securely fastened. A cover sensor (intrusion switch) monitors the right side door.

4. Slide the right side door forward as far as it will go.
5. Secure the right side door thumbscrews in their holes.

 **Note:** If your system is already set up, plug the system back in, reconnect the peripherals, and power on the peripherals and system.

Removing or Installing the Processor Duct Cover

To install or remove the DIMM or processor, you will need to remove the duct cover.

Caution

Do not assemble the system without installing the duct cover. No duct installed in the system reduces cooling efficiency and can affect performance or cause damage due to overheating.

Removing the Processor Duct Cover

1. Read [“Preparing Your System for Upgrade” on page 110.](#)
2. Position the server unit on its left side (as viewed from the rear).
3. Remove the right side door (see [“Removing the Right Side Door” on page 111.](#))
4. Hold the left side of the duct cover, and push the right end of the tab to release from the chassis.
5. Remove the duct from the chassis.

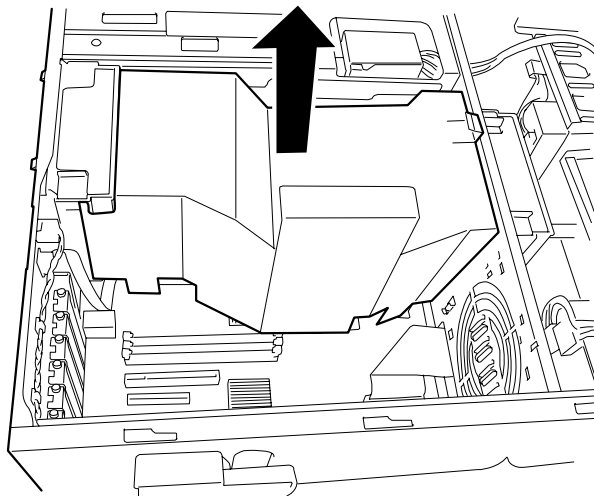


Figure 44: Removing the Processor Duct Cover

Installing the Processor Duct Cover

1. Holding the internal cables clear, place the duct cover into the chassis.
2. Adjust the duct cover until the frame (A) of the right end of the duct is aligned with the hook (B) on the chassis.

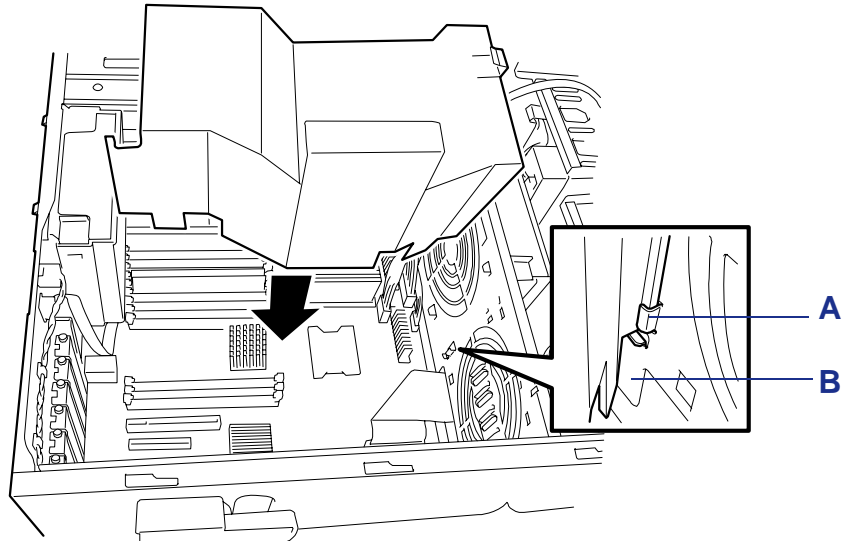


Figure 45: Replacing the Processor Duct Cover

3. Install the right side door (see [“Installing the Right Side Door” on page 112](#)).

Installing and Swapping a Hard Disk Drive in a Hot-Swap Disk Drive Bay

The 3.5-inch hard disk drive bay on the front of the server contains four slots on which hard disks can be installed. The drive bay is not equipped with any hard disks (excluding when one or more built-in hard disks are ordered). Purchase the hard disks additionally if required.

Caution

- Do not use any hard disks not approved by the server manufacturer. If an unapproved third party's hard disk is installed in the server, not only the hard disk but also the server itself may be defective.
 - For the disk array configuration, refer to the manual that comes with the disk array controller.
-

A hard disk having the thickness of 1 inch can be installed on each of the slots. The drive IDs of the slots are fixed to ID0 to ID3 from bottom to top.


In the configuration at the shipment, the cable on the 3.5-inch hard disk drive bay is connected to the SAS connector on the mother board.

To provide the disk array configuration, connect the cable on the 3.5-inch hard disk drive bay to the disk array controller. The standard of the hard disk to be added must be the same as that of the existing disks.

Empty hard drive trays are installed in the empty slots of the 3.5-inch hard disk drive bay. This is intended to improve the cooling effect within the server.

Always keep an empty tray in any slot in which a hard disk is not installed.

This section describes how to install a new hard disk drive or swapping out a faulty drive from one of the six hot-swap disk drive. The 3.5-inch disk drives must use the industry standard 80-pin single connector attachment (SCA) connector. Each drive must be installed in a carrier.

 Notes:

- *ESD can damage disk drives, boards, and other parts. This system can withstand normal levels of environmental ESD while you are installing hard drives. However, we recommend that you do all procedures in this chapter only at an ESD workstation or provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground - any unpainted metal surface - on your system when handling parts.*
 - **Swap the hard disk drives without turning off power.** *This is one of the few system procedures that is safe to do with the system power left on. This is true only if a Redundant Array of Independent Disks (RAID) controller module is installed and an appropriate RAID level is chosen and only for the drive/carrier assemblies in the hot-swap bays, not for drives in any other bays.*
-

 **Caution**

Drive manufacturer's caution against moving a disk drive that is still spinning because of possible damage to the drive.

Installing a Hard Disk Drive

1. Observe the safety and ESD precautions listed under [“Upgrading Your System” on page 109](#) and [“Static Precautions” on page 109](#).
2. Prepare your system for upgrade. See [“Preparing Your System for Upgrade” on page 110](#).

Caution

- Fill the bays bottom-to-top.
 - In the disk array configuration, hard disk drives configuring a specific pack should have the same specification including the capacity.
-

3. To remove the disk carrier from the bay where you are installing the hard disk drive:
 - Press the lock on the top of the carrier handle inwards.
The disk carrier is released.

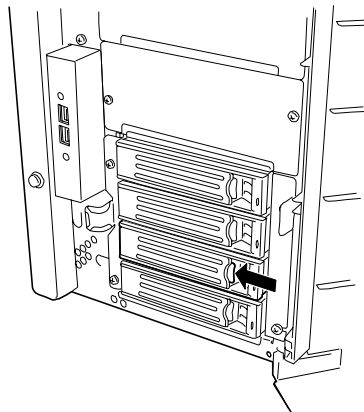


Figure 46: Releasing the Disk Carrier

- Pull the carrier handle towards you.

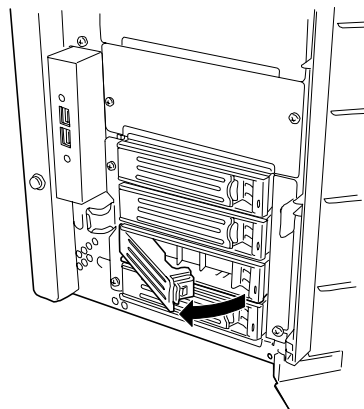


Figure 47: Pulling the Carrier Handle

- Remove the carrier from the bay.

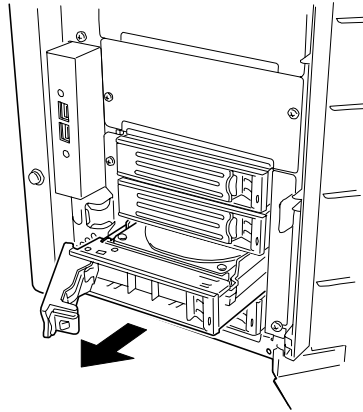
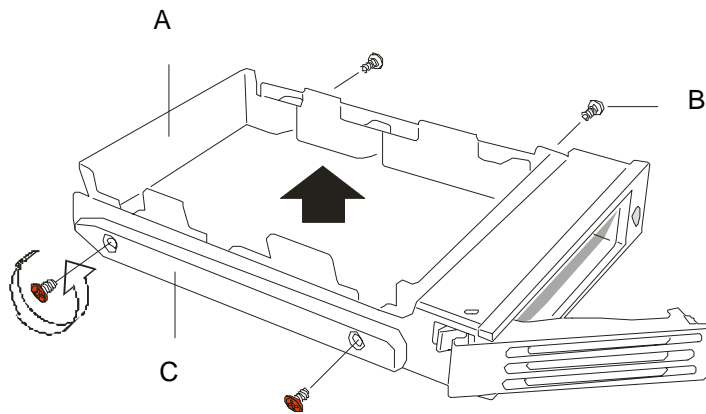


Figure 48: Removing the Carrier from the Bay

⚠ Caution

Do not insert your hand or any tool into the slot with the disk carrier removed. Failure to follow this caution may cause an electric shock or fire.

4. Remove the four screws that hold the air baffle to the carrier and remove the air baffle.



- A Air baffle
- B Screws (4)
- C Drive carrier


Figure 49: Removing the Air Baffle

5. Remove the device from its protective wrapper and place it on an antistatic surface. Record the drive model and serial number in the equipment log.

⚠ Caution

Observe static precautions. Use an antistatic wrist strap.

6. Place the drive into the disk carrier removed in steps 3 and 4 above. Orient the drive so that its component side is down and its data connector is facing the rear of the carrier. The connector should be flush with the rear of the carrier. See the following figure.

 *Note: If the drive comes with drive rails, do not use them. Remove any rails already attached.*

7. Using the four screws removed earlier, attach the carrier to the drive.

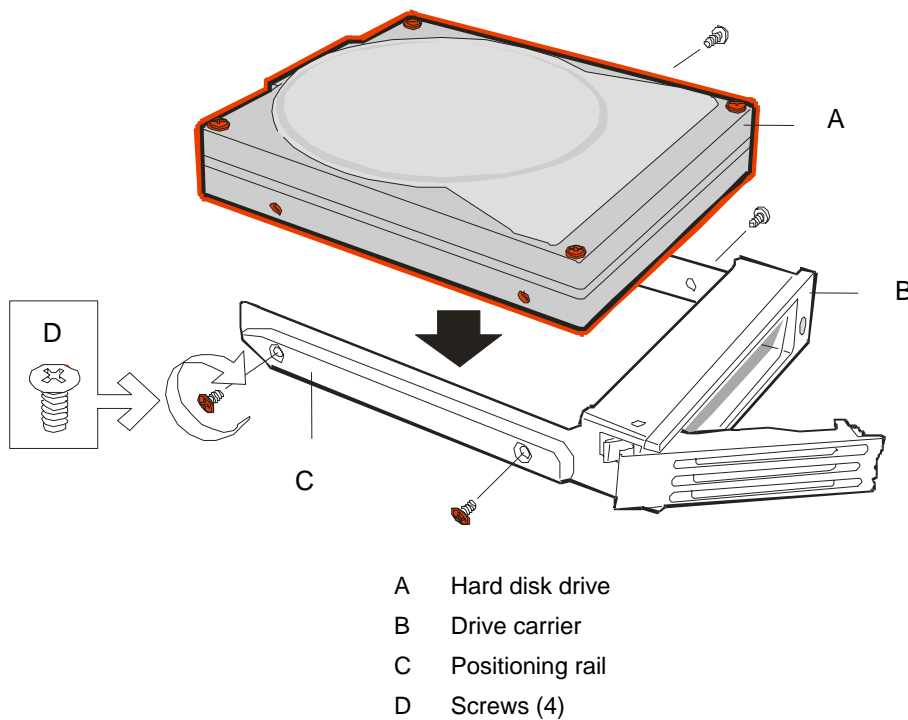


Figure 50: Installing a Hard Disk Drive into the Carrier

8. While holding the drive carrier align it so that it engages the guide rails in the drive bay
9. Push the drive carrier into the bay until the locking tab on the bottom of its handle engages in the bottom frame slot..

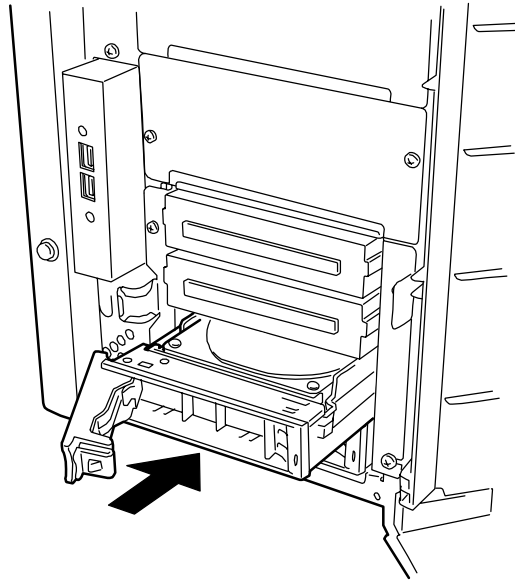
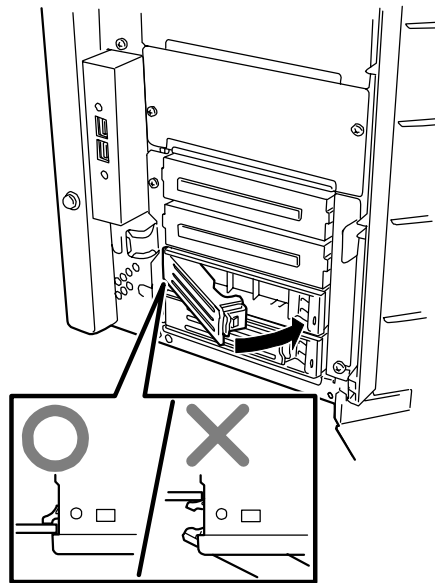


Figure 51: Installing the Carrier into the Bay

10. Push the carrier handle up until the handle clicks and locks in place.



11. Close the front door, plug in the system power cord(s), and turn on the system.

Swapping a Hard Disk Drive

Caution


About data on the hard disk drive:

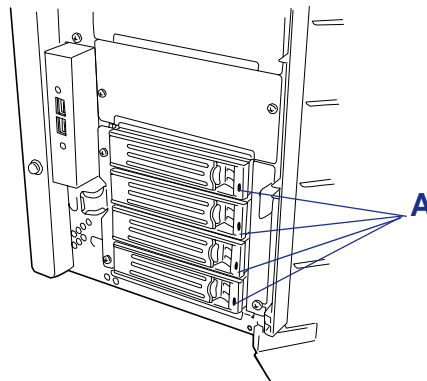
Be sure to take appropriate measures not to leak important data (e.g., customers' information or companies' management information) on the removed hard disk drive to any third parties.

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

We strongly recommended that you use a software or service (both available at stores) for data erasure in order to avoid the trouble explained above. For more information, ask your sales representative.

When you are swapping out a faulty hard disk drive, you can determine which drive to remove by checking its SCSI drive activity/fault LED.

 *Note: To remove a defective hard disk drive, locate the slot on which the disk lamp (A) of the hard disk drive is lit amber.*



-
1. Observe the safety and ESD precautions listed under [“Upgrading Your System” on page 109](#) and [“Static Precautions” on page 109](#).

2. Open the front door of your server.
3. To remove the disk carrier from the hard disk drive bay:

⚠ Caution

Depending on the drive fault, the drive may be still spinning when you remove it. Follow the next steps exactly when removing drives.

- Press the disk carrier handle lock inward to release it.

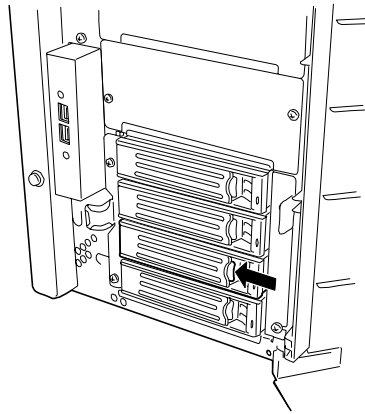


Figure 52: Releasing the Disk Carri

- Grasp the disk carrier handle and pull the faulty disk drive out of the bay far enough to disengage the drive connector from the backplane. Wait 30 seconds until the drive spins down.

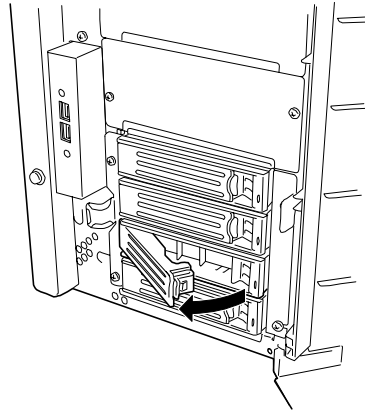


Figure 53: Disengaging the Drive Connector

! Caution

Drive manufacturer's caution against moving a disk drive that is still spinning because of possible damage to the drive.

- Remove the carrier from the drive bay.

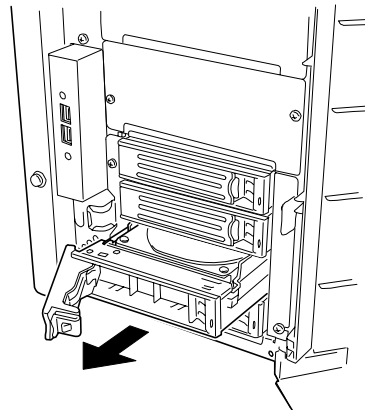


Figure 54: Removing the Carrier from the Bay

4. To install the replacement drive carrier with drive into the bay:
 - Open the disk carrier handle lock.
 - While holding the drive carrier align it so that it engages the guide rails in the drive bay.
 - Push the carrier handle up until the handle clicks and locks in place.
5. Close the front door on the system.
6. If necessary, configure the system as described in [*“BIOS Setup Utility” on page 71.*](#)

Auto Rebuild Functionality

If your server includes a disk array controller, the auto rebuild function can be used to restore data from the defective hard disk drive. The auto rebuild function can write the data saved from a defective hard disk to the replacement disk drive thereby recovering the server to the state before the occurrence of the fault.

The auto rebuild function is valid for disk arrays set to RAID1 or RAID5.

The auto rebuild is automatically started only by the hot-swap of a defective hard disk (or disk replacement in the power-on state). During the auto rebuild, the disk lamp on the hard disk is lit green or amber alternatively.

Warning

- If the auto rebuild fails, the disk lamp on the hard disk drive goes on amber. Provide the disk removal or installation again to run the auto rebuild.
 - If the disk array monitoring utility is installed, the following display or operation may occur. However, the auto rebuild is conducted correctly if the disk lamp of the hard disk drive subject to the auto rebuild is not lit amber after the termination of the auto rebuild.
 - Message "Rebuild was canceled" appears on the screen during the auto rebuild.
 - It seems that the auto rebuild is terminated once and then restarted.
-

Caution

- Do not turn off the power of the server in the interval between a fault of a hard disk to the end of the auto rebuild process.
 - Wait at least 90 seconds from the time you remove a defective disk drive to the time you install the replacement disk drive.
 - If a hard disk is rebuilding, do not replace another disk. (The disk lamp on the hard disk being rebuilt is lit green or amber alternatively.)
-

Installing the optional HDD Cage

Installing an optional HDD cage in the 3.5-inch hard disk drive bay on the front of the server allows the server to be equipped with up to four hard disk drives in addition to four drives normally installable.

Caution

Do not use any hard disks not approved by Bull. If an unapproved third party's hard disk is installed in the server, not only the hard disk drive but also the server itself may be defective. For the disk array configuration, refer to the manual that comes with the disk array controller.

A hard disk drive having thickness of about 1 inch can be inserted to each of the four slots in the HDD cage. ID4 to ID7 are assigned in the order from bottom to top.

If the optional HDD cage is installed in the 3.5-inch hard disk drive bay, the cable attached to the 3.5-inch hard disk drive cage should be connected to the SAS connector on the motherboard.

For the disk array configuration, connect the cable on the 3.5-inch hard disk drive bay to the disk array controller. Additional hard disk drives to be used should have the same standard as the normal hard disk drives.

Empty trays are inserted into the empty slots in the 3.5-inch hard disk drive bay. Remove these trays only to install additional hard disk drives.

Installation

Install the HDD cage in the 3.5-inch hard disk drive bay in the following procedure.

1. Observe the safety and ESD precautions listed under [“Upgrading Your System” on page 109](#) and [“Static Precautions” on page 109](#)
2. Release the lock of the front door by using the security key and open the front door.
3. Remove the right side door. See [“Removing the Right Side Door” on page 111](#).
4. Remove the processor air duct. See [“Removing the Processor Duct Cover” on page 114](#).

The fan unit should be removed to ease the connection of the cables to the connectors on the HDD cage.

5. Remove the four screws holding the dummy HDD cage cover.

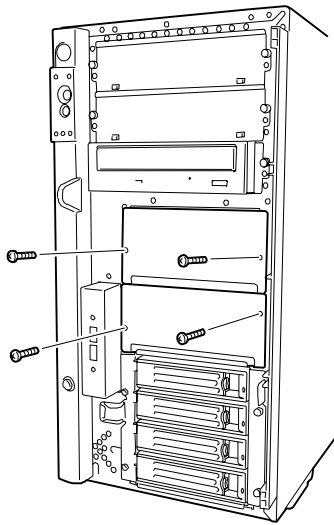


Figure 55: Removing the dummy cover

⚠ Caution

Keep the removed dummy cage cover for future use.

6. Insert the HDD cage to the mating slot.
7. Connect the power cables (P10 and P11) of the server to the mating power connectors on the rear of the HDD cage.
8. Connect one end of the SAS cable to the SAS control connector on the rear of the HDD cage and the other end to the SAS control connector (SAS2).

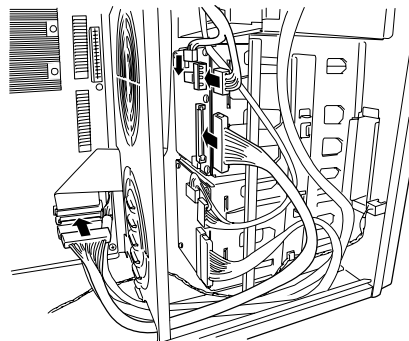


Figure 56: Connecting the cables

9. Connect the LED cascade cable as shown in the figure below. Connect the LED cable that has been connected with the factory-installed HDD cage to the connector on the additional HDD cage.

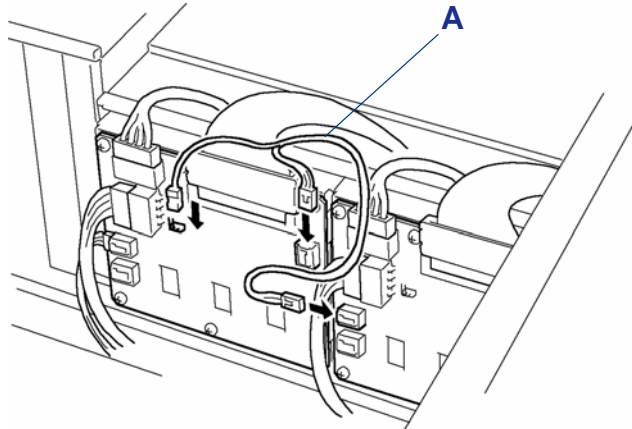


Figure 57: Connecting the LED cascade cable

A: LED cascade cable

10. Connect the interface cable.
 - SAS1 connector: The SAS1 connector is connected to the normally installed HDD cage (ID0 to ID3).
 - SAS2 connector: The SAS2 connector is intended to be connected to an additional HDD cage.

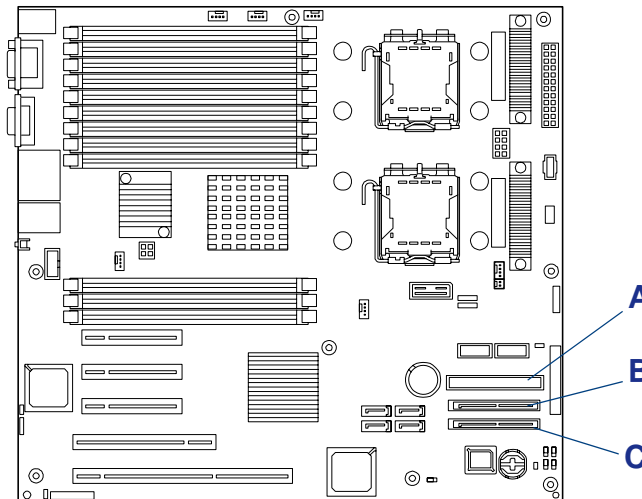


Figure 58: IDE and SAS connectors

A: IDE connector
B: SAS2 connector
C: SAS1 connector

11. Fix the HDD cage to the server with the four fixing screws removed in step 5.

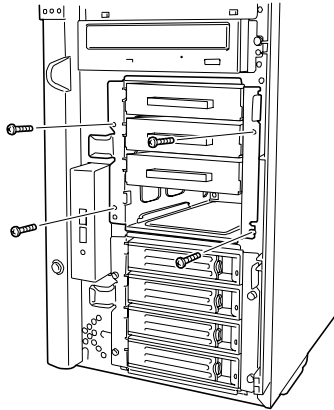



Figure 59: Fixing the HDD cage

12. Install the components removed earlier.

Removal

Remove the HDD cage in the reverse procedure of the installation.

Installing and Replacing a Power Supply Unit

 *Note: The following procedures apply only to the hot-swap power supply model.*

Your hot-swap power supply model contains one or two power supplies. The second power supply is optional and provides a redundant configuration that ensures continued operation of the system in the unlikely event one of the power supplies fails.

Installing a Power Supply Unit

1. Read section [“Preparing Your System for Upgrade” on page 110](#).

Caution

Turn off the power. Failure to do so causes the server to malfunction or fail.

2. Remove the screw securing the blank cover and remove the cover from the chassis.

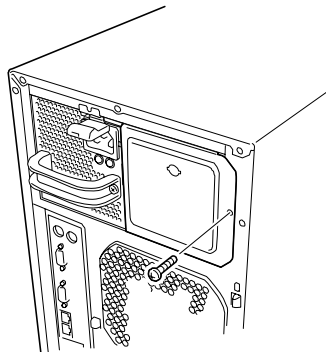


Figure 60: Removing the Blank Cover

- Slide the power supply into the vacant slot until it locks.

⚠ Caution

To avoid damaging the power supply unit, do not tilt or twist the unit as you push it into the connector.

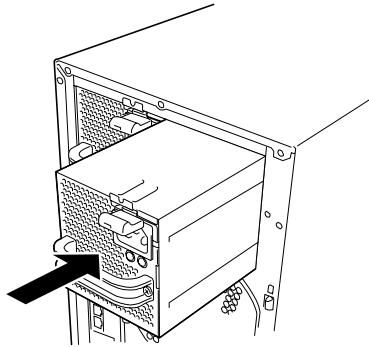


Figure 61: Installing a Power Supply Unit

- Connect two power cords to the AC inlets. Use the standard power cord coming with the server and the cord coming with the power supply. The Power lamp (green) blinks when the power cords are connected.

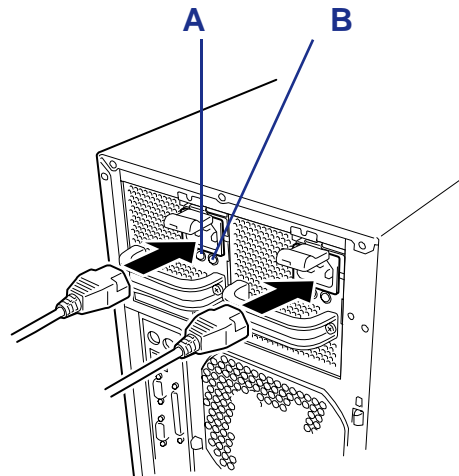


Figure 62: Connecting the Power Cords

A: Power lamp
B: Power failure lamp


If the lamp does not go on, check that power is supplied to the unit. If the lamp remains off or the POWER FAIL lamp goes on amber, the power cord or the power supply unit may be defective or the power supply bay containing the power supply unit may be failed. Contact your service representative to ask for maintenance.

- Turn on the power of the server.
The power lamps on the power supplies go on.
- Make sure that no error on the power supply are reported with the status lamp and POST.

See [“POST Error Messages ” on page 210](#) for details about the error messages.

When the power lamp of the power supply is off, reinstall the power supply.

If the power lamp is still off, contact your service representative.


 *Note: When the optional power supply unit is installed but the power cord is connected to either of the power supply unit, the POWER FAIL lamp on the other unit goes on amber.*

Replacing a Failing Power Supply Unit

Replace only a failing power supply unit.

Caution

Do not remove a power supply unit operating normally.

 *Note: When the server (or disk expansion unit) is equipped with two power supplies and one of the power supplies operates normally (with the power lamp of the power supply being on), the other failing power supply can be replaced under the system operation (or in the power-on status). In this case, skip step 2 in the procedure below.*

1. Check the Power Fail lamp (amber) of the power supply units on the rear of the server to determine which module requires replacement.
2. Shutdown the server and power off the server.
3. Disconnect the power cord from the failing power supply unit.
4. While pressing down on the locking tab (1), hold the handle and carefully pull the power supply out of the power supply bay (2).

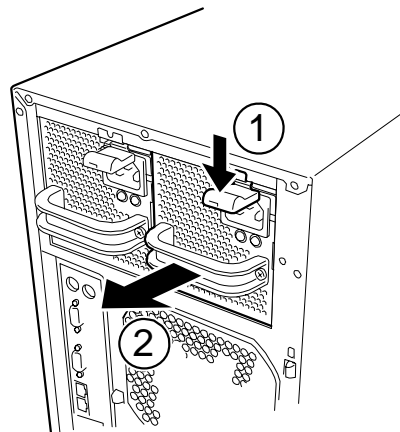


Figure 63: Removing the Power Supply from the Chassis

Caution

To avoid damaging the power supply unit, do not tilt or twist the unit as you pull it from the power supply bay. The initial resistance you will feel is caused by the module disengaging from its connector. Use even, steady force to remove the unit.

5. When operating the server without installing a replacement power supply unit, install the blank cover you removed in step 2 of power supply unit installation procedure.

 **Caution**

To maintain the cooling effect in the server, install the blank cover in the vacant slot of the power supply bay.

6. Install the new power supply unit. [*See “Installing a Power Supply Unit” on page 131.*](#)
7. Check that the power supply unit is installed correctly.

Installing and Removing a Cooling Fan Unit

Your server can include up to three cooling fans for cooling the CPU, memory and PCI devices (up to two cooling fans when the water-cooling kit is installed).

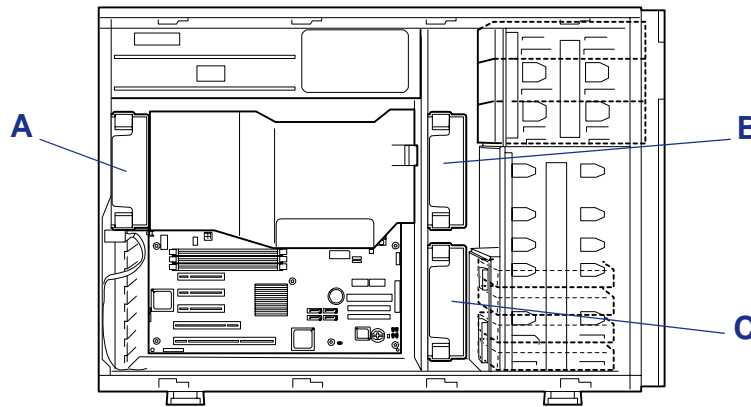


Figure 64: Cooling System

- A: Rear fan
- B: Front fan
- C: Option fan

Installing a Cooling Fan Unit

1. Read [“Preparing Your System for Upgrade” on page 110](#)
2. Remove the right side door.
3. Insert the cooling fan unit into the chassis.

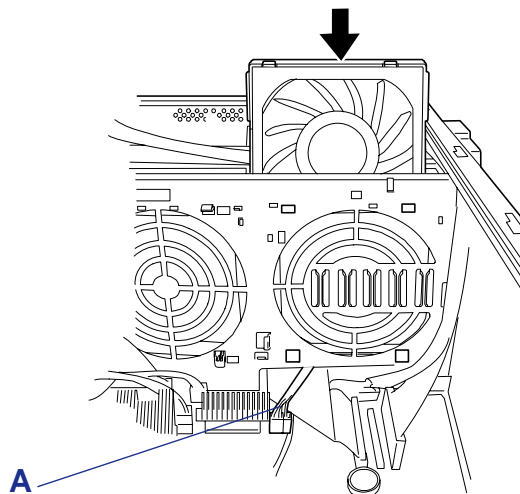

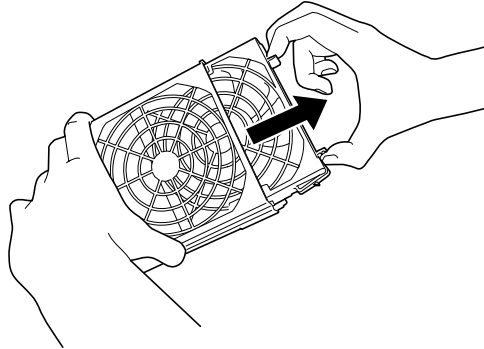


Figure 65: Inserting a Cooling Fan Unit

- A: Fan cable

 Notes:

- Pass the cooling fan cables to the mother board connector (see the figure).
- For easy installation, remove the hot-swap fan from the cooling fan unit during installation.



4. Insert the tabs (A) into the holes on the frame of the server and push the cooling fan unit toward the frame.
The cooling fan unit is locked with locking tabs (B).

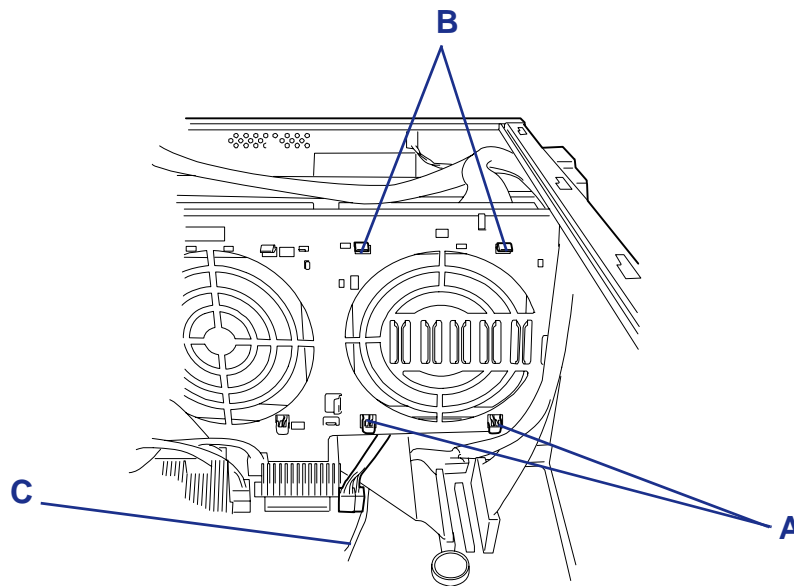


Figure 66: Locking the Cooling Fan

- A: Tabs
- B: Locking tabs
- C: Fan cable

5. Connect the cooling fan cable (C) to the motherboard.

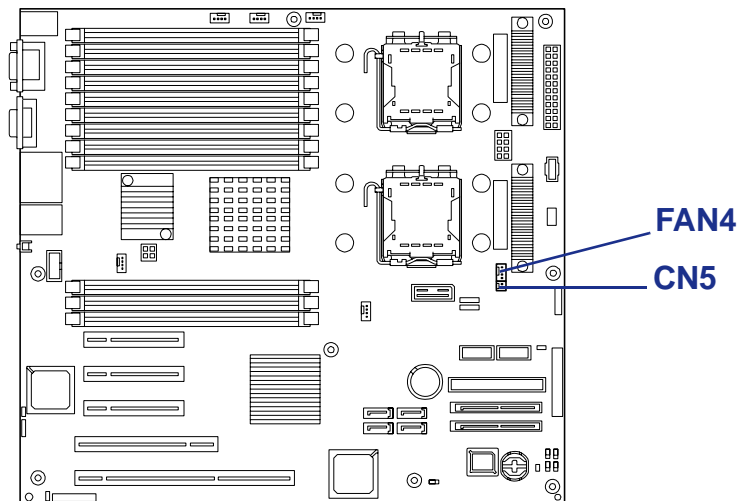


Figure 67: Cooling Fan Connectors

 *Note: Take care to connect the cable to the proper connector. Otherwise, NEC ESMPRO will fail to monitor the server.*

6. Reassemble the removed components.

Removing a Cooling Fan Unit

1. Read [“Preparing Your System for Upgrade” on page 110](#)
2. Remove the right side door.
3. Remove the connectors of the fan unit from the mother board.
4. Push the locking tabs (A) to unlock the cooling fan unit, and remove the fan unit from the server.

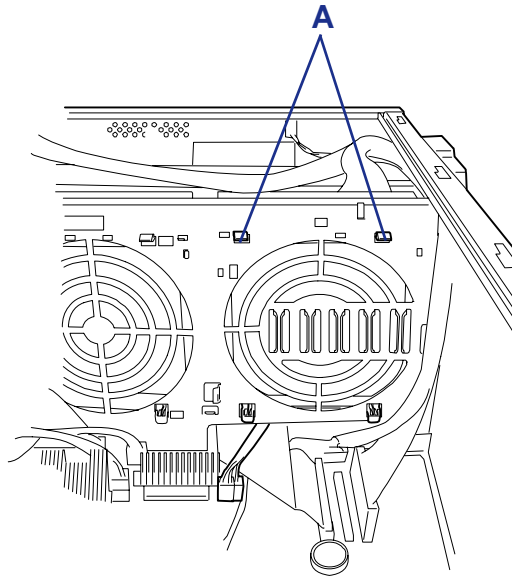

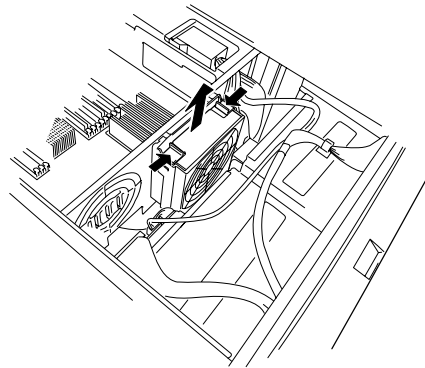


Figure 68: Locking the Cooling Fan

A: Locking tabs

 **Note:** For easy removal, remove the hot-swap fan from the cooling fan unit during removal.



5. Reassemble the removed components.

Removing and Installing a Hot-Swap Fan

Your server includes two standard hot-swap fans and one optional hot-swap fan.

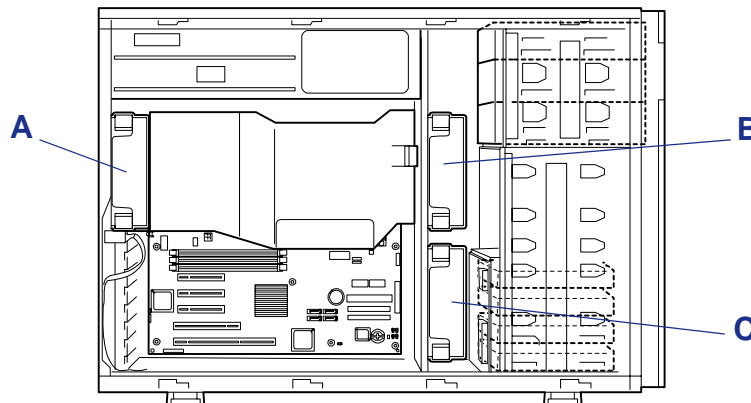


Figure 69: Cooling System

- A: Rear fan
- B: Front fan
- C: Option fan

Caution

- Remove only defective fans.
 - You have five minutes to replace the defective fan you removed.
-

Checking a Fan Status

When a fan is failing, you can observe the fan failure in the following manner:

- POST error code
- Alert message via NEC ESMPRO application
- System event logged by the optional remote management card

Replacing a Hot-Swap Fan

1. Read [“Preparing Your System for Upgrade” on page 110](#)

2. Remove the right side door.
3. While pressing release tabs on the top of the fan, pull the fan out of the cooling fan unit.

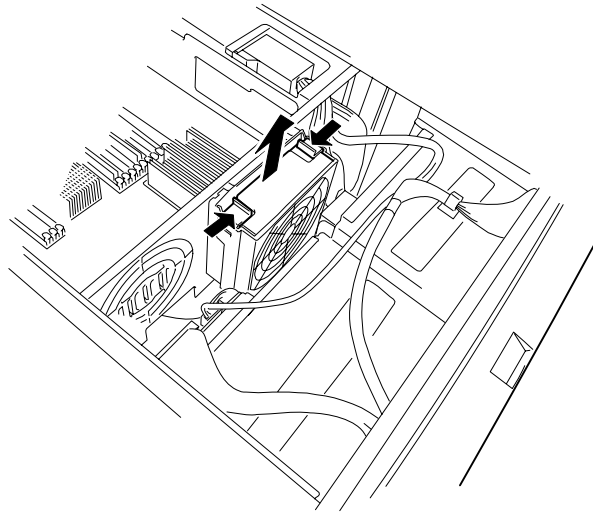


Figure 70: Removing a Hot-Swap Fan

4. Insert the new hot-swap fan into the fan unit until it clicks into place.

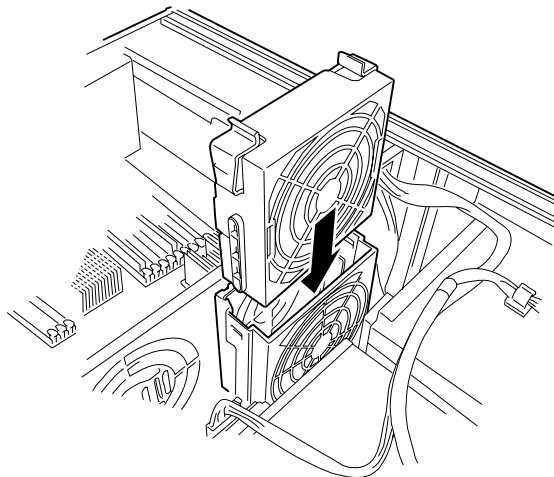


Figure 71: Inserting a Hot-Swap Fan

5. Install the right side door.

Installing and Removing 5.25-inch Devices

The server contains three slots in which backup devices including DVD-ROM and magnetic tape drives can be installed. The DVD-ROM drive is factory installed in bottom slot. To install a backup device, you must also installed a SCSI controller.

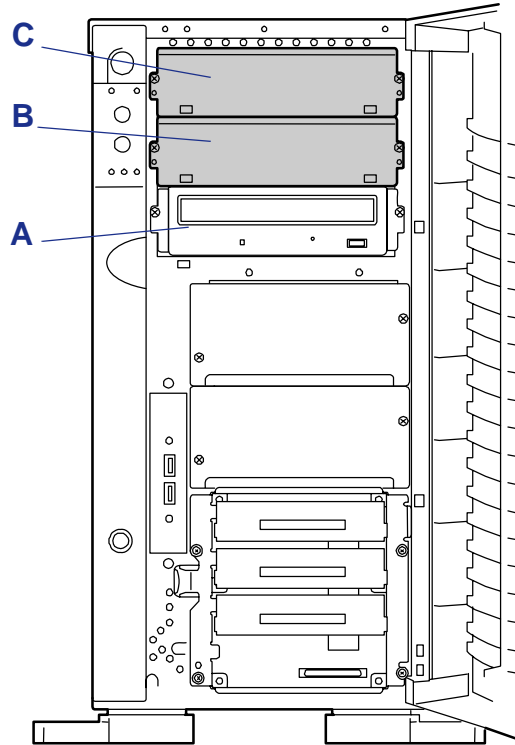



Figure 72: 5.25-inch Device Slots

A: Slot 1
B: Slot 2
C: Slot 3

 Notes:

- The server can include a maximum of two devices: two single-height devices, or one double-height device.
 - Set the SCSI termination of the 5.25-inch device to OFF and the SCSI ID to a value which is not assigned to any other device. Refer to the vendor documentation that comes with the device on how to set the values.
 - For single-height device, first install a device in slot 1. Then install another device in slot 2.
For double-height device, install the device in the slots 2 and 3.
 - To install an internal DVD-RAM, set the operation mode to "SLAVE".
-

Installing a 5.25-Inch Media Device

1. Observe the safety and ESD precautions listed under [“Upgrading Your System” on page 109](#) and [“Static Precautions” on page 109](#).
2. Prepare your system for upgrade. See [“Preparing Your System for Upgrade” on page 110](#).
3. Remove the right side door. See [“Removing the Right Side Door” on page 111](#).
4. Remove the dummy cover from the bay where you are installing a media device. The dummy cover is released by removing the two screws holding it in place.

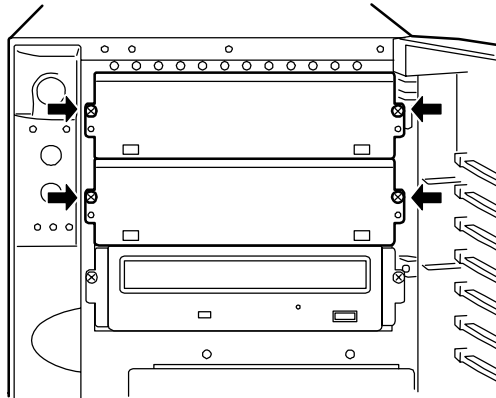



Figure 73: Removing the Dummy Cover

 Note: When installing a full-height device, remove two dummy covers.

5. Remove the device from its protective wrapper and place it on an antistatic surface. Record the drive model and serial number in the equipment log.
6. Set any drive jumpers or switches before you install the drive. See the documentation that comes with the device for jumper or switch information.
7. Attach the mounting rails to the device with the four screws that come with the device.

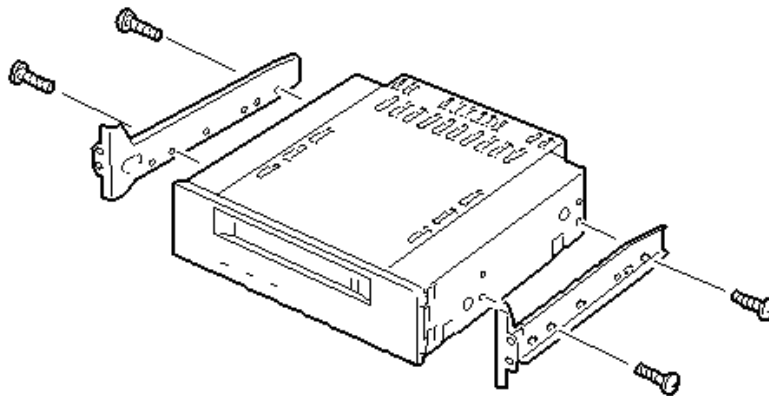



Figure 74: Attaching the Device Mounting Rails

 Notes:

- If the drive comes with drive rails, do not use them. Remove any rails already attached.
 - When installing a double-height device, use the DLT device rails (larger L-shaped rails) that come with the server.
-

 **Caution**

When installing mounting rails on a removable device always use the screws that come with the device. Using longer screws or those of different diameter may cause damage to the device.

8. Disconnect the front cooling fan cable from the motherboard.
9. Press the locking tabs to unlock the fan unit, and remove the front cooling fan unit from the chassis.

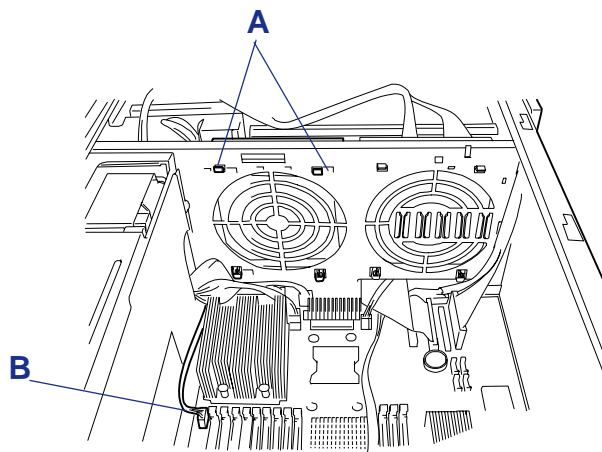



Figure 75: Removing the Cooling Fan Unit

10. Push the 5.25-inch device into the device bay carefully.

 **Note:** Make sure that the cables are not caught while the 5.25-inch device is pushed into the slot.

 **Caution**

If a 5.25-inch device occupying two slots cannot be inserted easily, push the device to the slots with it lifted a little.

11. Check whether the installed 5.25-inch device is projected too much from the front of the server.

Check the device installed in a 5.25-inch device bay based on the optical disc drive normally installed.

12. Secure the device to the system with the screws removed in step 4 above.

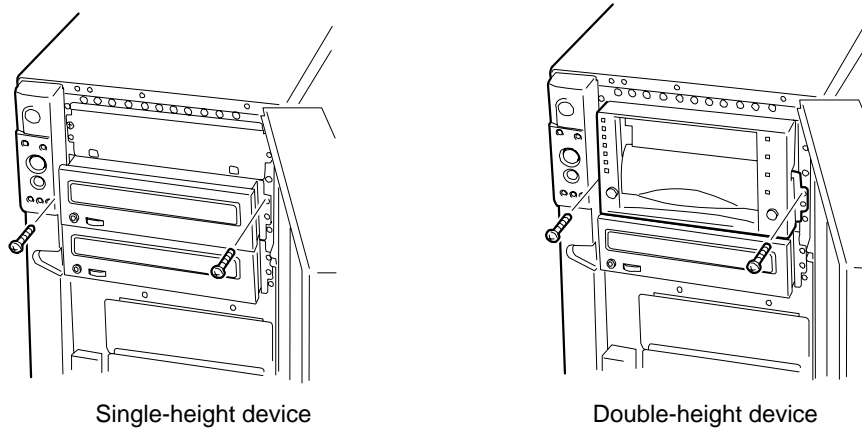
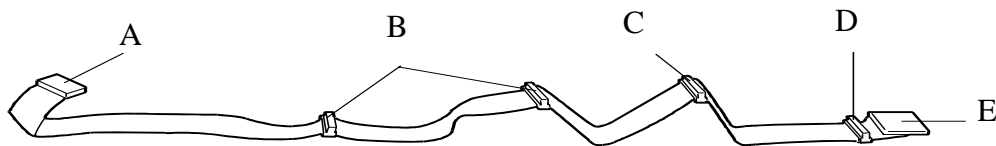


Figure 76: Securing a Removable Media Device

13. Connect the interface and power cables to the device.




- | | |
|---|--|
| A | Motherboard SCSI connector |
| B | Not used |
| C | 5.25-inch device bay SCSI connector for slot 2 |
| D | 5.25-inch device bay SCSI connector for slot 3 |
| E | Terminator |

Figure 77: SCSI Interface Cable

Caution

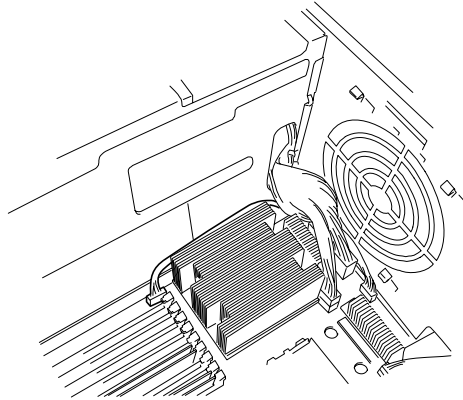
Connector pin bending or incomplete connection may cause a malfunction to occur. Provide the connection securely watching the 5.25-inch device and cable connectors.

 **Note:** Make sure that the cable is not caught.

14. Connect the power cable to the device.
15. Reinstall previously removed components.

⚠ Caution

Route the cooling fan cables to the motherboard as shown below.



-
16. Reinstall the right side door on the system chassis. See [“Installing the Right Side Door” on page 112](#).
 17. Plug in the system power cord(s), and turn on the system.
 18. Setup the SCSI BIOS for the SCSI device according to the manual that comes with the SCSI controller.
 19. Install the device driver according to the manual that comes with the device.

Removing a 5.25-Inch Media Device

1. Perform steps 1, 2, and 3 of “Installing a 5.25-Inch Media Device” described earlier in this chapter.
2. Disconnect the SCSI or IDE interface cable and voltage cable from the rear of the device you are removing.
3. Remove the two screws securing the device to the removable media device bay. See [“Securing a Removable Media Device” on page 145](#).
4. Slide the removable media device out of the device bay and set it down on an antistatic surface.

Caution

Observe static precautions. Use an antistatic wrist strap.

5. Remove the screws securing the device mounting rails to the device and set the rails and screws aside for future use. See [“Attaching the Device Mounting Rails” on page 143](#).
6. To install a replacement device, perform steps 5 through 14 of “Installing a 5.25-Inch Media Device” described earlier in this chapter. Otherwise, continue with the next step.
7. Install a dummy cover into the vacated bay (see [“Removing the Dummy Cover” on page 143](#)).
8. Reinstall the front cooling fan unit in the chassis and reconnect the front cooling fan cable connector to the motherboard.
9. Reinstall the right side door on the system chassis. See [“Installing the Right Side Door” on page 112](#).
10. Plug in the system power cord(s) and turn on the system.

Installing or Removing a PCI Board

Your server's expansion capabilities meet the needs of file and application servers for high performance I/O by providing a combination of PCI expansion slots. This section describes how to install and remove the PCI option boards.

The I/O expansion slots in your server are located on the motherboard. See [“Motherboard” on page 25](#).

The motherboard contains five slots into which PCI boards can be installed.

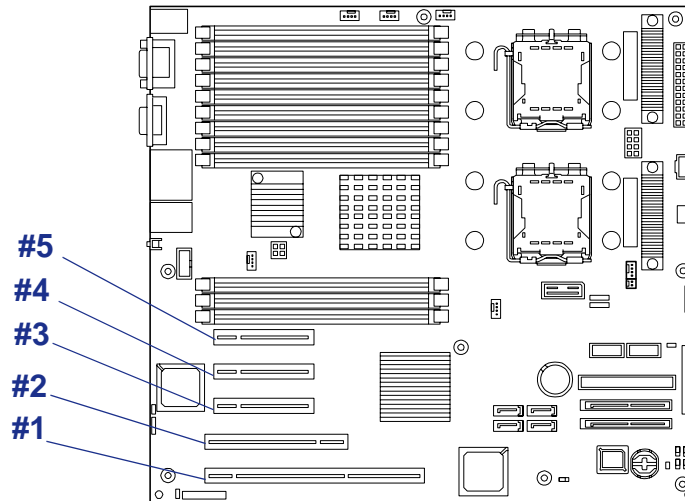


Figure 78: Motherboard PCI slots

PCI Slots #5, #4, #3: PCI Express x8

PCI Slot #2: 32-bit/33MHz

PCI Slot#1: 64-bit/100MHz


Caution

Any PCI board is easily affected by static electricity. Handle a PCI board after making your body contact with a metallic frame section of the server to discharge the static electricity on your body. Do not make bare hands contact with terminals and components on the PCI board. In addition, do not put the PCI board on a desk directly. See [“Static Precautions” on page 109](#).

Installing an Option Board

Caution

- When installing several PCI boards in PCI slots, do not route the SCSI cable between PCI boards. If the cable contacts with the IC and elements on PCI board, the PCI board or cable may be damaged.
- Depending on the board type, you may have to remove the connector cap from an adjacent slot or SCSI connector for external devices before installing the board.
- 3.3V or universal PCI board can be installed in PCI board slots #1.
- 5V or universal PCI board can be installed in PCI board slot #2.

 *Note: To install a PCI board, make sure that the board connecting section is engaged with the connector of the PCI board slot.*

Optional Devices and Installation Slots

Figure 79: Optional Devices and Installation Slots

Product Name	PCI-X #1	PCI #2	PCIe #3	PCIe #4	PCIe #5	Note
PCI Slot Capability	64bit/ 100MHz	32bit/ 32MHz	x8 lane			
Slot size	Full-height					
PCI board type	3.3V	5V	x8 socket			
Available board size	Long/short					
SCSI controller (64bit/66MHz PCI)	OK	OK	-	-	-	Cannot connect with internal hard disk drive.
SCSI controller (64bit/133MHz PCI-X)	OK	OK	-	-	-	Cannot connect with internal hard disk drive.
SCSI controller (64bit/133MHz PCI-X)	OK	OK	-	-	-	2 max. Cannot connect with internal hard disk drive. For connection with SATA disk array.
Disk array controller for onboard SAS (PCI EXPRESS x4)	-	-	OK	OK	OK	1 max. 3 max with: - Disk array controller for external SAS (PCI EXPRESS x4) - Disk array controller (1ch) (64bit/66MHz PCI) - Disk array controller (2ch) (64bit/66MHz PCI)
Disk array controller for external SAS (PCI EXPRESS x4)	-	-	OK	OK	OK	3 max. Cannot connect with internal hard disk drive. 3 max with: - Disk array controller (1ch) (64bit/66MHz PCI) - Disk array controller (2ch) (64bit/66MHz PCI) - Disk array controller for onboard SAS (PCI EXPRESS x4)

Figure 79: Optional Devices and Installation Slots

Product Name	PCI-X #1	PCI #2	PCIe #3	PCIe #4	PCIe #5	Note
PCI Slot Capability	64bit/100MHz	32bit/32MHz	x8 lane			
Slot size	Full-height					
PCI board type	3.3V	5V	x8 socket			
Available board size	Long/short					
Disk array controller (1ch) (64bit/66MHz PCI)	OK	OK	-	-	-	Cannot connect with internal hard disk drive. 3 max with: - Disk array controller (2ch) (64bit/66MHz PCI) - Disk array controller for onboard SAS (PCI EXPRESS x4) - Disk array controller for external SAS (PCI EXPRESS x4)
Disk array controller (0ch) (64bit/66MHz PCI-X)	OK	-	-	-	-	1 max.
Disk array controller (2ch) (64bit/66MHz PCI)	OK	OK	-	-	-	Cannot connect with internal hard disk drive. 3 max with: - Disk array controller for external SAS (PCI EXPRESS x4) - Disk array controller for external SAS (PCI EXPRESS x4) - Disk array controller (1ch) (64bit/66MHz PCI)
100BASE-TX adapter (32bit/33MHz PCI)	OK	OK	-	-	-	2 max.
1000BASE-T adapter (64bit/133MHz PCI-X)	OK	OK	-	-	-	Cannot co-exist with 1000BASE-SX adapter (2ch) (64bit/133MHz PCI-X)
1000BASE-T adapter (2 ch) (64bit/133MHz PCI-X)	OK	OK	-	-	-	
1000BASE-T adapter (PCI-EXPRESS x1)	-	-	OK	OK	OK	Teaming with another 1000BASE-T adapter (PCI-EXPRESS x1) is allowed.

Figure 79: Optional Devices and Installation Slots

Product Name	PCI-X #1	PCI #2	PCIe #3	PCIe #4	PCIe #5	Note
PCI Slot Capability	64bit/100MHz	32bit/32MHz	x8 lane			
Slot size	Full-height					
PCI board type	3.3V	5V	x8 socket			
Available board size	Long/short					
1000BASE-T adapter (2ch) (PCI-EXPRESS x4)	-	-	OK	OK	OK	2 max.
1000BASE-SX adapter (2ch) (64bit/133MHz PCI-X)	OK	OK	-	-	-	1 max per PCI bus (2 max per PCI bus with AFT). Cannot co-exist with: - 1000BASE-T PCI 1ch - 1000BASE-T Adapter (2ch) PCI-X (64bit/133MHz)

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 (onboard LAN controller). But it is impossible to configure the Teaming function of the same AFT/ALB on a standard network controller and an optional LAN board.

To install a board connected to a PCI board slot:

1. Observe the safety and ESD precautions listed under [“Upgrading Your System” on page 109](#) and [“Static Precautions” on page 109](#)
2. Prepare your system for upgrade. See [“Preparing Your System for Upgrade” on page 110](#).
3. Remove the right side door. See [“Removing the Right Side Door” on page 111](#).
4. Remove the expansion slot screw.
5. Remove the expansion slot cover from the inside of the cabinet by pushing it out the rear of its expansion slot with your fingers. Save the expansion slot cover for future use.

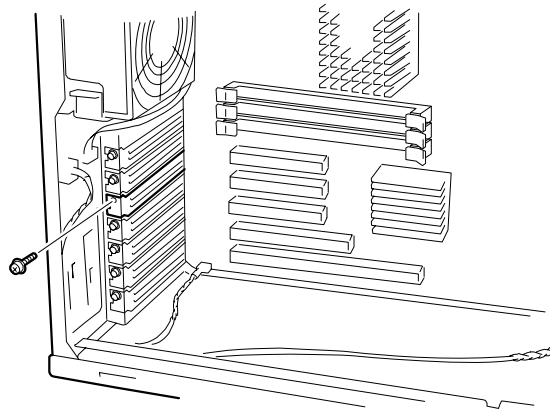


Figure 80: Removing the Expansion Slot Screw and Cover

6. Remove the option board from its protective wrapper, holding the board only by the edges. Do not touch the board components or the gold connectors.

⚠ Caution

Observe static precautions. Use an antistatic wrist strap.

7. Record the option board serial number in the equipment log.
8. Set any board jumpers or switches as described in the documentation that comes with the option board.

9. While holding the board by its top edge or upper corners and its component side facing down, firmly press the board into an expansion slot on the motherboard. The tapered foot of the option board retaining bracket must fit into the mating slot in the expansion slot.

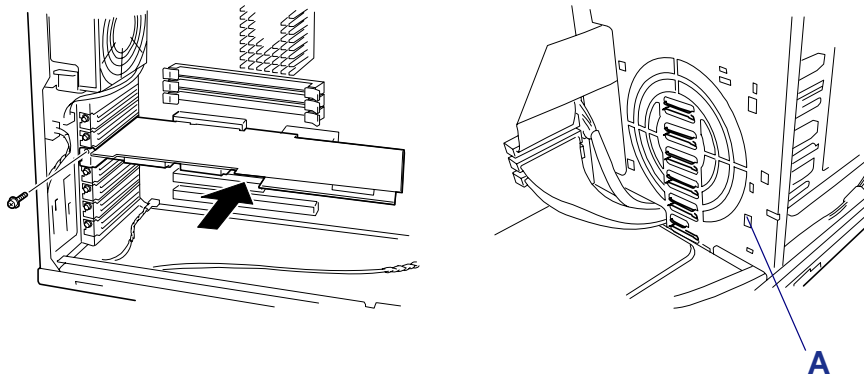



Figure 81: Installing an Option Board

A: Guide rails

 **Note:** For a long-sized board, align the right end of the board with the groove of the guide rail on the server and then connect the board to the slot.

10. Push the board fully so that the board connector is certainly connected to the slot.


Caution

If the board cannot be installed easily, remove the board once and then reinstall it. Excess force added to the board may cause the board to be broken.

11. Align the rounded notch in the retaining bracket with the threaded hole in the front expansion slot frame and the rear guide rail. The retaining bracket fits into the space that was occupied by the expansion slot cover.
12. Reinstall the setscrew in the threaded hole. Be sure to push the bracket slot up against the setscrew before you tighten it. If this is not done, the bracket may interfere with an adjacent bracket.


13. Connect any external cables (if they are needed) to the installed option board.
14. If you installed a full-length PCI board you must also align the rear edge of the PCI board with the guide slots located in the fan cover.
15. If applicable, reinstall all components removed earlier in step 4.
16. Replace the right side door and close the front door.
17. Plug in the system power cord(s), and power on the system.
18. Check that no error message appears during the POST. If an error message occurs, write down the message and review the error message listed in chapter 5.
19. Start the "BIOS Setup Utility" to set the "Reset Configuration Data" in the "Advanced" menu to "Yes".

Removing an Option Board

 **Note:** Expansion slot covers must be installed on all vacant slots to maintain the electromagnetic emissions characteristics of the system and to assure proper cooling of the system components.

1. Observe the safety and ESD precautions listed under [“Upgrading Your System” on page 109](#) and [“Static Precautions” on page 109](#).
2. Prepare your system for upgrade. See [“Preparing Your System for Upgrade” on page 110](#).
3. Remove the right side door. See [“Removing the Right Side Door” on page 111](#).
4. Disconnect any cables attached to the option board you are removing.
5. Remove and save the option board retaining bracket setscrew.
6. Hold the board at each end and carefully rock it back and forth until the edge connectors pull free. Make sure that you do not scrape the board against other components.
7. Remove the board from the expansion slot and place it in an antistatic wrapper. If you are replacing a board, go to [“Installing an Option Board” on page 150](#), otherwise continue.
8. Insert an expansion slot connector cover into the vacated slot.
9. Install an expansion slot cover over the vacant slot using the previously removed setscrew.
10. If applicable, reinstall all components removed earlier in step 4.
11. Reinstall the right side door on the system chassis. See [“Installing the Right Side Door” on page 112](#).
12. Plug in the system power cord(s), and turn on the system.

Installing or Removing a RAID Controller Board

 **Note:** The server contains onboard RAID controller. See the online document in ExpressBuilder CD-ROM for configuring RAID using the onboard RAID controller.

The RAID controller board is an optional PCI board developed to improve data reliability.

Installing the disk array controller board allows you to use hard disk drives in the device bays of the server and those in the optional additional disk unit in the disk array configuration.

The server can include one of the following optional RAID controller:

- MegaRAID SCSI 320-1
- MegaRAID SCSI 320-2
- LSILogic MegaRAID SAS 8480E
- LSILogic MegaRAID SAS 8408E

See the manual that comes with your RAID controller for details.

Table 22: Functions of a Disk Array Controller

Function	Description
Level	Support RAID levels RAID0, RAID1, RAID5, RAID10 and RAID50.
Hot swap	Allows a hard disk to be replaced while the system is running depending on RAID level and system configuration.
Auto rebuild	After the defective hard disk is replaced with a new one, the data saved in the defective hard disk is automatically recovered from the data saved in the remaining hard disks depending on RAID level.
Expand capacity	The addition of a hard disk without system interruption can automatically expand the area in which disk arrays are available, and the logical drive capacity.

Please note the following when installing and configuring a disk array:

- Disk array controller boards are easily affected by static electricity. Handle the disk array controller board only after making body contact with the metallic frame section of the server chassis in order to discharge the static electricity from your body. Also, never make contact with terminals and components on the disk array controller board using your bare hands.
- To change the disk array configuration or the RAID level, the hard disks must be initialized. If important data is saved on the hard disks used to constitute a disk array, first back up the data on the other hard disks and then install the boards and configure the disk array.
- At least two hard disk drives are required to configure a disk array.
- Hard disks used in the disk array configuration should have the same disk revolution rate and capacity.

- Up to four disk array controller boards can be installed in the server.
- Several RAID (Redundant Arrays of Independent Disks) levels can be set for the newly installed disk array controller boards. For details of the available RAID types, data transfer rate, and array configurations refer to the online documentation on the ExpressBuilder CD-ROM that comes with your system or the vendor documentation that comes with the disk array controller.
- The available capacity of the hard disks in the disk array configuration will be lower than the capacity of the hard disks in a standard configuration, but the disk reliability is much improved.
- Set "PCI Slot n ROM (n: slot number)," a parameter of the slot in which a hard disk is installed, to "Enable" in "PCI Configuration" on the Advanced menu of the BIOS utility SETUP.
- Replacement of disk array controller board

Restore the disk array configuration information in the disk array controller boards. Use the configuration utility for the restoration. Refer to the online document stored in the ExpressBuilder CD-ROM coming with the server or the documentation coming with the disk array controller for details. If a disk array controller is replaced, create the configuration information by using the proper utility.

- When more than one disk array controller board are installed in the server, install the disk array controller board to which the system disk to be booted is connected in the lowest PCI slot number.
For example, if four disk array controller boards are installed in PCI slots #2, #3, and #6, the system disk should be connected to the board installed in PCI slot #1.

Table 23: Boot priority

Slot No.	Boot priority
#5	3
#4	4
#3	1
#2	5
#1	2

Using Internal Disks in Disk Array Configuration


For the installation of the RAID controller board, see [“Installing or Removing a PCI Board” on page 149](#) and the manual that comes with the RAID controller board. You can also refer to the Online Documentation of the ExpressBuilder CD-ROM.

Use the interface cable coming with the RAID controller board. Disconnect the cable from the server and keep it for future use. After the installation, provide the setting such as RAID level for the RAID controller board by using the disk array BIOS utility of the board.

Refer to the manual that comes with the RAID controller board for details.

Disk Array Configuration of Additional Disk Unit

The additional disk unit is exclusively used for installation of hard disks. The cabinet can contain up to 14 hard disks. The server equipped with disk array controller boards can be connected with up to four additional disk units.

 Notes:

- *The additional disk unit does not contain hard disk drives. Purchase the drives additionally.*
 - *To connect with additional disk unit, use the server of rack-mount type or use the additional disk unit of tower type (pedestal type). You will need an optional conversion kit.*
-

After the connection of the additional disk unit to the server, provide the disk array configuration for the additional disk unit by using the Disk Array Configuration. See the manual that comes with the disk array controller for details.

Installing and Removing a Microprocessor

The motherboard includes two processor sockets. The primary and secondary processor sockets are located as shown in the figure below.

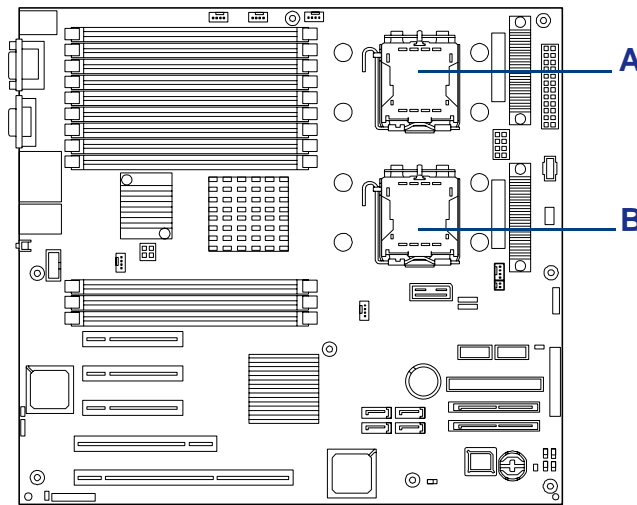



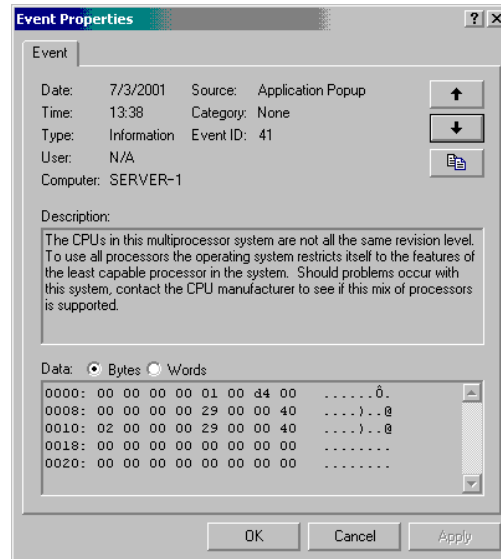
Figure 82: Processor Sockets

A: Processor 1
B: Processor 2

Caution


CPUs are easily affected by static electricity. Handle a CPU after making your body contact with a metallic frame section of the server to discharge the static electricity on your body. Do not make bare hands contact with the CPU pins. In addition, do not put any CPU on a desk directly. See [“Static Precautions” on page 109](#).

 *Note: If the different revision of the processor is installed in the multiprocessor system, Windows logs the following information every startup. If this message is logged, it is no problem for operation.*



Installing a Microprocessor

1. Read section [“Preparing Your System for Upgrade” on page 110.](#)
2. Open the server front door.
3. Shutdown the operating system (OS).
4. Press the power on/off switch on the front panel of the server.
The power-on LED goes out.
5. Power off the peripheral devices.
6. Unplug the system power cord(s) from the AC wall outlet(s).

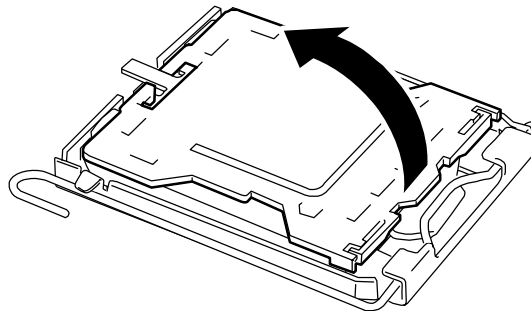
 *Note: If the system power cord is connected to a power control unit such as an UPS (Uninterruptible Power Supply), refer to the UPS user's guide for proper power-off procedures.*

7. Remove the right side door of the chassis. See [“Removing the Right Side Door” on page 111.](#)

⚠ Caution

For proper cooling and airflow, do not operate the system with the right side door removed. Always replace the panel before powering on the system.

8. Remove the processor air duct. See [“Removing the Processor Duct Cover” on page 114.](#)
9. Locate the CPU socket which you are going to install CPU.
10. Remove the CPU cover.



11. Raise the locking lever on the socket.

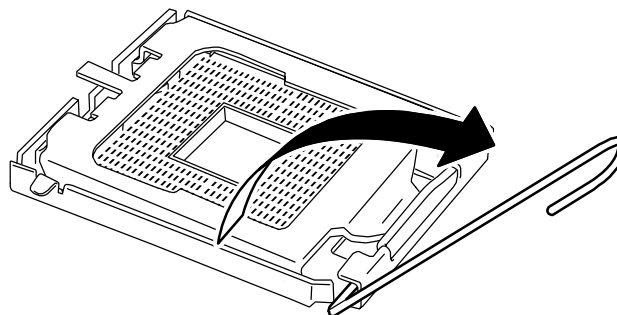
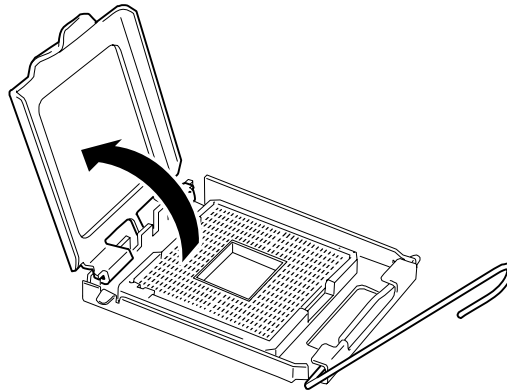


Figure 83: Opening the CPU Socket Locking Lever

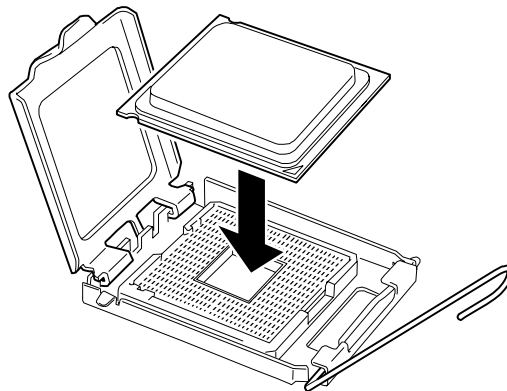
⚠ Caution

Open the lever until it stops. The bar can be opened to approximately 120 degrees.

12. Raise the CPU socket holder.



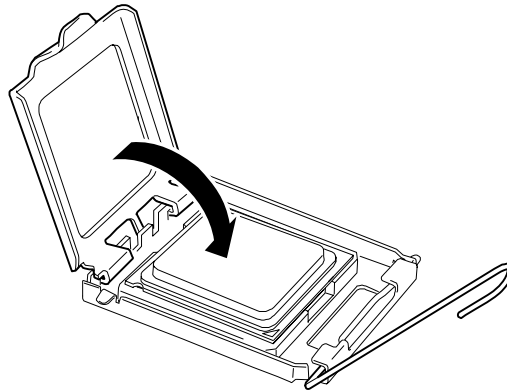
13. Put the CPU on the socket slowly and carefully.



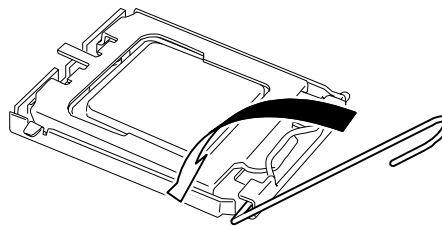
 **Caution**

Make sure of the orientation of CPU. A pin mark is placed on CPU and CPU socket to prevent an incorrect insertion. Check the pin marks on CPU and socket before inserting CPU into socket.

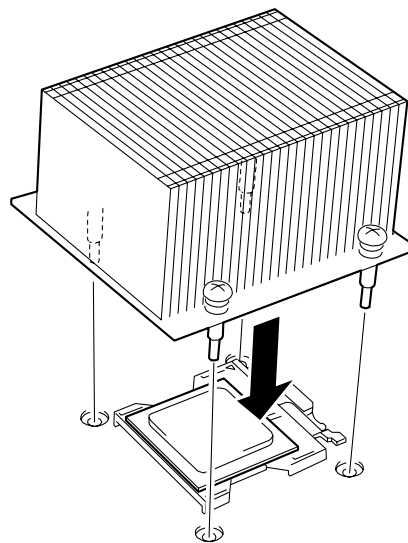
14. Push the CPU lightly to the socket, and push down the CPU socket holder.




15. Push down the lever to secure the CPU.

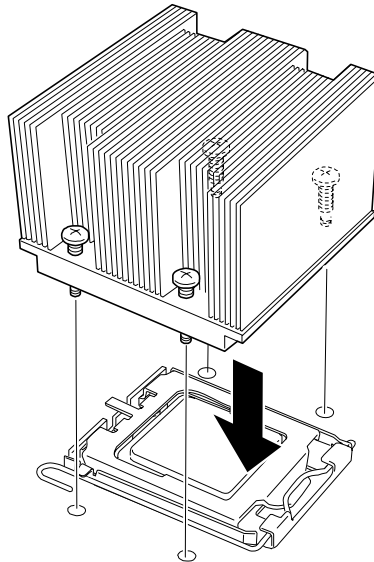



16. Put the heat sink on CPU.

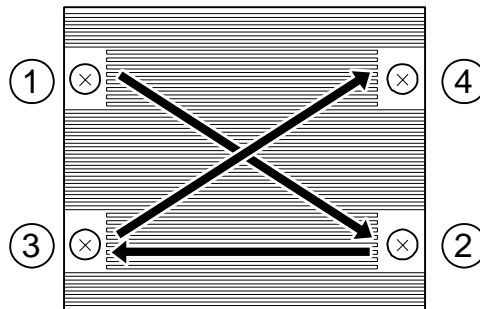


17. Secure four screws to fix the heat sink.

 *Note: Tighten If you are going to use the water cooling kit instead of heat sink, see "Water Cooling Kit" described later.*

**18. Fix the heat sink with four screws.**

 *Note: Temporarily secure the four screws in the order as shown in the figure below. Then, secure them tightly.*

**19. Make sure that the heat sink is level with the motherboard.**

 *Notes:*

- *If the heat sink is not level, remove it, and then install it again. The following probably causes the heat sink not to be level:*
 - *The CPU is not positioned correctly.*
 - *The heat sink is not completely secured with screws.*

-
- Do not move the secured heat sink.
-

20. Install the components you removed previously.
21. Set [Reset Configuration Data] on the Advanced menu to "Yes".
This setting is required to change the hardware configuration data.
22. If the CPUs are additionally installed to configure a multi-processor system, provide the following settings on Windows.
Select [Device Manager] - [Computer] and check the driver. If the driver is "ACPI single processor PC", change it to "ACPI multi-processor PC". Restart the server according to the on-screen message, and update the system.

Removing a Microprocessor

To remove the CPU, prepare the removal referring to steps 1 and 9 in the installation procedure and do the reverse procedure of steps 19 to 10. Slightly move sideways the heat sink before removing it.

Caution

- Do not remove any CPU unless it is failed.
 - After the operation, heat may make the cool seat at the bottom of the heat sink adhere to the CPU. To remove the heat sink from the CPU, first turn the heat sink to the left and right lightly to make sure that the heat sink can be apart from the CPU. Removing the heat sink with it adhering to the CPU may cause the CPU and/or socket to be defective.
-

Do the following procedure if a CPU is removed (or replaced):

1. Start SETUP to select menus "Main" - "Processor Settings" - "Processor Retest" in the order to clear the error information on the removed CPU.
When a CPU is replaced, select menus "Main" - "Processor Settings" to confirm that the ID and L2 Cache of the additional CPU are defined normally.
2. Set "Reset Configuration Data" on the Advanced menu to "Yes."
This is required to update the hardware configuration information.

Installation (Water Cooling Kit)

Install the water cooling kit on the CPU in the following procedure.

1. Peel off the tape and remove the protector on the bottom. Also remove the protector on the side.

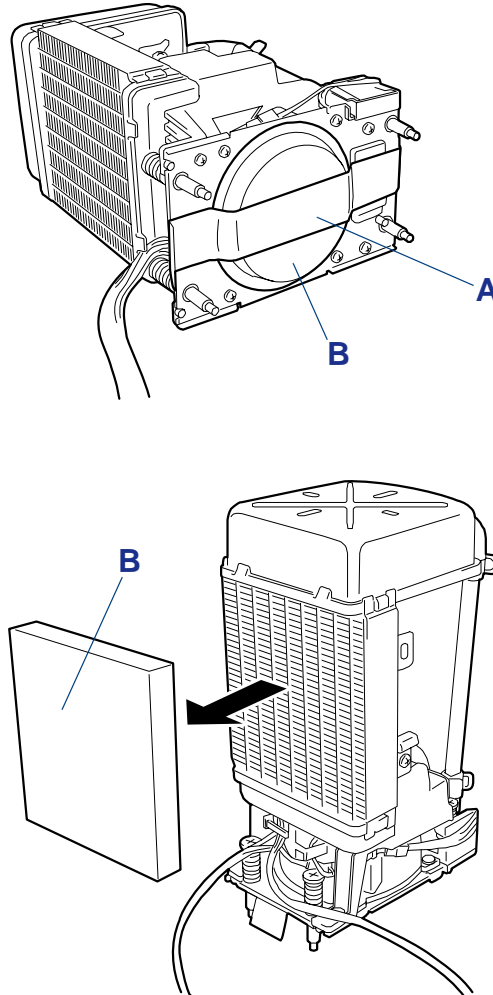


Figure 84: Removing the Protectors

A: Tape
B: Protector

- Put the water cooling kit on the CPU.

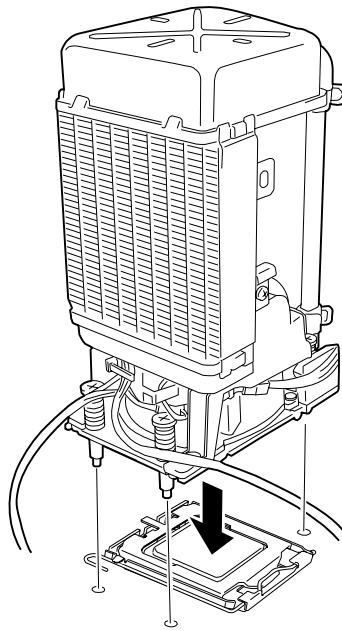


Figure 85: Putting the water-cooling kit on the CPU

- Fix the water cooling kit with screws.
For how to fix the water cooling kit, see step 11 of the CPU installation procedure.

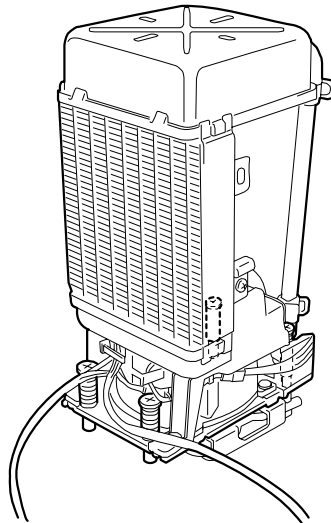


Figure 86: Fixing the water-cooling kit

4. Connect cables.

Check the connectors to which cables are to be connected for proper connections. Set the water-cooled heat sink exchange jumper switch (CN6) as shown in the figure below.

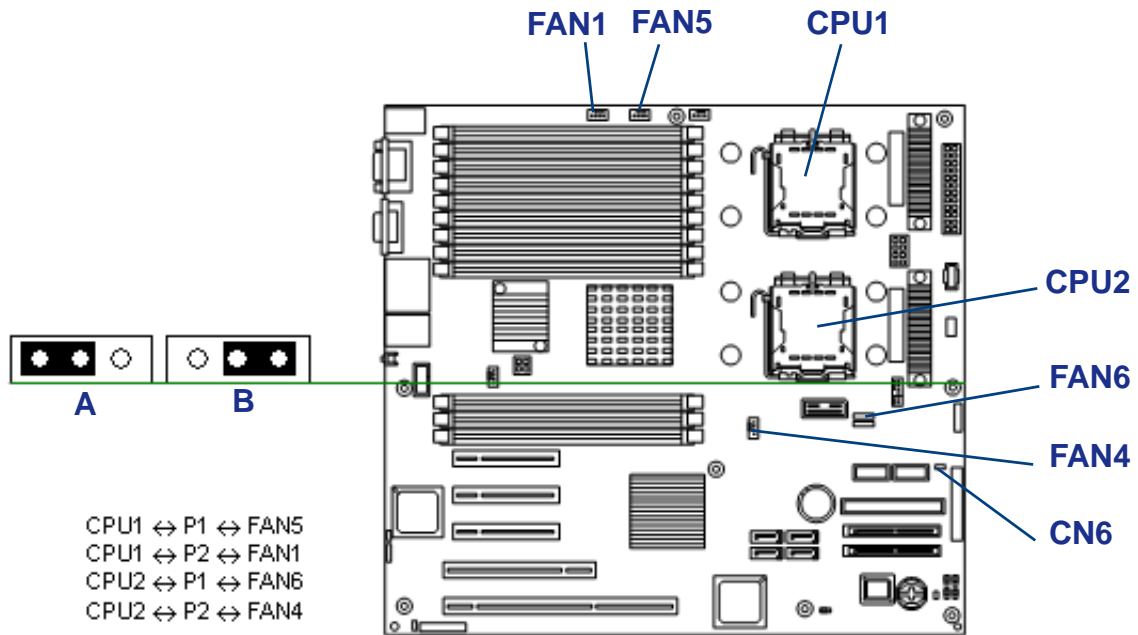


Figure 87: Cable Connection

A: Standard Heat Sink Jumper Setting
 B: Water-cooled heat Sink Jumper Setting

Failure to connect the cables properly or set the jumper switch correctly may cause the liquid leak and pump rotation of the water-cooled heat sink to be monitored incorrectly.

Removal (Water Cooling Kit)

Remove the water cooling kit from the CPU in the reverse procedure of the installation.

Caution

If you have installed or removed the water-cooling heat sink kit, you must update the system.

Use the "Update CD-ROM" provided with N8101-339 water-cooling heat sink to update the system.

Updating system is required in the following cases:

- When the standard heat sink is replaced with water-cooling heat sink
 - When the water-cooling heat sink is replaced with standard heat sink
 - When 1-CPU configuration with water-cooling heat sink is changed to 2-CPU configuration with water-cooling heat sink
 - When 2-CPU configuration with water-cooling heat sink is changed to 1-CPU configuration with water-cooling heat sink
-

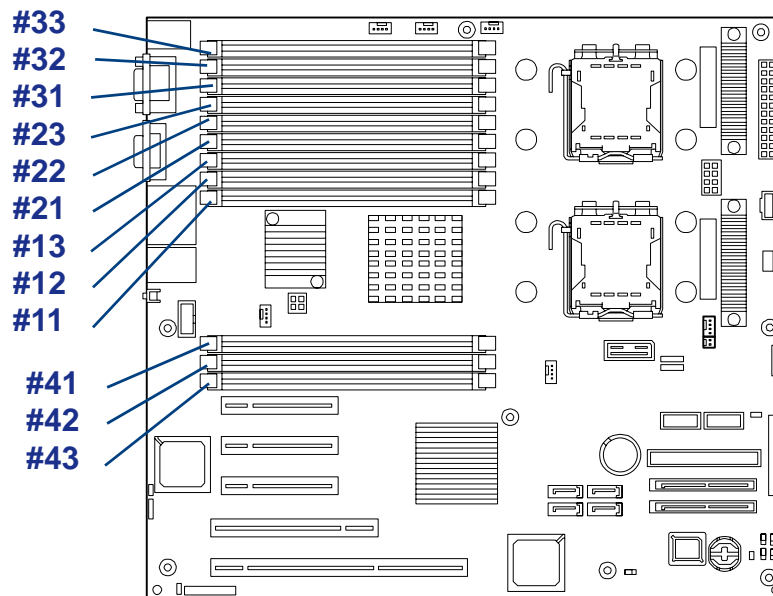
Installing or Removing DIMM

DIMM

The DIMM (Dual Inline Memory Module) is installed in a DIMM socket on the motherboard installed in the server.

The motherboard contains six pair of sockets in which DIMMs are installed. At least two DIMMs are installed in DIMMs #11 and #21. (The DIMMs normally installed may be replaced.)

DIMMs are installed on the sockets in the ascending order of DIMM socket numbers in the unit of two modules DIMMs.



Caution

- The DIMM is easily affected by static electricity. Handle the DIMM after making your body contact with a metallic frame section of the server to discharge the static electricity on your body. Do not make bare hands contact with terminals and components on the DIMM. In addition, do not put the DIMM on a desk directly. See "Static Precautions" for details of the static electricity.
- Do not use any DIMM not approved by the manufacturer. If an unapproved third party's DIMM is installed in the server, not only the DIMM but also the server itself may be defective. You will be charged by any repair of a malfunction or defect caused by such a device within the warranty period.

- Due to an interleave device, add two DIMMs in group. The server does not operate if DIMMs of different specifications are installed in a group.

Table 24: Memory Groups

Group number	Socket number in group
Group #1	DIMM#11 and DIMM#21
Group #2	DIMM#31 and DIMM#41
Group #3	DIMM#12 and DIMM#22
Group #4	DIMM#32 and DIMM#42
Group #5	DIMM#13 and DIMM#23
Group #6	DIMM#33 and DIMM#43

 **Note:**

- Up to 48GB (4GB × 12) of memory can be added.
 - In the error messages and logs in POST, NEC ESM PRO Manager, or Off-line Maintenance Utility, the DIMM connector may be called group. The number next to a group meets the connector number in the figure shown in the previous page.
-

Installing DIMM

Install a DIMM proceeding as follows.

1. See [See “Preparing Your System for Upgrade” on page 110.](#)
2. Remove the side cover. [See “Removing the Right Side Door” on page 111.](#)
3. Remove the CPU duct cover. [See “Removing the Processor Duct Cover” on page 114.](#)
4. Locate the socket in which you wish to install a DIMM.
5. Open the levers at both ends of the socket.

Caution

Do not apply an excessive pressure on the lever.

6. Push the DIMM straight into the socket.

Caution

Use extreme care when installing a DIMM. Applying too much pressure can damage the socket. Keyed DIMMs insert only one way.

If the DIMM is inserted into the DIMM socket, the lever is automatically closed.

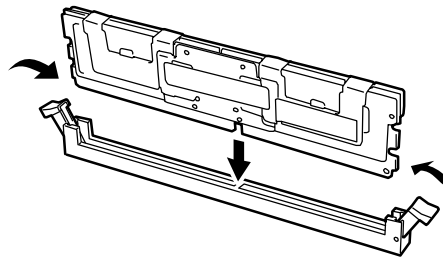


Figure 88: Inserting the DIMM

Caution

Install one pair of DIMMs at a time. In addition, use a set of memory devices with the same specification. The specification of a memory device is described on the label put on the device.

7. Gently push the levers to the upright position until they engage the notches in the DIMM
8. Install the remove components.
9. Turn on the power of the server. Then make sure that any error message does not appear in POST.
If an error message appears, write down the message and review the error message list.
10. Start SETUP to select "Advanced" → "Memory Configuration" on menus. Then make sure that the status of the additional DIMM is set to "Normal".
11. Set "Reset Configuration Data" on the Advanced menu to "Yes". This is required to update the hardware configuration.
12. When the Windows operating system is used, set the paging file size to the recommended value or larger. Installed memory capacity × 1.5.

Removing DIMM

Remove DIMM proceeding as follows.

Caution

- To remove the defective DIMM, check the error message appearing in POST or NEC ESM PRO to identify the DIMM socket (group) in which the defective DIMM is installed.
 - The server operates only when at least two DIMMs are installed.
-

1. See [See “Preparing Your System for Upgrade” on page 110.](#)
2. Remove the side cover. [See “Removing the Right Side Door” on page 111.](#)
3. Remove the CPU duct cover. [See “Removing the Processor Duct Cover” on page 114.](#)
4. Expand the levers at the both ends of the socket for the DIMM to be removed leftward or rightward. The lock is released to allow the DIMM to be removed.

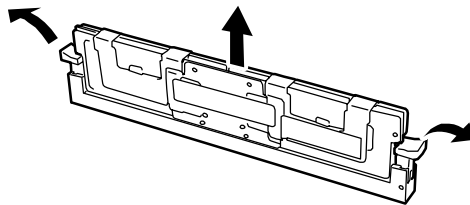


Figure 89: Removing DIMM

5. Turn on the power of the server. Then make sure that any error message does not appear in POST. If an error message appears, write down the message and review the error message list.
6. Start the SETUP to select "Advanced" → "Memory Configuration" → "Memory Retest" on the menus to clear the error information on the removed DIMM.
7. Set "Reset Configuration Data" on the "Advanced" menu to "Yes." This is required to update the hardware configuration information.

Using the Memory RAS Features

The server has the memory mirroring and online spare memory features as well as the chipkill ECC memory feature, which can automatically correct a memory error (multi-bit error) causing system shutdown.

Caution

The memory mirroring and online spare memory features are not available in the normal memory configuration. (The chipkill ECC memory feature can operate in any configuration.)

The memory area on the motherboard of the server is divided into two memory branches as shown in the figure below.

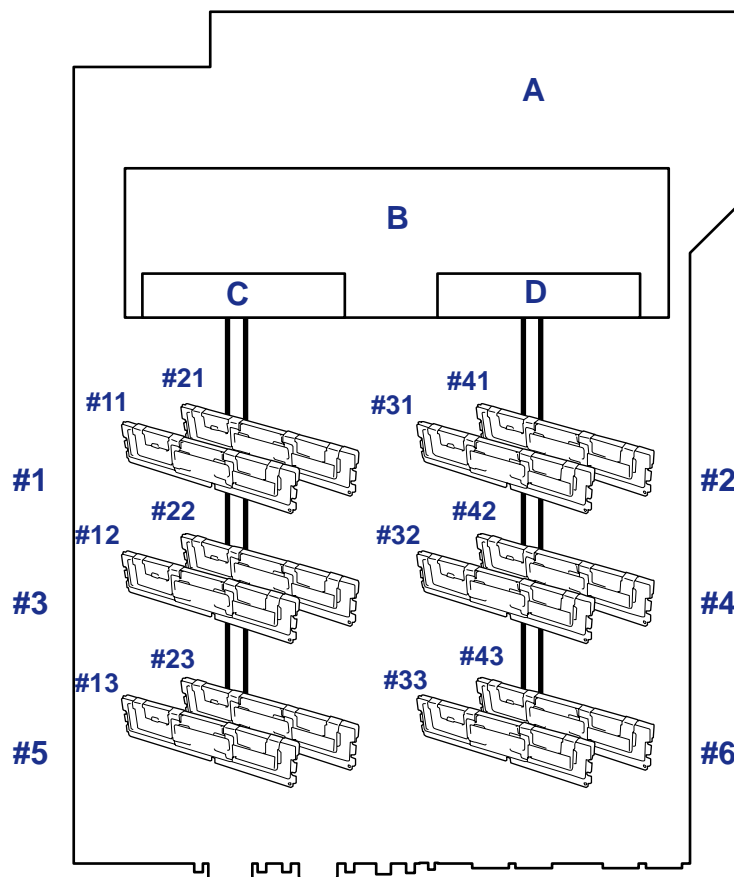


Figure 90: Memory Branches

- A: Motherboard
- B: Memory Controller
- C: Memory Branch #1
- D: Memory Branch #2

The memory mirroring and online spare memory features keep memory redundancy between memory branches and within a memory branch by monitoring or altering memory active/inactive status, respectively.

Memory Mirroring

The memory mirroring feature writes the same data into two groups of DIMMs corresponding with each other between memory branches (mirror set) to provide data redundancy.

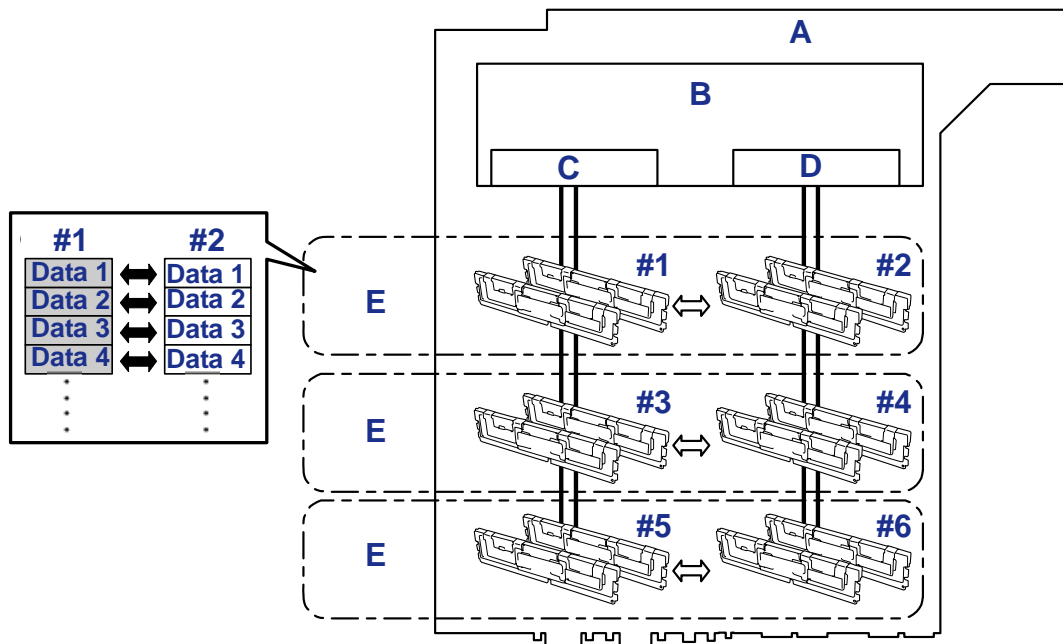



Figure 91: Memory Mirroring

A: Motherboard
 B: Memory Controller
 C: Branch #0
 D: Branch #1
 E: Mirroring Pairs

 **Note:** The operating system only recognizes half of the total physical capacity.

The memory mirroring feature can be used under the following conditions:

- Install memory modules on four memory sockets configuring a mirror set.
- All the installed memory modules should have the same capacity.
- Run SETUP, change the parameters appropriately in the [Mirror] menu selected as shown below, save the settings and exit from SETUP.

[Advanced], [Memory Configuration], [Memory RAS Feature], [Mirror]

- Install memory modules in the following order:
 Groups 1 and 2, Groups 3 and 4, Groups 5 and 6

The following mirroring cannot be configured:

- Memory mirroring between different mirror sets.

■ Memory mirroring within a specific memory branch.

The table below lists examples of DIMM installation patterns enabling the memory mirroring feature to be used.

Example	Memory Set (Group #)		Memory Set (Group #)		Memory Set (Group #)		Capacity	
	#1	#2	#3	#4	#5	#6	Physical	Logical
1	2GB	2GB	-	-	-	-	4GB	2GB
2	2GB	2GB	1GB	1GB	-	-	6GB	3GB
3	2GB	2GB	2GB	2GB	-	-	8GB	4GB
4	2GB	2GB	1GB	1GB	1GB	1GB	8GB	4GB
5	2GB	2GB	1GB	1GB	2GB	2GB	10GB	5GB
6	2GB	2GB	2GB	2GB	1GB	1GB	10GB	5GB
7	2GB	2GB	4GB	4GB	4GB	4GB	12GB	6GB
8	2GB	2GB	2GB	2GB	2GB	2GB	12GB	6GB
9	2GB	2GB	1GB	1GB	4GB	4GB	14GB	7GB
10	2GB	2GB	4GB	4GB	1GB	1GB	14GB	7GB
11	2GB	2GB	2GB	2GB	4GB	4GB	16GB	8GB
12	2GB	2GB	4GB	4GB	2GB	2GB	16GB	8GB
13	2GB	2GB	4GB	4GB	4GB	4GB	20GB	10GB
14	4GB	4GB	4GB	4GB	4GB	4GB	24GB	12GB
15	8GB	8GB	8GB	8GB	8GB	8GB	48GB	24GB

Online Spare Memory

The online memory spare feature puts a group of memory devices within a memory branch into standby status as spare devices. If an unrecoverable error occurs in a DIMM of the running group, the feature automatically changes the running DIMM from the failed one to a DIMM in the standby group to continue the processing.

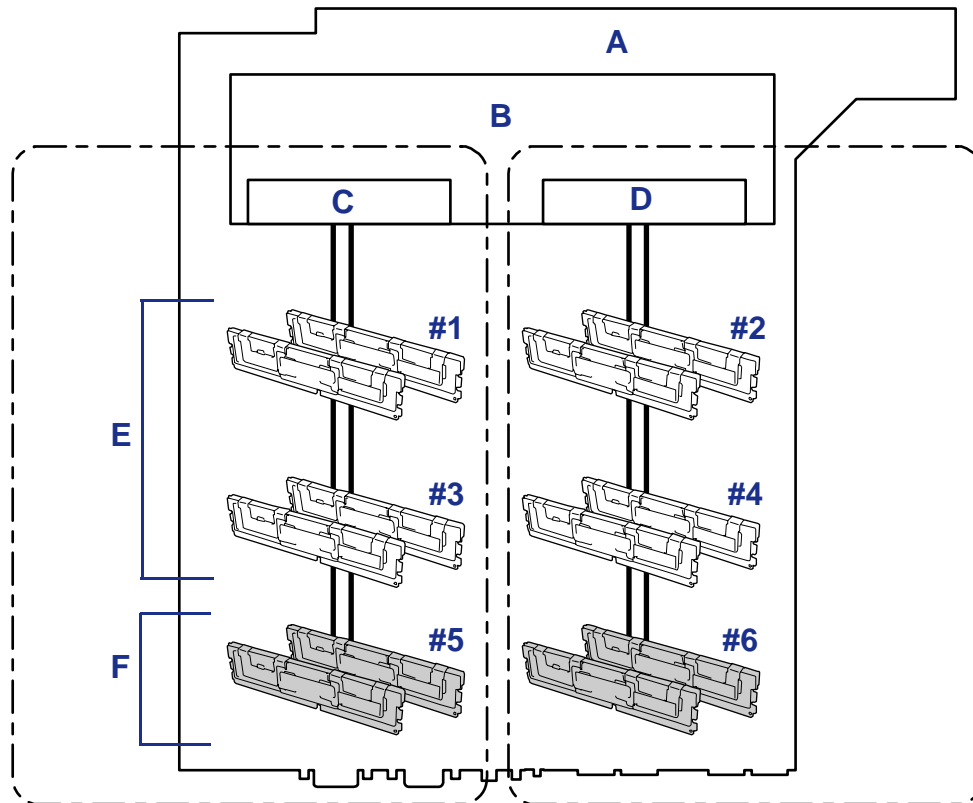


Figure 92: Online Spare Memory

- A: Motherboard
- B: Memory Controller
- C: Branch #0
- D: Branch #1
- E: In Operation
- F: Standbys

Note: The operating system recognizes the memory devices as those with capacities less than the actual physical capacities. (The recognized capacities vary depending on the number of DIMMs and the physical capacity per DIMM.)

The online spare memory feature can be used under the following conditions:

- Install memory devices to more than one group in each memory branch. The server can operate even if the memory branches are different in the number of DIMMs. For example, no error occurs if memory branches 0 and 1 include four DIMMs (or two groups) and six DIMMs (or three groups), respectively.

- DIMMs installed in a specific memory branch should have the same capacity. The server operates properly as long as DIMMs of the same capacity are installed in each memory branch. (For example, the server can operate if the total capacity of memory branch 0 is different from that of memory branch 1.)
- Run SETUP, change the parameters appropriately in the [Sparing] menu selected as shown below, save the settings and exit from SETUP.
[Advanced], [Memory Configuration], [Sparing]
- Install memory devices in the following order:
Group 1, Group 3, Group 5 for memory branch 0
Group 2, Group 4, Group 6 for memory branch 1
- The spare memory group must be the group with the largest number within a memory branch.

The following sparing can be neither configured nor set.

- Sparing to another memory branch.

The table below lists examples of DIMM installation patterns enabling the online spare memory feature to be used. While the following patterns are provided for memory branch 0, the same patterns can also be adapted to memory branch 1.

Example	Memory Branch #0 (Group #)			Capacity	
	#1	#3	#5	Physical	Logical
1	1GB	1GB	-	2GB	1GB
2	1GB	1GB	1GB	3GB	2GB
3	2GB	2GB	-	4GB	3GB
4	2GB	2GB	2GB	6GB	5GB
5	4GB	4GB	-	8GB	6GB
6	4GB	4GB	4GB	12GB	10GB
7	8GB	8GB	-	16GB	12GB
8	8GB	8GB	8GB	24GB	20GB

Depending on the specification of the memory controller, the spare memory is set in units of rank memory.

The logical memory capacity of single rank memory differs from that of dual rank memory when online spare memory is specified.

- Single rank memory configuration

Logical memory capacity = (Physical memory capacity * Number of DIMMs) – (Physical memory capacity)

- Dual rank memory configuration

Logical memory capacity = (Physical memory capacity * Number of DIMMs) – (Physical memory capacity / 2)

Replacing the Battery

All motherboards use a battery to maintain system configuration information. If it fails to maintain system configuration, replace it with an identical rated battery from the same manufacturer.

Remove the battery from the motherboard as follows:

Caution

Removing the battery from the motherboard causes the computer to lose system configuration information. Before removing it, run Setup and record the system configuration settings.

Use this information to restore the system after replacing the battery.

1. Turn off and unplug the system unit and any external options connected to the system.
2. Remove the right side door. See [“Removing and Installing the Right Side Door” on page 111](#).
3. Locate the battery on the motherboard. See [“Motherboard” on page 25](#).
4. Use your finger to carefully remove the battery from the battery socket on the motherboard.

Warning

The battery may explode if it is incorrectly replaced or improperly discarded.

Use only an identical rated battery from the same manufacturer.

5. With the positive (+) side facing up, press the new battery into the socket.
6. Replace the right side door.
7. Connect external peripherals and power cables.
8. Run Setup to reconfigure system parameters.

Internal Cabling

Internal cable connections of the server are shown below.

Interface Cables

An example of the connections of interface cables between devices within the server and external devices is shown below.

Standard Configuration

The figure below shows an example of the connections in the standard configuration. The onboard SAS #1 connector is connected to the hard disk drive bay.

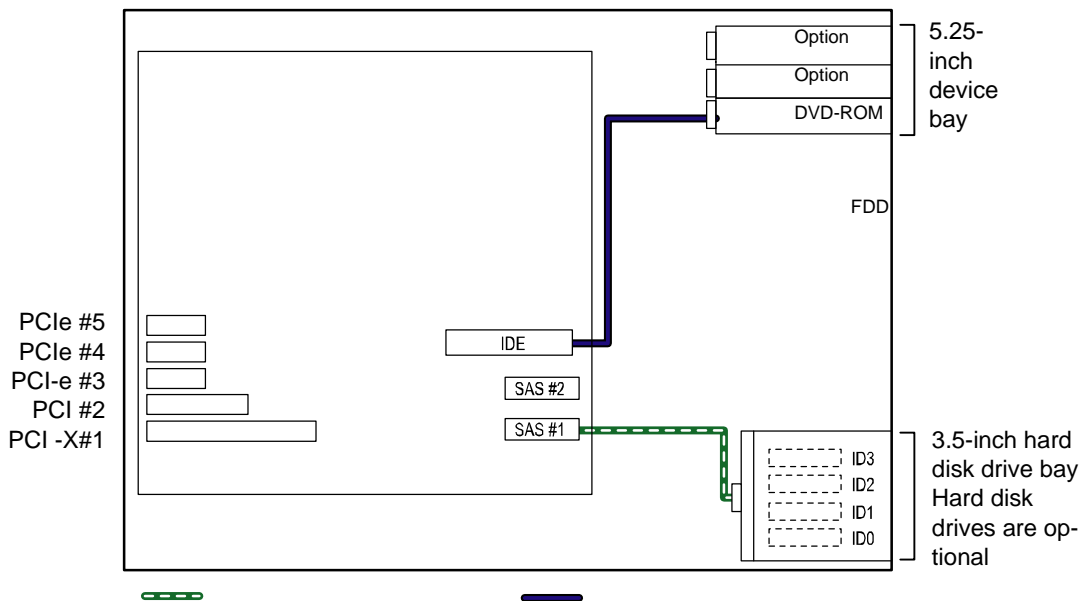


Figure 93: Standard configuration

Black line = IDE cable
 Green line = SAS cable

Installing Additional HDD Cage

The figure below shows an example when five or more hard disk drives are to be connected. The onboard SAS #2 connector is connected to the additional HDD cage.

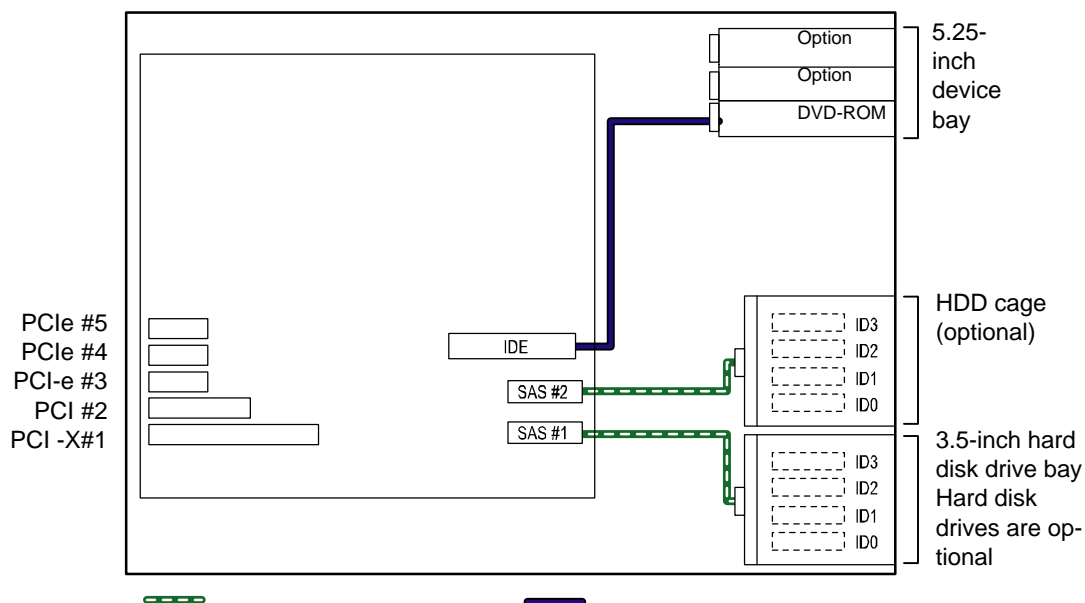


Figure 94: Additional HDD Cage configuration

Black line = IDE cable
Green line = SAS cable

Installing Internal SCSI File Device

With the standard configuration, you need an optional SCSI controller and internal SCSI cable to install a file device.

Caution

- Up to two SCSI devices can be installed in the server.
- To install two half-height SCSI devices in the 5.25-inch device bay, move the factory-installed DVD-ROM drive to the top bay.

Some SCSI cables are equipped with terminating resistor. Set "Disabled" for all the terminating resistors of connected devices. For other setting, refer to the manual provided with the device.

A file device needs settings such as a SCSI transfer rate. For the transfer rate, see the manual provided with the file device. Use the BIOS utility of the SCSI controller to make the settings. For details, see the manual provided with the SCSI controller.

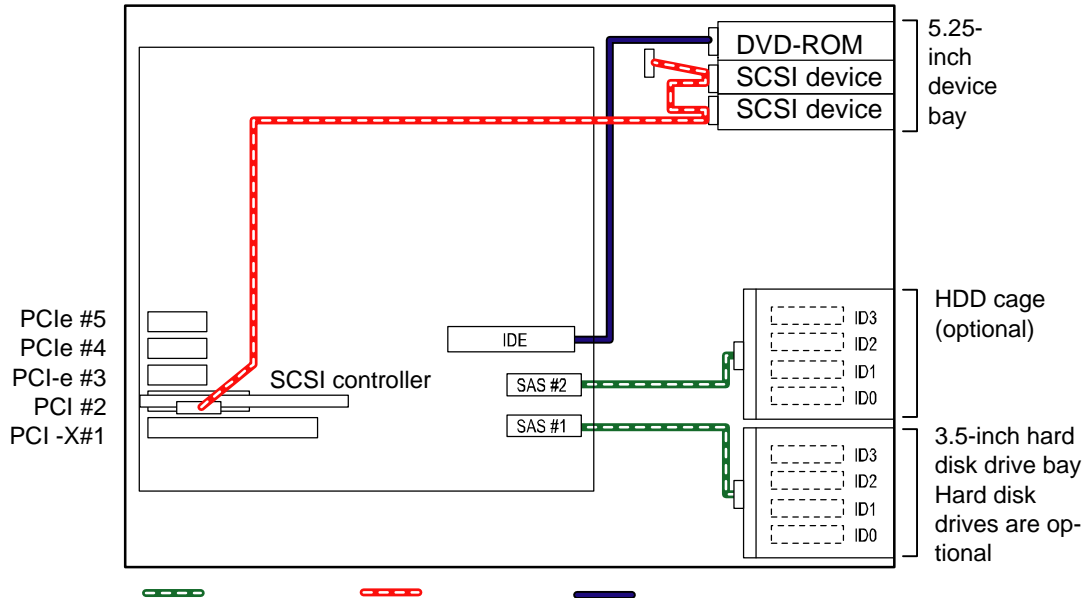


Figure 95: Additional SCSI Device Configuration

Green cable = SAS
 Red cable = SCSI
 Blue cable = IDE

Installing Internal DVD-RAM Drive

The internal DVD-RAM drive is an IDE device option. The server can be equipped with one internal DVD-RAM drive. Set the operation mode of optional DVD-RAM drive to "SLAVE". (The factory-installed DVD-RAM drive is set to "MASTER".)

Use the cable connected to the onboard IDE connector. First connect the cable to internal DVD-RAM drive, and then to the factory-installed DVD-RAM drive.

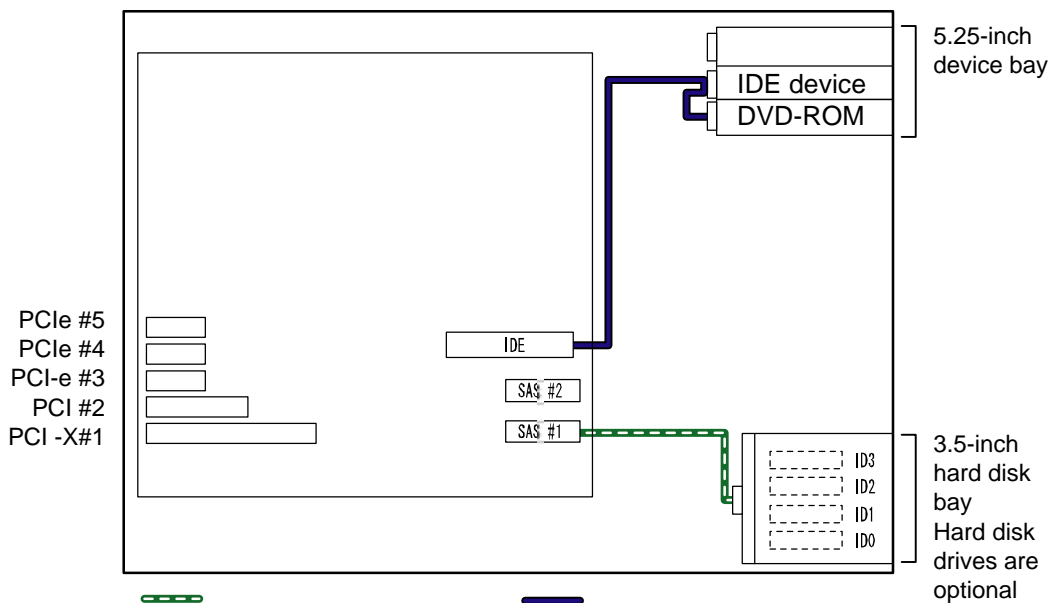


Figure 96: Additional DVD-RAM Configuration

Green cable = SAS
Blue cable = IDE

Connecting with External SCSI Device

To install the internal SCSI file device, you need prepare a separately priced SCSI controller and SCSI cable.

Assign the unique SCSI ID to each device. Enable the terminating resistor of the last device of the connection. (If no device is connected, installing a terminating resistor on the rear connector is not required.) The total cable length (including internal cable) must be 3 m or shorter.

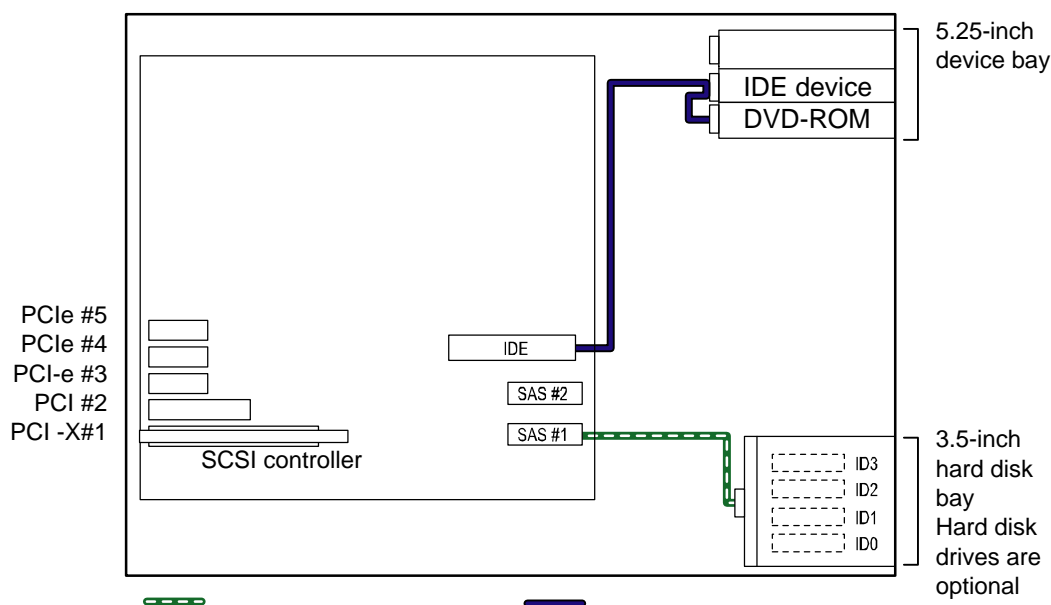


Figure 97: Additional External SCSI Device Configuration

Green cable = SAS
 Blue cable = IDE

*Connecting with Additional Disk Unit /
 Sample Connection in Maximum Configuration*

To connect an additional disk unit with the server, a disk array controller (LSI 20320 SCSI controller, LSILogic MegaRAID SAS 8480E or MegaRAID SCSI320-2) is required.

Caution

To connect with additional disk unit, use the server of rack-mount type, or use the additional disk unit of tower type (pedestal type). In both cases, you need an optional conversion kit.

The additional disk unit can be connected to the server equipped with the disk array controller board. (A single disk unit contains 14 hard disk drives. Up to two units can be connected.)

The server can be connected with up to 121 hard disk drives (9 hard disk drives internally installed and 6 units of additional disk unit (each unit can contain 14 hard disk drives).

Four SCSI disk array controller boards are required to connect the server with additional disk unit. The server can be equipped up to four SCSI disk array controller board. Accordingly, in this configuration, the eight hard disk drives installed in hard disk drive bay and HDD cage are controlled by onboard RAID controller and used as RAID0 or RAID1 disk array, or a single SCSI device.

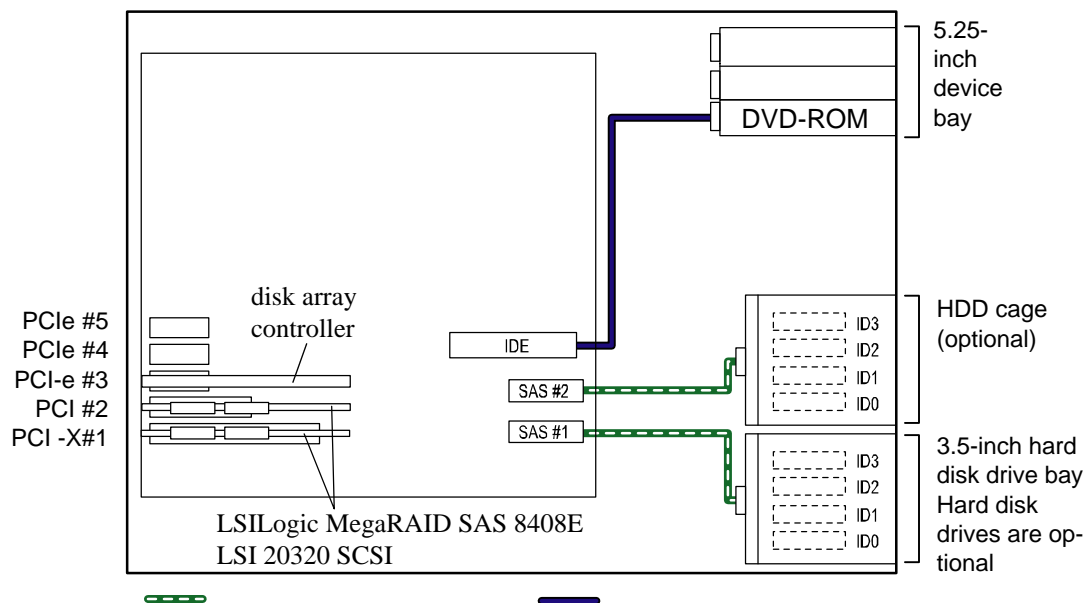


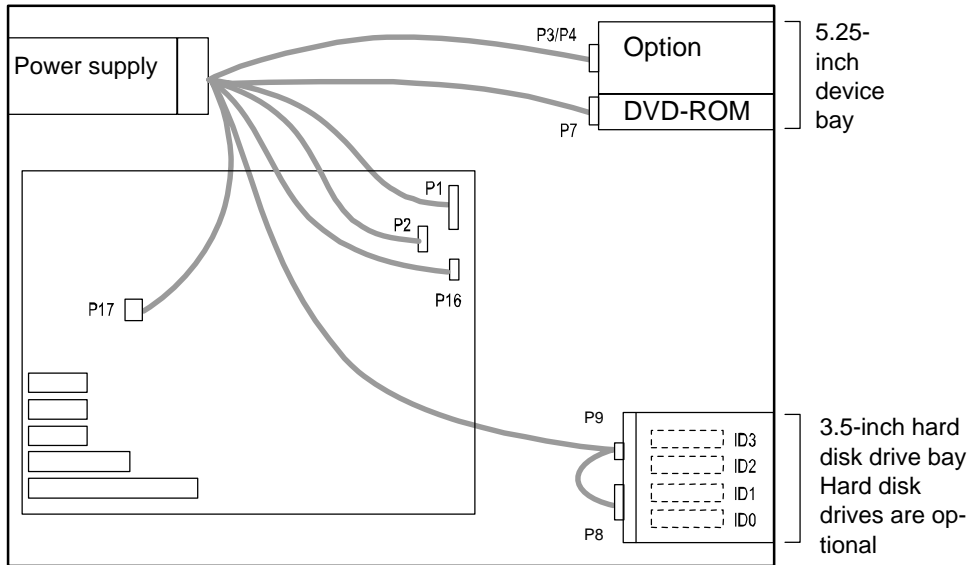
Figure 98: Additional Disk Unit Sample Configuration

Green cable = SAS
 Blue cable = IDE

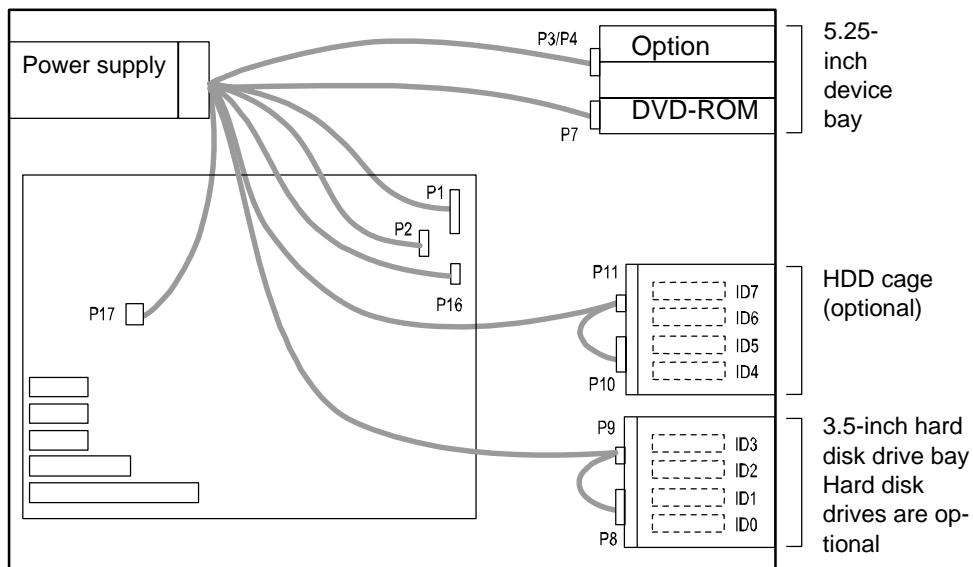
Power Cable

Proper connector numbers of format Pnn (nn: numeral) are printed on the power cables connected to the power unit installed in the server. The connector numbers and the internal devices to which the connectors are connected are shown in the figures below.

Standard Configuration



Installing HDD Cage



Problem Solving

This chapter helps you identify and solve problems that may occur during system installation or while using your system. The first section of this chapter tells you how to reset your system in the event of problems. The next few sections provide troubleshooting checklists and procedural steps that help you isolate specific system problems. The last section includes BIOS and system user information.

Warning

The DC push-button on/off switch on the front panel does not turn off completely the system AC power. +5vdc is present on the motherboard whenever the AC power cord is connected between the system and an AC outlet. Before doing the procedures in this manual, make sure that your system is powered off and unplug the AC power cords from the back of the chassis. Not disconnecting power before opening your system can result in personal injury and equipment damage

Caution

Running your system with the cover removed can damage your system components.
For proper cooling and airflow, always replace the right side door before powering on your system.

Static Precautions

An electrostatic discharge (ESD) can damage disk drives, option boards, and other components. You can provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground when handling system components.

Electronic devices can be easily damaged by static electricity. To prevent damage, keep them in their protective packaging when they are not installed in your system.

Resetting the Server

There are two ways to reset the server.

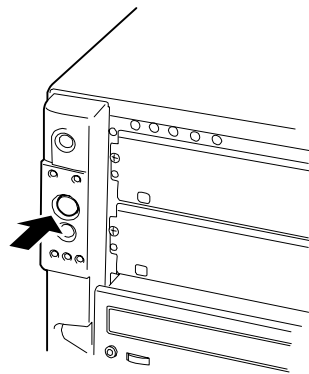
Caution

Resetting the server clears the DIMM memory and the data in process.

To reset the server when it is not frozen, make sure that no processing is in progress.

■ Hard reset

Press the RESET switch at the front of the server..



Caution


If the remote power-on function is used, cycle the power once to load the OS, and turn off the power again in the normal way.

■ Soft reset

If the server halts before starting the OS, press and hold **Ctrl** and **Alt** and press **Delete**. This restarts the server.

Troubleshooting Guide

If your server does not operate as expected, read this chapter before assuming a failure.

 *Note: For provision against an unexpected failure, it is recommended to install the Off-line Maintenance Utility, NEC ESMPRO, to the server and client computers.*

System Viewers

Monitor the fault occurrences with NEC ESMPRO during the system operation.

Especially take note on whether any alert is reported to NEC ESMPRO Manager on the management PC. Check whether any alert is reported on the Operation Window, Data Viewer, or Alert Viewer of NEC ESMPRO Manager.

Problems at initial System Start-up

Problems that occur at initial system start-up are often caused by incorrect installation of components or incorrect configuration. Hardware failure is a less frequent cause.

- Are all cables properly connected and secure?
- Is AC power available at the wall outlet?
- Are the configuration settings correct in Setup? Are all drivers properly installed?
- Are all the expansion cards fully seated in their slots on the motherboard?
- Are all DIMMs installed correctly?
- Is the processor fully seated in its socket on the motherboard?
- Are switches and jumpers on the motherboard correct (if they have been changed from their original default settings)?
- Are all jumper and switch settings on optional add-on cards and peripheral devices set correctly? Check the documentation included with these devices for details. Ensure that there are no system resource conflicts between hardware components. (For example, two add-on cards could inadvertently share the same interrupt, resulting in a conflict.)
- Are adapter cards and disk drives correctly installed?
- Is the keyboard properly connected to the system and is it connected in the right PS/2 port?
- Is a bootable diskette installed in your system's floppy drive A:?
- Is the hard disk properly formatted or defined?
- Is the operating system properly loaded? Check the operating system documentation.

Problems After the System Has Been Running Correctly

After the system hardware and software have been running correctly, problems can indicate equipment failure. Use the checklist below to try and correct the situation.

If the problem recurs after you have checked these items, refer to the [“Troubleshooting Guide” on page 190](#) section earlier in this chapter.

- If you are running software from a diskette or CD, try using a new copy.
- If you are running software from a hard disk drive, make sure that all of the necessary files are installed. There may be a problem with the copy on the hard disk. Reinstall the software on the hard disk and try again.
- If problems appear intermittently, there may be a loose cable, dirt in the keyboard (if keyboard input is incorrect), or other random component failures.
- A transient voltage spike, power cut, or brownout may have occurred. Symptoms of voltage spikes include a flickering video display, unexpected system reboots, and the system not responding to user commands. If necessary, exit any open applications and shut down your system power. Reboot the system, then load the software and try again.
- Voltage spikes can occasionally cause the heads of the disk drive to contact the disk. This can corrupt or destroy data files. If you are experiencing voltage spikes on the AC electrical power line, install an uninterruptible power supply between the power outlet and the system’s power cord.

Problems Running New Application Software

Problems occurring when you run new application software are usually related to the software. Faulty equipment is much less likely, especially if other software runs correctly. Use the checklist below to see if the situation may be easily corrected. If the problem persists after you have checked these items, contact the software vendor's customer service.

- Does the system meet the minimum hardware requirements for the software? Refer to the software documentation.
- Is the software an authorised copy? Unauthorized copies often do not work. Obtain an authorised copy of the software.
- If you are running the software from a CD or diskette, is it a good copy?
- If you are running the software from a CD, is the disc scratched or dirty?
- Is the software correctly installed? Were all necessary procedures followed and files installed?
- Are the correct device drivers installed?
- Is the software correctly configured for the system?
- Are you using the software correctly?

Problems and Suggestions

Contact your Authorised Service Representative if the suggested actions do not solve the problem.

Table 25: Problems and Suggestions

What to do	What to do
Application software problems	<p>Make sure all cables are installed correctly.</p> <p>Verify that your system hardware configuration is set correctly. In Setup, check the values against the system settings that you previously recorded. If an error is evident (wrong type of drive specified, for example), make the change in Setup and reboot the system. Record your change.</p> <p>Make sure the software is properly configured for the system. Refer to the software documentation for information. Try a different copy of the software to see if the problem is with the copy you are using.</p> <p>If other software runs correctly on the system, contact the vendor of the failing software.</p>
Characters on screen are distorted or incorrect	<p>Make sure the brightness and contrast controls are properly adjusted. Make sure the monitor's video signal cable and power cables are properly installed. (Shut down system power before reconnecting cables.) Make sure your monitor is compatible with the video mode you have selected. (Check your monitor's documentation.)</p>
Characters do not appear on screen	<p>Make sure the monitor is plugged in and turned on. Are the brightness and contrast controls properly adjusted? Make sure that the video signal cable is properly connected. (Turn the system power off before reconnecting cables). Make sure your system's video adapter card is installed, enabled. Reboot the system.</p>
CMOS RAM settings are wrong	<p>If system settings stored in CMOS RAM change for no apparent reason (for example, the time of day is in error), the backup battery may no longer have enough power to maintain the settings. Replace the battery.</p>
Diskette drive light does not go on when drive is in use or is tested by POST.	<p>Make sure the power and signal cables for the drive are properly installed. Check that the drive is properly configured and enabled in Setup.</p>
Hard drive light does not go on when drive is in use or is tested by POST.	<p>Make sure the power and signal cables for the drive are properly installed. Make sure the front panel connector is securely attached to the motherboard headers. Check that the drive is properly configured and enabled in Setup. Check the drive manufacturer's manual for proper configuration for remote hard disk drive activity.</p>
Power on light does not go on	<p>If the system is operating normally, check the connector between the motherboard and the front panel. If OK, the light may be defective.</p>

Problems with the Express Server

Error message when using the Boot-On-LAN feature with Microsoft® Remote Installation Service:

The SAS ROMB (RAID On MotherBoard) feature requires 22 kB of conventional memory. This reduction in memory is known to cause a problem when using the Boot-On-LAN feature with the Microsoft Remote Installation Service (RIS). The following message will be displayed:

Windows NT has found only 509K of low memory. 512K of low memory is required to run Windows NT. You may need to upgrade your computer or run a configuration program provided by the manufacturer.

If Microsoft RIS is required to be used on this server, then it is necessary to run with SAS ROMB disabled (see “Enabling the RAID Feature” on page 91) or use additional hardware to provide the RAID functionality (LSILogic MegaRAID SAS 8408E or LSI MegaRAID SAS ZCR 8300XLP).

The server does not power on:

- 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 broken shield or bent plugs.
 - Make sure the power breaker for the connected power outlet is on.
 - If the power cord is plugged to a UPS, make sure the UPS is powered and it outputs power. See the manual that comes with the UPS for details.
Power supply to the server may be linked with the connected UPS using the CMOS Setup utility of the server.
<Menu to check: [Server] - [AC-LINK]>

- Did you press the POWER switch?
 - Press the POWER switch on the front of the server to turn on the power (the POWER/SLEEP lamp lights).

The server does not power on:

- Is the power switch enabled?
 - Restart the server and start the BIOS SETUP utility.
<Menu to check: [Security] - [Power Switch Inhibit]>

- Is the server running in the Secure Mode?
 - The POWER switch is disabled in the Secure Mode. (Forced shutdown is also not available.) To release the Secure Mode, enter the password specified with the BIOS SETUP utility.

POST fails to complete:

- Is the DIMM board installed?
 - At least one DIMM boards are required for operation.
- Is the memory size large?
 - The memory check may take a few seconds if the memory size is large. Wait for a while.
- Did you perform any keyboard or mouse operation immediately after you started the server?
 - If you perform any keyboard or mouse operation immediately after start-up, POST may accidentally detect a keyboard controller error and stops proceeding. In such a case, restart the server once again. Do not perform any keyboard or mouse operation until the BIOS start-up message appears when you restart the server.
- Does the server contain appropriate memory boards or PCI devices?
 - Operation of the server with unauthorized devices is not guaranteed.

Fail to access to internal or external devices (or such devices fail to operate):

- Are cables properly connected?
 - Make sure that the interface cables and power cord are properly connected. Also make sure that the cables are connected in the correct order.
- Is the power-on order correct?
 - When the server has any external devices connected, power on the external devices first, then the server.
- Did you install drivers for connected optional devices?
 - Some optional devices require specific device drivers. Refer to the manual that comes with the device to install its driver.
- Is BIOS configuration correct?
 - When the server has PCI devices connected, make sure to set the PCI device interrupt and others with the BIOS SETUP utility of the server. Refer to the manual that comes with the board for details to make correct settings.
 - Some devices connected to the serial, parallel or USB port may require I/O port address or operation mode settings. Refer to the manual that comes with the board for details to make correct settings.

The keyboard or mouse fails to operate:

- Is the cable properly connected?
 - Make sure that the cable is connected to the correct connector on the rear of the server.
 - The keyboard or mouse does not operate if it is connected when the server is powered (not applicable to USB devices). Power of the server first and connect it properly.
- Is BIOS configuration correct?
 - The keyboard and mouse may be disabled with the BIOS SETUP utility of the server. Check the settings with the BIOS SETUP utility.
<Menus to check: [Advanced] - [Numlock]>
- Are the server drivers installed?
 - Refer to the manual that comes with your OS to check that the keyboard and mouse drivers are installed. (These drivers are installed along with the OS.) Some OS's allow you to change the keyboard and mouse settings. Refer to manual that comes with your OS to check that the keyboard and mouse settings are correct.

Fail to access to the DVD-ROM:

- Is the disc properly set in the optical disc drive tray?
 - The tray is provided with a holder to secure the disc. Make sure that the disc is placed properly in the holder.
- Is the disc applicable to the server?
 - Macintosh discs cannot be read.

Inserted the correct disc but the message like the following is displayed:

<The CD-ROM is not inserted or the wrong CD-ROM is inserted.
Please insert the correct CD-ROM.
OK >

- Is the data side of the disc dirty or injured?
 - Take the disc out of the optical disc drive, confirm that it is not dirty or injured, reset and click [OK].

Fail to access the hard disk: (Refer to the documentation supplied with the disk array controller.)

- Is the hard disk applicable to the server?
 - Operation of any device that is not authorized by the manufacturer is not guaranteed.
- Is the hard disk properly installed?

- Make sure to lock the hard disk with the lever on its handle. The hard disk is not connected to the internal connector when it is not completely installed.

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 SCSI devices properly configured?
 - When the server has external SCSI devices connected, devices settings, including SCSI ID and terminator, are required. Refer to the manual that comes with the SCSI device for details.
- Are the SCSI controllers (including optional controllers) properly configured?
 - Use the BIOS SETUP utility for proper configuration of SCSI devices connected to the SCSI connector on the motherboard. When the server has an optional SCSI controller installed and SCSI devices connected to it, use the BIOS Setup utility that comes with the optional SCSI controller for proper configuration. See the manual that comes with the optional SCSI controller for details.

Problems with Windows Server 2003

Windows Product Activation

This copy of Windows must be activated with Microsoft before you can continue. You cannot log on until you activate Windows. To shut down the computer click Cancel.

In Windows Server 2003, the above message will be displayed if you use the operating system without executing the license authentication. Select "Yes", and execute the procedure for license authentication.

Cannot install the operating system correctly.

- Did you check the notes on installing the operating system?

During installation, the following warning is registered in the System Log of the Event Viewer:

Error detected on the device \Device\CdRom0 during the paging operation.

- There is no problem on this issue.

Fail to start the OS:

- Is a floppy disk in the floppy disk drive?
 - Take out the floppy disk and restart the server.
- Is the ExpressBuilder CD-ROM in the DVD-ROM drive?
 - Take out the ExpressBuilder CD-ROM and restart the server.

- Is the OS broken?
 - Use recovery process to recover the system. (See "Recovery for Windows 2000 System" in this Chapter.)

The OS presents unstable operation:

- Did you update the system?
 - Installing a network drive after installation of the OS may cause unstable operation. Use the ExpressBuilder CD-ROM to update the system.

The system does not restart automatically when a stop error occurs, though the system is adjusted to automatically restarting:

- When the system does not restart automatically, restart it manually.

The system restarts automatically when a stop error occurs, though the system is NOT adjusted to automatically restarting:

- There is no problem about this issue. Check the System Event Log to check that STOP error occurred.

Cannot turn the power OFF at the blue screen:

- If you want to turn off the power at the blue screen, execute forced shutdown (forced shutdown: continue to press POWER/SLEEP switch for 4 seconds). The power will not be turned off if you press the switch for less than 3 seconds.

The PXE boot (network boot) fails or the server is not found on the network:

- Is the cable connected properly?
 - Connect the proper cable to the network port on the rear of the Express server. In addition, make sure that the used cable conforms to the network interface standard.
- Is BIOS configuration correct?
 - The internal LAN controller may be disabled with the CMOS Setup utility of the server. Check the setting with the BIOS setup utility.
- Have the protocol and service already configured?
 - Install the distinctive network driver for the server. Make sure that the protocol, such as TCP/IP, and services are properly specified.
- Is the transfer speed correct?
 - Open the network property dialog box in control panel to specify the link speed and duplex value the same as the value specified for HUB.

The Telnet Service is not installed.

- Adjust the computer name to 14 characters or less, and then install the Telnet Service as described below:

1. Click [Run] on Start menu.
2. Type "tlntsvr /service" in the [Open] box, and click [OK].
3. Click Start menu, point to [Control Panel] and click [Computer Management] and then click the [Services] to specify whether the Telnet Service is registered.

Once the installation of Telnet Service is finished, you can reset the computer name to 15 characters or more.

Problems with Windows Server 2003 x64 Editions

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.

- The system can be operated normally.

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.

- If this event disappears when the system is rebooted, the system can be operated normally.

Problems with Windows Server 2003 R2

In some case, an event log is registered as follows when you operate Windows Server 2003 R2.

Source: IPMIDRV

Type: Error

Event ID: 1001

Description: The IPMI device driver attempted to determine if the system supported an IPMI BMC device. The driver attempted to detect the presence of the IPMI BMC by searching the SMBIOS for Type 38 record. But either no record was found or the record was not compatible with the version of the device driver.

If a SMBIOS Type 38 record was detected, the Dump Data field of the event contains a binary representation of the record.

- If you use the "Hardware Management" feature provided by Windows Server 2003 R2, above-shown event log will be registered.

Problems with ExpressBuilder

When the server does not boot from the ExpressBuilder CD-ROM, 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, an error message will appear or the OS will boot.
- Is BIOS configuration correct?
 - The boot device order may be specified with the CMOS Setup utility of the server. Use the CMOS Setup utility to change the boot device order to boot the system from the optical disc drive first.
<Menu to check: [Boot]>
- Is an error message displayed?
 - 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.

Table 26: Error Messages

Message	Cause and Solution
This machine is not supported	This ExpressBuilder version is not designed for this server. Execute the ExpressBuilder on the compliant server.
Hard disk access error	The hard disk is not connected or has failed. Check whether the hard disk is correctly connected.
NvRAM access error	An access to the non-volatile memory (NvRAM) has failed.
The system-specific information does not exist on the baseboard. Please restore the backup data or write the data by using [System Information Management] of the Off-line Maintenance Utility. Only the authorized personnel are allowed to do this operation.	The system-specific information can't be acquired on the mother board.

Problems with Express Setup

The following message appears when you try to install Express Setup to the hard disk that has smaller capacity than the specified partition size:

“The specified partition size has exceeded the capacity of the hard disk. The setup created the partition at the maximum size that can be reserved on the hard disk. Setup will continue the process.”

Then the system displays the OK button.

- It is not an abnormal condition. Press Enter to continue the installation.

The message “Press R to retry” can not be displayed correctly when copying the files from an optical disc or checking an optical disc:

- Press R. When the message appears again even if you press R, restart the Express Setup from the beginning. In case the same result occurred after the restart of installation, contact Maintenance Service Company and ask them to check the optical disc drive.

Express Setup terminated and asks to input setup information.

- There are some errors on the specified setup information. Follow the instruction to input the correct value. It is not necessary to cancel the installation. On Windows 2000, you might be asked to press Enter again after the last reboot of the setup.

[Complete] appears on the [Role of Computer] screen.

- If you select [Complete] here, the setup will select the default value of Express Setup for the later specification to continue the process.

Table 27: Default Value for Windows 2000

Specification of network Protocol	
Protocol	TCP/IP[DHCP Specified]
Service	Select sharing Microsoft network files and printer.
Client	Microsoft network client.
Component	SNMP, IIS (Excluding Professional)
Application	NEC ESM PRO Agent
	Power Console Plus (With a disk array system)
	MegaRAID Storage Manager (With a disk array system)

[Complete] does not appear on [Role of Computer] screen.

- The [Complete] does not appear if the Setup File that has already been created is loaded.

- [Complete] appears only when you first entered the [Role of Computer] screen. Once you go to the next screen from [Role of Computer], the [Complete] will not appear even if you click [Back] to go back to the [Role of Computer] screen.

Selected [Use Existing Partition] at [System Partition], but the OS is installed in the whole area of the disk.

- Is there any other partition than the partition to re-use (excluding maintenance area)? If no other partition exist, the setup will reserve the whole area of the disk to install operating system.

Specified to join the Domain, but the system is installed as Workgroup.

- When the setup fails to join the Domain during the installation, it will install the system as Workgroup. Open [System] in Control Panel to specify joining the Domain.

Specified large value as partition size, but when Windows 2000 is actually started, the system partition is created by 4095MB.

- Is the [Partition Size] specified by the value larger than the real area?
 - If you want to create one partition in all area of the hard disk (excluding the maintenance area) to install the OS, specify [All Area].
- Are you specifying over 200GB for the partition size?
 - Be sure to specify less than 200GB for the partition size.

Windows 2000 started with different display resolution from the specified value.

- If the specified display resolution can not be used, the system will use the nearest value or the default value of the driver.

Entered the incorrect Product ID/CD key.

- Even if you entered the incorrect Product ID/CD key, Express Setup will start. However, the setup will stop and asks you to re-enter the correct value. Also in this case, input request will occur when rebooting after GUI setup completed during Express Setup. If these 2 inputs are done correctly, there is no problem on Windows 2000 setup.

Unable to specify the details of Network adapter.

- In Express Setup, you can not specify the details of Network adapter. Specify them from Control Panel after starting Windows 2000.

Windows 2000 is started with Network adapter that has not been specified during Express Setup

- Windows 2000 will install the recognized Network adapter specified as default value. If you want to modify the specification, it can be done from Control Panel after starting Windows 2000. Also, the Network adapter that has been specified during Express Setup but that is not connected will not be setup, though the protocol will only be installed.

Connected more than two Network adapter and specified different protocol for each adapter, but all the protocols are specified on either adapter.

- It's a design. Each adapter is specified so that all the installed protocols can be used. The value that can not be specified during Express Setup will all be specified by default value.

When more than two Network adapter are specified, the detailed specification of TCP/IP protocol are all set to use DHCP.

- When more than two Network adapter are specified, the detailed specification of the protocol may all be set by default value. Re-specify the details from Control Panel.

Not more than two Network adapter is connected, but the detailed specification of the protocol are all set by default.(e.g. Specified IP Address on TCP/IP, but DHCP is specified)

- Are you specifying more than two protocols? In this case, the situation will be the same as connecting more than two Network adapter, so the detailed specification of the protocol are all set by default. Re-specify the details from Control Panel after starting the OS.

The following error log is included in the event log while operating the system:

<Windows 2000>

Event ID: 16

Source: iANSMiniport

Type: Error

Category: None

Description: Team #0: The last adapter has lost link.

Network connection has been lost.

Event ID: 11

Source: iANSMiniport

Type: Warning

Category: None

Description:Adapter link down: Intel(R) 82546EB Based Dual Port Network Connect...

Though the above error is included in the event log when specifying the teaming, the LAN driver can work properly.

Problems with Disk Array Configuration

Refer to the Disk Array Controller User Guide.

Problems with Master Control Menu

The master control menu fails to appear:

- Is your system Windows NT 4.0 or later, or Windows 95 or later?
 - The optical disc Autorun feature is supported by Windows NT 4.0 and Windows 95. The older versions do not automatically start from the DVD-ROM.
- Is Shift pressed?
 - Setting the disc 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 disc. In such a case, start the Explorer and run \MC\1ST.EXE in the DVD-ROM.

Collecting Event Log

This section describes on how to collect the log of various events that occurred on the server.

Caution

If STOP error, system error, or stall occurred, follow the procedure below after restarting the system.

1. Click [Management Tool]: [Event Viewer] from the Control Panel.
2. Select the type of the log to collect.
 - On [Application Log], the events related to the running application is archived.
 - On [Security Log], the events related to the security is archived. On [System Log], the events occurred at the item which configures Windows system is archived.
3. Click [Save as...] in the [Run] menu.
4. Input the file name of archived log in the [File Name] box.
5. Select the type of the log file you want to save in the [File Type] list box and click [OK].

For more information, refer to Windows Online Help.

Collect Configuration Information

This section describes how to collect the information on hardware configuration and inside specification.

In order to collect information, "Diagnostic Program" is used. Refer to the Windows online help.

 **Caution**

If STOP error, system error, or stall occurred, follow the procedure below after restarting the system.

Collecting Dr. Watson Diagnostic Information

Dr. Watson collects diagnostic information related to application errors. The location to save the information can be specified as you like.

Memory Dump

If an error occurs, the dump file should be saved to acquire necessary information.

If you saved the dump to DAT, write down that it is saved as "NTBackup" or "ARCServe" on the label. You can specify the location to save the diagnostic information as you like...

 **Caution**

- Consult with your service representative before dumping the memory. Dumping the memory while the server is in process may affect the system operation.
 - Restarting the system due to an error may display a message indicating insufficient virtual memory. Ignore this message and proceed. Restarting the system may result in dumping improper data.
-

Preparing for Memory Dumping

Memory dumping with the DUMP switch may disable the server to restart. In such a case, it is required to force the server to shut down. This forced shutdown, however, is not available if "Enable" is selected for "Power Switch Inhibit" on the Security menu of the BIOS setup utility, SETUP, because this setting disables POWER switch operation.

Follow the procedure below to change the setting to enable the forced shutdown and restart of the server.

1. Power on the server and start the BIOS setup utility, SETUP.

2. Select "Disable" for "Power Switch Inhibit" in the Security menu.
3. Save the configuration data and exit the SETUP.

Saving the Dump File

Press the DUMP switch to save the dump file when an error occurs. Insert a metal pin (a straightened large paper clip will make a substitute) into the switch hole to press the DUMP switch.

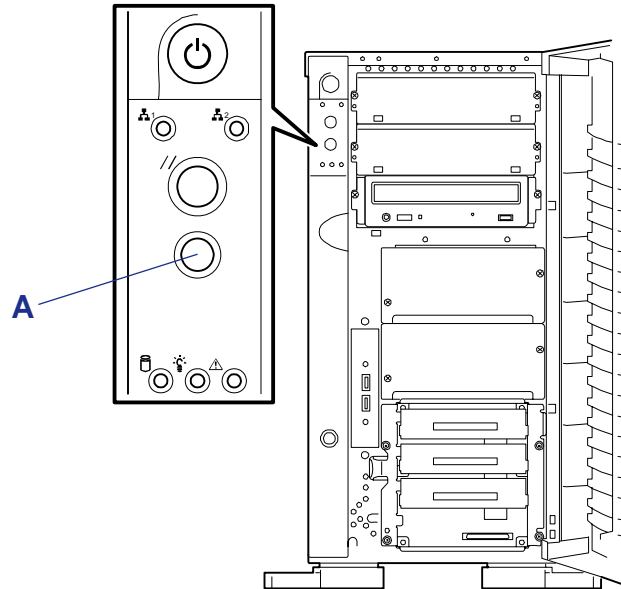



Figure 99: Dump Switch (A)

Pressing the DUMP switch saves the dump file in the specified directory. (Memory dumping may not be available when the CPU stalls.)

If You Need Assistance

If you have a problem with your computer, first review the sections of *[“Problem Solving”](#)* on page 188.

 *Note: Refer to the warranty booklet delivered with your system to find out how to contact the local office in your country.*

For technical support such as BIOS upgrades, consult our Web site at the following address: **<http://www.bull.com>**.

Error Messages

Error Messages after Power-on

Powering on the server automatically starts the self-diagnostic program, POST (Power On Self-Test). When the POST detects any error, it displays an error message and its measure on the display unit.

Follow the table below to troubleshoot such errors. However, even when there is no hardware failure, use of the keyboard or mouse at the following timing causes the POST to assume a keyboard controller error and stop processing:

- Immediately after the server is powered
- Immediately after the system is rebooted in response to a keyboard instruction (simultaneous key entry of **Ctrl + Alt + Delete**)
- Immediately after the system is rebooted in response to an OS instruction
- During hardware initialization following restart of the POST

When the POST detects a hardware failure due to the above reason, restart the server once again. If the same error message reappears, you may assume there is no hardware error. To ensure normal operation of the server, however, make sure to follow the following restrictions.

- Do not make any keyboard entry or use the mouse before the memory count appears on the screen following the server power-on.
- Do not make any keyboard entry or use the mouse before the start-up message of the Configuration Utility appears on the screen following the server reboot.

Caution

Take a note on the on-screen message before contacting your service representative.

The alarm indication would be a great help for maintenance.

POST Error Messages

When POST detects an error, it displays an error message on the display unit screen. The following table lists error codes, error messages, and actions to take.


 *Note: Take a note on the messages displayed before consulting with your sales agent. Alarm messages are useful information for maintenance.*

Table 28: POST Error Messages

Error code	Error message	Recommended Action
0200	Failure Fixed Disk	Contact your service representative.
0210	Stuck Key.	Disconnect the keyboard and connect it again.
0211	Keyboard Error	Disconnect the keyboard and connect it again. If the error cannot be corrected, contact your service representative.
0213	Keyboard locked - Unlock key switch.	Release the lock of the key switch. If the error cannot be corrected in spite of the release of the lock, contact your service representative.
0220	Monitor type does not match CMOS - Run SETUP.	Start the SETUP. If the error cannot be corrected in spite of the start of SETUP, contact your service representative.
0230	System RAM Failed at offset.	Contact your service representative.
0231	Shadow Ram Failed at offset.	
0232	Extended RAM Failed at address line.	
0250	System battery is dead - Replace and run SETUP.	Contact your service representative to replace the battery. (After restarting the computer, start the SETUP to provide the setting again.)
0251	System CMOS checksum bad - Default configuration used.	The default values have just been set. Start the SETUP to provide the setting again. If the error cannot be corrected, contact your service representative.
0252	Password checksum bad - Passwords cleared.	The password has just been cleared. Start the SETUP to provide the setting again.
0260	System timer error.	Start the SETUP to set the date and time again. If the same error occurs successively in spite of the resetting, contact your service representative.
0270	Real time clock error.	
0271	Check date and time setting.	
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.
02F4	EISA CMOS not writeable.	
02F5	DMA Test Failed.	
02F6	Software NMI Failed.	
02F7	Fail-safe Timer NMI Failed.	
0B22	Processors are installed out of order.	Request the maintenance to replace the CPU.

Table 28: POST Error Messages (Continued)

Error code	Error message	Recommended Action
0B28	Unsupported Processor detected on Processor 1.	Make sure that the server supports the CPU. If you are not sure, contact your service representative to request the maintenance.
0B29	Unsupported Processor detected on Processor 2.	
0B30	FAN1 Alarm occurred.	Contact your service representative to replace the fan.
0B31	FAN2 Alarm occurred.	
0B32	FAN3 Alarm occurred.	
0B5F	Forced to use Processor with error	Because an error is detected in every CPU, the system is forcibly started. Contact your service representative.
0B60	DIMM group #1 has been disabled	Contact your service representative.
0B61	DIMM group #2 has been disabled	
0B62	DIMM group #3 has been disabled	
0B63	DIMM group #4 has been disabled	
0B64	DIMM group #5 has been disabled	
0B65	DIMM group #6 has been disabled	
0B70	The error occurred during temperature sensor reading.	Contact your service representative.
0B71	System Temperature out of the range.	Contact your service representative to replace the fan.
0B74	The error occurred during voltage sensor reading.	Contact your service representative.
0B75	System voltage out of the range.	
0B80	BMC Memory Test Failed.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B81	BMC FirNEC MWARe Code Area CRC check failed.	
0B82	BMC core Hardware failure.	
0B83	BMC 1BF or 0BF check failed.	
0B8A	BMC SEL area full	Clear the system event logs using the BIOS SETUP utility.
0B8B	BMC progress check timeout.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B8C	BMC command access failed.	
0B8D	Could not redirect the console - BMC Busy -	
0B8E	Could not redirect the console - BMC Error -	
0B8F	Could not redirect the console - BMC Parameter Error -	
0B90	BMC Platform Information Area corrupted.	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.
0B91	BMC update firmware corrupted.	
0B92	Internal Use Area of BMC FRU corrupted.	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.	
0B94	IPMB signal lines do not respond.	This is not a fatal error. Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B95	BMC FRU device failure.	

Table 28: POST Error Messages (Continued)

Error code	Error message	Recommended Action
0B96	BMC SDR Repository failure.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B97	BMC SEL device failure.	
0B98	BMC RAM test error.	
0B99	BMC Fatal hardware error.	
0B9A	Management controller not responding.	Update the optional RMC card firmware. If the error cannot be corrected, contact your service representative.
0B9B	Private I2C bus not responding.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B9C	BMC internal exception.	
0B9D	BMC A/D timeout error.	
0B9E	SDR repository corrupt.	
0B9F	SEL corrupt.	
0BB0	SMBIOS – SROM data read error.	Contact your service representative.
0BB1	SMBIOS – SROM data checksum bad.	
8100	Memory Error detected in DIMM group #1.	Contact your service representative to replace the DIMM in the relevant group.
8101	Memory Error detected in DIMM group #2.	
8102	Memory Error detected in DIMM group #3.	
8103	Memory Error detected in DIMM group #4.	
8104	Memory Error detected in DIMM group #5.	
8105	Memory Error detected in DIMM group #6.	
8160	Mismatch processor speed detected on processor 1.	Contact your service representative.
9161	Mismatch processor speed detected on processor 2.	
None	Expansion ROM not initialized – PCI Mass Storage Controller in slot n (n: slot number)	Disable initialization of the optional device expansion ROM by using the BIOS SETUP utility (see Chapter 4).
	H/W Configuration of BMC is corrupted. !! Update BMC F/W Configuration by configuration tool !! !! Refer to BMC configuration manual !!	Use the ExpressBuilder to configure the remote management card (see Chapter 6).


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 1-2-2-3 indicates 1 beep, pause, 2 beeps, pause, 2 beeps, pause, and 3 beeps notifying that the checksum error occurred on ROM.

Table 29: POST Error Beep Codes

Beeps	Error	Recommended Action
1-2	Option ROM initialization error	Check that the BIOS SETUP is correctly configured. If the expansion of Option ROM for the additionally installed PCI board is not displayed, check that the PCI board is properly installed. If the error persists, contact your service representative to replace the motherboard or PCI board.
3-3	ROM checksum error	Contact your service representative to replace the motherboard.
1-2-2-3		
1-3-1-1	DRAM refresh test error	<ol style="list-style-type: none"> 1. Check that the DIMMs are properly connected. 2. Remove the DIMMs once, and then re-install them to check if it operates normally. 3. Contact your service representative to replace the failed DIMM or motherboard.
1-3-1-3	Keyboard controller error	<ol style="list-style-type: none"> 1. Check if the keyboard is properly connected. 2. Contact your service representative to replace the failed motherboard.
1-3-3-1	No memory or capacity check error	<ol style="list-style-type: none"> 1. Check that the DIMMs are properly connected. 2. Remove the DIMMs once, and then re-install them to check if it operates normally. 3. Contact your service representative to replace the failed DIMM or motherboard.
1-3-4-1	DRAM address error	
1-3-4-3	DRAM test Low Byte error	
1-4-1-1	DRAM test High Byte error	
1-5-1-1*	CPU startup error	Contact your service representative to replace the failed CPU or motherboard.
1-5-2-1*	No CPU installed	
2-1-2-3	BIOS ROM copyright test error	
2-2-3-1	Unexpected interrupt test error	

 *Note: Beep code 1-5-4-2 informs you that AC power supply is interrupted due to power failure or momentary voltage drop and the system is restarted. This is not an error.*

Status Indicators

Lamps

The following describes lamps on the server and their indications. See Chapter 1 for each location.

LAN ACCESS Lamp (🔌¹)

The LAN ACCESS lamp lights green when the server is connected to LAN. The lamp blinks while the server is accessed through the LAN (for packet transmission). The value next to the icon indicates the number of the network port on the rear panel.

STATUS Lamp (⚠️)

The STATUS lamp lights green when the server is in successful operation. When the STATUS lamp is unlit, it indicates that the server has been shut down or has failed. When it flashes amber, it indicates that the server has failed.

The following table lists indications about the STATUS lamp, descriptions, and actions to take.

 Note:

- If the server has the NEC ESMPRO or Off-line Maintenance Utility installed, you can view the error log to identify the cause of a trouble.
 - To cycle power to the server, shut down the server from the OS to and reboot it, if available. If the shutdown from the OS is not available, disconnect and connect the power cord to reboot the server.
-

Table 30: Status Lamp

STATUS lamp indication	Description	Procedure
On (green)	The server is operating normally.	
Flashing (green)	The server is operating with the memory or CPU unit in degraded state. A single-bit memory error has often occurred.	Check the AC POWER lamp indication on the rear panel of the server. Identify the device in degraded state by using the BIOS setup utility "SETUP," and replace it as soon as possible.

Table 30: Status Lamp (Continued)

STATUS lamp indication	Description	Procedure
Off*	The power is off.	Power on the server.
	POST is in progress.	Wait for a while. The STATUS lamp turns green when POST is completed.
	A CPU error occurred.	Turn the power off and then turn it on. If the POST screen displays an error message, take notes of the message, and contact your service representative.
	A CPU temperature alarm was detected. (Thermal-Trip)	
	A timeout occurred when the time set for the watchdog timer arrived.	
	A CPU bus error occurred.	
A memory dump is requested.	Wait until the memory dump is completed.	
On (amber)*	A temperature alarm was detected.	Check if the internal fans are clean and if the fan units are firmly connected. If the STATUS lamp indication does not change when the fans are normal, contact your service representative.
	A voltage alarm was detected.	Contact your service representative.
	All the power supply units failed.	
Flashing (amber)*	Either of the following was detected in the redundant power configuration: AC power not supplied to one of the two power supply units Failure of one of the two power supply units	Connect the power cord to supply power. If the power supply unit is faulty, contact your service representative.
	A fan alarm was detected.	Check if the fan units are firmly connected. If the STATUS lamp indication does not change when the fans are normal, contact your service representative.
	A temperature warning was detected.	Check if the internal fans are clean and if the fan units are firmly connected. If the STATUS lamp indication does not change when the fans are normal, contact your service representative.
	A power supply alarm was detected.	Contact your service representative.

* Indicates only when the optional remote management card is installed in your system.

POWER/SLEEP Lamp (💡)

The green POWER/SLEEP lamp lights to indicate normal operation while the server is powered. When the server is off-powered, the POWER/SLEEP lamp stays unlit.

The POWER/SLEEP lamp indicates that the server is running in the power-saving mode (sleep mode). If the OS supports this feature, press the SLEEP switch to place the server in the power-saving mode. The POWER/SLEEP lamp blinks green. Press the POWER switch to turn out the POWER/SLEEP lamp and place the server back in the normal mode.

The power-saving mode is only available when the OS supports the power-saving feature. Some OS's allow you to set the server to automatically turn in the power-saving mode when no access is made to the server for a certain period of time or to select the power-saving mode with a command.

DISK ACCESS Lamp (■)

The DISK ACCESS lamp indicates the state of hard disks in the 3.5-inch hard disk drive bay.

This lamp lights in green every time any of such hard disks is accessed.

When the DISK ACCESS lamp is lit in amber, it indicates that a hard disk error occurred. To identify a failed hard disk, see the lamps provided for each hard disk.

When the DISK ACCESS lamp flashes green and amber alternately or amber only, it indicates that hard disks connected to the internal disk array controller are being rebuilt (reconfiguration).

Access Lamp

The access lamp for the optical disc drive lights when access is made to a media in the drive.

Hard Disk Drive Lamp

The disk lamp on the 3.5-inch hard disk drive bay has different meanings depending on the display status.

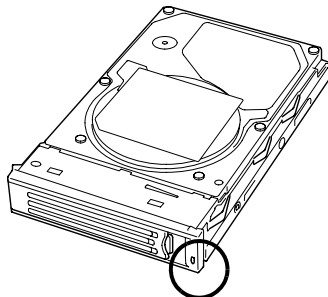




Figure 100: Hard Disk Drive Lamp

- Lit green
 - Indicates that the power is supplied to the hard disk.
- Blinking green
 - Indicates that the hard disk is accessed.
- Lit amber
 - Indicates that the installed hard disk is defective in the disk array configuration.

 *Note: While hard disks are in the disk array configuration (RAID1 or RAID5), a single failed hard disk does not affect the operation of the server. However, it is recommended to replace the failed hard disk and auto-rebuild (reconfigure) the hard disks as soon as possible. (You can hot-swap such a failed hard disk.)*

■ **Blinking alternately green or amber**

- Indicates that the hard disk is being rebuilt (this status is not a failure). If the defective hard disk is replaced with a new one in the disk array configuration, the data is automatically rebuilt (auto rebuild function). During the rebuild operation, the lamp is lit green or amber alternately.
- The lamp goes off when the rebuild is terminated normally. The lamp goes on amber if the rebuild fails.

 *Note: To abort rebuilding, power off the server. In such a case, restart the server, hot-swap the failed hard disk, and restart rebuilding. Observe the following notes to use the auto-rebuild feature.*

 **Caution**

- Do not power off the server. (If the server is powered off before rebuilding hard disks, the auto-rebuild feature will not start.)
 - When you removed a hard disk, wait at least 90 seconds before installing the hard disk back again.
 - Do not replace another hard disk while rebuilding is in progress.
-

Power Supply Lamps

 *Note: The following applies to hot-swap power supplies only.*

The power supply on the rear of the server has two lamps.


 *Note: The server equipped with an optional power unit can continue the operation with the normal power unit if the other power unit is defective (redundant function). The defective power unit can be replaced with a new one in the hot-swap mode without power interruption.*

Table 31: Power Supply Lamps

Power supply condition	Power Supply LEDs	
	LED #1 (Power) Green	LED #2 (FAIL) Amber
No AC power to all PSU	OFF	OFF
No AC power to this PSU only or power supply failure or current limit	OFF	ON
AC present / only standby output ON	Blink green	OFF
Power supply DC outputs ON and OK	Green	OFF

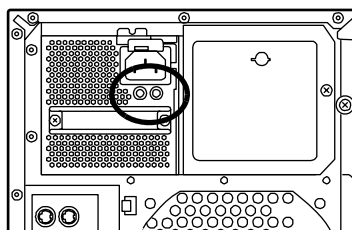


Figure 101: Power LED (left) - Power Failed LED (right)

Power Lamp

The POWER lamp flashes green if the power supply unit receives the AC power through the power cord (AC ON).

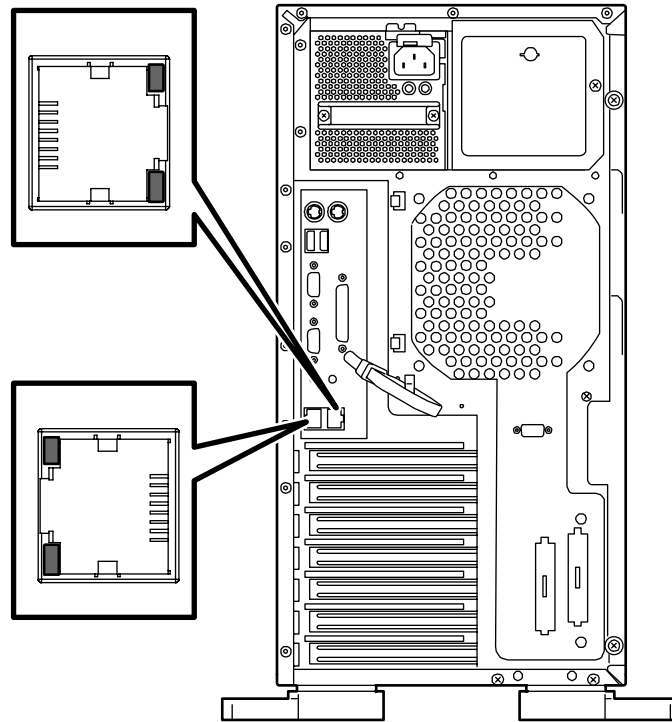
The lamp lights green when you press the POWER switch to power on the server (DC ON).

Power Fail lamp

The amber lamp lights if the power supply unit fails due to over-current, over-voltage, or fan failure.

LAN Connector Lamps

Each of the two LAN connectors on the rear panel has two lamps as follows.



■ LINK/ACT lamps

The link/ACT lamps indicate the status of the standard network ports of the server.

If the power is supplied to the server and the hub and they are correctly connected with each other, the lamp is lit green (LINK state).

If information is transmitted through a network port, the lamp blinks green (ACT state).

If the lamp does not light in the LINK state, check the network cable and the cable connection. If the lamp still does not light, the network (LAN) controller may be defective. Contact your service representative.

■ Speed lamps (for the data transmission ports)

The Speed lamp indicates whether each of the network ports is operated through the 1000BASE-T, 100BASE-TX or 10BASE-T network interface.

- If the lamp is lit amber, the network port is operating at 1000BASE-T.
- If the lamp is lit green, the network port is operating at 100BASE-TX.
- If the lamp is off, the network port is operating at 10BASE-T.

■ Speed lamps (for the management port)

- If the lamp is lit amber, the network port is operating at 100BASE-TX.
- If the lamp is off, the network port is operating at 10BASE-T.

Off-line Maintenance Utility

The Off-line Maintenance Utility is an OS-independent maintenance program. When you are unable to start the OS-dependent NEC ESMPRO to troubleshoot a problem, the Off-line Maintenance Utility can be used.

 Note:

- *The Off-line Maintenance Utility is intended for use of your service representative. The ExpressBuilder CD-ROM and the Off-line Maintenance Utility Bootable FD you have created contain a file that describes operation of the utility, but do not attempt to use the utility by yourself. Contact your service representative and follow instructions.*
 - *Starting the Off-line Maintenance Utility disables any access from a client to the server.*
-

Starting the Off-line Maintenance Utility

The Off-line Maintenance Utility may be started in the following ways.

- From the CD-ROM

Insert the ExpressBuilder CD-ROM into the optical disc drive and reboot the system. When the menu displays, select "Tools" - "Off-line Maintenance Utility". The Off-line Maintenance Utility program starts from the CD-ROM.

- From the floppy disk


Insert the Off-line Maintenance Utility Bootable FD in the floppy disk drive and reboot the system. The Off-line Maintenance Utility program starts from the boot disk. The Off-line Maintenance Utility Bootable FD is created by selecting "Tools" - "Create Support FD" on the ExpressBuilder.

- Manual start (by pressing **F4**)

When the Off-line Maintenance Utility is installed, press **F4** while the start-up screen of the server is displaying. The Off-line Maintenance Utility starts from the hard disk.

Features of Off-line Maintenance Utility

The Off-line Maintenance Utility provides the following features. (Available features vary depending on the way you started the Off-line Maintenance Utility.)

 Note: See the on-line help for details of the Off-line Maintenance Utility. For further information, ask your service representative.

■ IPMI Information Viewer*

Provides the functions to view the system event log (SEL), sensor data record (SDR), and field replaceable unit (FRU) and to make a backup copy of them. Using this feature, you can find system errors and events to determine a maintenance part.

■ BIOS Setup Viewer

Provides the functions to export the current configuration data defined with the SETUP utility to a text file.

■ System Information Viewer

Provides the functions to view information on the processor and the BIOS and export it to a text file.

■ System Information Management

Provides the function to make a back-up copy of your data.

Without the backup data, the system-specific information and/or configuration may not be restored.

Only the authorized personnel is allowed to restore the backup data.

■ Start of Utilities

With the ExpressBuilder, you can start the following utilities installed in the maintenance partition.

- System Management*
- System Diagnostics
- Maintenance Partition Update

* Available only when the optional remote management card is installed.

Appendix 1: Specifications

Table 32: Bull NovaScale T860 Specifications

Bull NovaScale T860		
Cabinet design		Mini-Tower
CPU	Type	Dual-core 64-bit Intel® Xeon™ Processor
	L2 Cache	4 MB
	Number of processors	1 (max: 2)
Chipset		Intel® 5000P (667/1066 MHz)
Memory	Type	SDRAM DIMM (DDR2-533, Chipkill)
	Error check	ECC
	Standard	2 GB (1GB * 2)
	Maximum	48 GB (4GB * 12)
Video		Server Engines Pilot (VRAM 2MB)
Auxiliary storage device	Hard disk (std)	586GB (146,5GB * 4)
	Hard disk (max)	1.172TB (146,5GB * 8) with the optional HDD cage
	Hot-plug	Supported
	Disk controller	SAS
	Floppy disk drive (optional)	USB 3.5-inch
	DVD-ROM (standard)	ATAPI interface x1 x18x40 speed
Device Bay	5.25"	3 bays including one optical drive
	3.5"	4 bays + 4 bays (optional)
I/O Slots	PCI-EXPRESS	3 slots
	64-bit/100MHz	1 slot
	32-bit/33MHz	1 slot
LAN		1000Base-T/ 100Base-TX /10Base-T (2 ports)
Management LAN		100Base-TX /10Base-T (1 port)
Disk Array		RAID0 / RAID1 / Spanning of RAID1 (standard) / RAID5 (optional)
External interface	Keyboard	MINI DIN 6-pin connector (1 port)
	Mouse	MINI DIN 6-pin connector (1 port)
	USB 2.0	4 ports: 2 at the front, 2 at the rear
	Serial	D-sub 9-pin (2 ports)
	Parallel	IEEE1284 standard, D-sub 25-pin (1 port)
	Network	RJ45 (2 ports)
	Video	Mini D-sub 15-pin 1 port
External dimensions		220mm width x 453mm height x 671mm depth (excluding stabilizers) 293mm width x 453mm height x 697mm depth (including stabilizers)
Weight		20 kg (35kg Max.)

Table 32: Bull NovaScale T860 Specifications (Continued)

Bull NovaScale T860		
Power supply	Specification	100 to 120 VAC +/- 10% 200 to 240 VAC +/- 10% 50/60Hz +/- 1 Hz
	Hot-swap	Supported
Redundant fan		Supported (optional)
Power consumption		630VA, 620W
Energy efficiency ratio		0.012 (class C) or 0.0065 (class C)
Environmental requirements	Temperature	10 to 35°C (operating), -10 to 55°C (non-operating, storage)
	Humidity	20 to 80% RH (no condensation)

Appendix 2: Interrupt Requests 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 Requests

The factory-set IRQs are assigned as follows:

Table 33: Interrupt Requests

IRQ	Peripheral Device (Controller)	IRQ	Peripheral Device (Controller)
0	System timer	9	ACPI
1	-	10	PCI
2	-	11	BMC
3	Serial Port COM2	12	-
4	Serial Port COM1	13	Numeric processor
5	PCI	14	Primary IDE
6	-	15	Secondary IDE
7	-	16	PCI
8	Real-time clock		

I/O Port Address

The factory-set I/O port addresses for the server are assigned as follows:

Table 34: I/O Port Address

Address*	Chip in Use**
00 – 1F	DMA controller
20 – 2D	Interrupt controller
2E – 2F	Super I/O configuration
30 - 31	Interrupt controller
34 - 35	Interrupt controller
38 - 39	Interrupt controller
3C - 3D	Interrupt controller
40 – 43	Timer controller
4E – 4F	Super I/O configuration 2
50 - 53	Timer/counter

Table 34: I/O Port Address (Continued)

Address*	Chip in Use**
61	Non-maskable interrupt
62	LPC reserve
63	Non-maskable interrupt
70 - 77	Real time clock, Non-maskable interrupt
80 - 91	DMA1 controller
92	Port 92
93 - 9F	DMA controller
A0 - A1	Interrupt controller
A4 - A5	Interrupt controller
A8 - A9	Interrupt controller
AC - AD	Interrupt controller
B0 - B1	Interrupt controller
B2 - B3	Advanced power management
B4 - B5	Interrupt controller
B8 - B9	Interrupt controller
BC - BD	Interrupt controller
C0 - DF	DMA controller
F0	Coprocessor error
F1 - FF	Logic device configuration
170 - 177	IDE secondary bus controller
1F0 - 1F7	IDE primary bus controller
2F8 - 2FF	Serial port 2
376	IDE secondary bus controller
370 - 377	(Floppy disk drive 2), IDE 2
378 - 37F	Parallel port
3F0 - 3F5	Floppy disk drive 1
3F6	IDE primary bus controller
4D0 - 4D1	Interrupt controller
CA2 - CA3	BMC SMS interface
CA4 - CA5	BMC SMS interface
CF8 - CFB	PCI configuration address/reset control (CF9)
CFC - CFF	PCI configuration data

* Hexadecimal notation

** I/O port address for PCI devices can be arbitrarily assigned according to the type and number of PCI devices

Appendix 3: Maintenance

This chapter describes the daily maintenance of the server and precautions when relocating or storing the server.

Making Backup Copies

We recommend you make backup copies of your valuable data stored in hard disks of the server on a regular basis. For backup storage devices suitable for the server and backup tools, consult with your sales agent.

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

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

Cleaning

Clean the server on a regular basis to keep the server in a good shape.

Warning

- 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 working with the server
-

Caution

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

Cleaning the Server

For cleaning, wipe the external surfaces of the server with a dry soft cloth. Follow the procedure below if stains remain on the surfaces:

Caution

- To avoid altering the material and color of the server, do not use volatile solvents such as thinner and benzene to clean the server.
 - The power receptacle, the cables, the connectors on the rear panel of server, and the inside of the server must be kept dry. Do not moisten them with water.
-

1. Make sure that the server is off-powered (the POWER/SLEEP lamp goes off).
2. Unplug the power cord of the server from a power outlet.
3. Wipe off dust from the power cord plug with a dry cloth.
4. Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.
5. Rub off stains on the server with the cloth prepared in Step 4.
6. Soak a soft cloth in water, squeeze it firmly, wipe the server with it once again.
7. Wipe the server with a dry cloth.
8. Wipe off dust from the fan exhaust opening on the rear of the server with a dry cloth.

Cleaning the Interior

One of the most important items in a good maintenance program is regular and thorough cleaning of the interior of the server, especially around the motherboard.

Dust buildup inside the server can lead to several problems. As dust acts as a thermal insulator, a buildup can prevent proper system cooling. Excessive heat will shorten the life of server components. Also, dust may contain conductive or corrosive materials that can cause short circuits or corrosion of electrical contacts.

How often you should clean the interior of the server depends on the environment in which it is located. For most office environments, you probably should clean the server every 12 months. For more severe environments, clean the interior every 6 months.

Cleaning the interior of the server entails powering off the server and removing the right side door. You will need a small vacuum cleaner (with plastic tipped nozzle and electrostatic protection), computer grade canned air, and a small brush for cleaning the interior.

Follow the procedure below to clean the interior of the server.

Warning

- Unplug all power cords.
 - Unplug all power cords before performing any maintenance. Voltage is present inside the server and display unit even after the power is turned off. All voltage is removed only when the power cord is unplugged.
-

Caution

Do not use a brush made of chemical fabric, or a cleaning material that will generate electrostatic discharges.

1. Turn off the server and unplug all power cables.
2. Remove the right side door.
3. Remove the dust accumulate on the air inlet of the front and the rear fan.
4. Use a small brush to loosen any dust and debris on the mother board.
5. Use computer grade canned air to blow dust off components on the mother board.
6. Use a small vacuum cleaner with plastic tip to vacuum out dust and debris from the interior of the server.
7. Reinstall the right side door.
8. Reconnect all power cables and turn on the server.

Cleaning the Keyboard/Mouse

Make sure that the server and peripheral devices are all off-powered (the POWER/SLEEP lamp goes off), and then wipe the keyboard surface with a dry cloth.

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

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

2. Make sure that the server is off-powered (the POWER/SLEEP lamp goes off).
3. Turn the mouse upside down, and rotate the mouse ball cover counterclockwise to remove it.
4. Take out the ball from the mouse. Cover the bottom of the mouse with your hand, and turn your hand holding the mouse (the mouse is on your palm with the button upward). The mouse ball is released onto your palm.
5. Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.
6. Rub off stains on the mouse ball. Softly wipe the mouse ball with the cloth prepared in Step 5.
7. Wipe the mouse ball with a dry soft cloth.
8. Wipe three small rollers inside the mouse with a cotton swab soaked with alcohol. Wipe stains slowly and carefully by rotating rollers with the tip of the cotton swab.
9. Blow out any dust from the mouse. Protect your eyes from the dust.
10. Put the mouse ball back into the mouse.
11. Place the mouse ball cover, and rotate it clockwise until it is locked.

Cleaning optical drives

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

Follow the procedure below to clean the tray and optical drive regularly:

1. Make sure that the server is powered (the POWER/SLEEP lamp is lit).
2. Press the CD tray Open/Close button on the front of the optical drive. The tray opens.
3. Hold the disc lightly and take it out from the tray.

 *Note: Do not touch the signal side of the optical drive with your hand.*

4. Wipe the tray with a dry soft cloth.

Caution

Do not wipe the lens of the optical drive. Doing so may damage the lens and may cause a malfunction of the drive.

5. Push the tray to close it.
6. Wipe the signal side of the optical drive with a dry soft cloth.

 **Caution**

Wipe discs from the center to the outside. Use only optical disc cleaner if necessary. Cleaning an optical disc with record spray/cleaner, benzene, or thinner causes damage to the disc contents.

At worst, inserting the disc into the server may cause failure.

System Diagnostics

The System Diagnostics runs several tests on the server.

Use the System Diagnostics program in the ExpressBuilder CD-ROM provided with the server to diagnose the server.

Test Items


The following items are tested in system diagnostics.

- Memory
- CPU cache memory
- Hard disk used as a system

Caution

When executing the System Diagnostics, make sure to disconnect the LAN cable.

Executing the System Diagnostics with the LAN cable connected, the network may be influenced.

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

Starting and Ending the System Diagnostics

There are two ways to diagnose the server: to use the local console (keyboard) of the server itself, and to use the management PC via serial port (remote console).

Caution

Two methods of LAN via the serial port are mentioned in Appendix E "ExpressBuilder" in the way of communicating in remote console.

Use the serial port to execute System Diagnostics with remote console. The LAN connection is not for System Diagnostics.

Procedures to start the diagnostics program is as follows:

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

2. Disconnect all the LAN cables from the server.
3. Plug the power cord and turn on the server.
4. Use the ExpressBuilder CD-ROM to reboot the server.
5. Select [Tools].
6. Select [System Diagnostics]. The System Diagnostics starts and completes in approximately three minutes. When the diagnosis completes, the test window title shows "Test End", as the following figure.

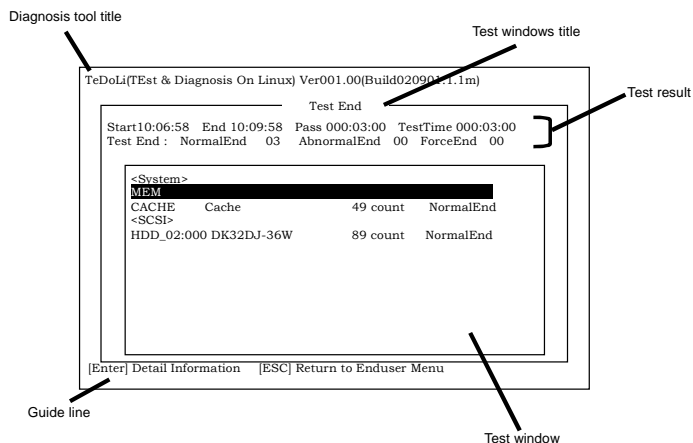


Table 3 - 1: System Diagnostics Test Window Items

Item	Description
Diagnosis tool title	shows a name of this diagnosis and Version information.
Test windows title	shows the progress of diagnosis. When it completes, it shows "Test End"
Test Result	shows the information including time of start, end and progress, and result of the diagnosis.
Guide line	shows a description of keys to navigate the window
Test window	Move the cursor and press Enter to view the detail of the diagnosis

If an error is detected during the System Diagnostics, the test result shows "Abnormal End" in red color. Move the cursor and press Enter on the diagnosis which error occurred. Take a note of the error message showed, and contact your sales agent.

7. Follow the Guide line showed in the bottom of the screen and press ESC to show the End user Menu showed below.

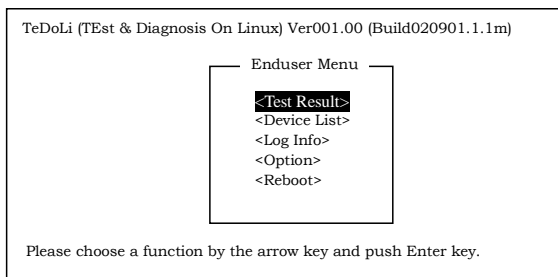


Table 3 - 2: End User Menu

Item	Description
<Test Result>	shows the screen of the diagnosis completed aforementioned
<Device List>	shows the information of all the devices connected
<Log Info>	shows the log information and error messages of the diagnosis. It can be saved to a floppy disk. To save the log information to a floppy disk, insert a formatted floppy disk to a floppy disk drive and select <Save[F]>
<Option>	optional features can be used from this menu
<Reboot>	Restarts the Express Server

8. Select <Reboot> in the End user Menu above. The BULL NovaScale restarts, and ExpressBuilder boots the system.
9. Exit the ExpressBuilder, and remove the CD-ROM from the optical disc drive.
10. Turn off the server and unplug the power cord from the receptacle.
11. Reconnect all the LAN cables to the server.
12. Plug the power code.

This completes the System Diagnostics.

Relocating/Storing The Server

Follow the procedure below to relocate or store the server:

Warning

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage.

- 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.
-

Caution

- If the server needs to be relocated/stored due to a change in the floor layout to a great extent, contact the sales agent.
 - Make sure to make a backup copy of your valuable data in the hard disk, if any.
 - Make sure not to apply a shock to hard disks to relocated the server if the contains any.
-

1. Take a floppy disk and an optical disc out of the server, if any.
2. Power off the server (the POWER/SLEEP lamp goes off).
3. Unplug the power cord of the server from a power outlet.
4. Remove all the cables from the server.
5. Hold the server by its bottom with at least three persons to carry the server.

Warning

Do not hold the front door to lift the server.

The front door may be disengaged from the server, causing personal injury.

6. Protect the server with the shock-absorbing materials, and pack it securely.

Appendix 4: Installing the Operating System with Express Setup

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

- Microsoft® Windows® Server 2003 R2 Standard Edition / Microsoft® Windows® Server 2003 R2 Enterprise Edition
- Microsoft® Windows® Server 2003 Standard Edition / Microsoft® Windows® Server 2003 Enterprise Edition

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

Caution

Before installing the operating system, adjust the system date and time by using the BIOS setup utility "SETUP". [See "BIOS Setup Utility" on page 71.](#)

About Express Setup

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

Caution

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



You can also use "Configuration diskette Creator" at "Express Setup" in order to save or backup parameters for installation.

The Configuration disk is able to have some parameters files that include the configuration information for the server setup.

If you want to set up the server as before, execute the Express Setup with the parameters file you used at the time of the initial setup.

Notes:

- The parameters file is not mandatory to set up the system.

- *If you want to create a parameters file, have a blank floppy disk (MS-DOS 1.44MB format) ready.*
 - *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 "Configuration Diskette Creator" included in ExpressBuilder.*
-

"Configuration Diskette Creator" has a function of "Mass installation". You can replicate configuration files and modify a replicated file by using this function, depending on individual server systems.

Microsoft Windows Server 2003

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

 **Note:**

- Express Setup does not support the installation of Windows Server x64 Editions. See [“Installing Microsoft Windows Server 2003 x64 Editions” on page 281](#) for more information.
 - If you install Windows Server 2003 without using Express Setup, see [“Appendix 5: Installing Microsoft Windows Server 2003” on page 261](#).
-


Installation Notice

Read these precautions before installing Windows Server 2003.

Supported Operating System on this Model

Express Setup supports the installation of the following Windows 2003 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")

 **Remarque :** Express Setup does not support the installation of Windows Server x64 Editions. If you want to install it, see [“Appendix 6: Installing Microsoft Windows Server 2003 x64 Editions” on page 278](#).

If you wish to install another operating system, contact your sales dealer or the maintenance service representative.

Installing Optional Mass Storage Driver

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

BIOS Settings

Before installing Windows Server 2003, check that the BIOS specification of the hardware is correct.

NEC ESMPRO Agent

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

Floppy Disk Drive

No internal floppy disk drive is included in your system. Prepare an optional USB floppy disk drive if necessary.

Windows Server 2003

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

Caution

- Before starting the installation, complete all the process of adding the optional device and the setup of Express server mainframe (BIOS and optional board specification)
 - After completing Express Setup, see "Setup for Solving Problems" described later to specify the settings for trouble recovery such as "Specifying Memory Dump".
-

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

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

Connect the magneto-optical device after the operating system has been successfully installed.

Connect any drives that are not mandatory after the operating system has been successfully installed.

Connect additional hard disks after the operating system has been successfully installed.

The minimum size for the partition where 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

Size necessary to install the system=

2900 MB (Windows Server 2003 only)

3500 MB (Windows Server 2003 + Service Pack 1)

3500 MB (Windows Server 2003 R2)

4400 MB (Windows Server 2003 + Service Pack 1 CD-ROM)

Paging File Size (Recommended)= Mounted Memory Size \times 1.5

Dump file Size= Mounted Memory Size + 12 MB

Application size = Required size

Caution

- 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.
It may be impossible to collect correct debugging information due to a virtual memory shortage if the paging file is insufficient, so we recommend you set a paging file large enough for the entire system.
 - The maximum paging file size which can be set on one partition is 4095 MB. If the above paging file size exceeds 4095 MB, specify 4095 MB for the paging file size.
 - The maximum dump file size for the system with more than 2 GB memory mounted is '2048 MB + 12 MB'.
 - If you install any application program or the like, add necessary space to the partition to install these programs.
-

For example, if the mounted memory size is 512 MB, the minimally required partition size will be calculated by the above formula as follows:

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

If the required partition size is larger than the size of a hard disk drive, we recommend you split the file across several disks.

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.)

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

If you want to keep the current partition, see [“Appendix 5: Installing Microsoft Windows Server 2003” on page 261](#) in order to re-install the system.

The maintenance partition (used for server maintenance) is reserved in the head of Hard Disk Drive (size of approximately 55MB).

This area is used for saving some maintenance utilities.

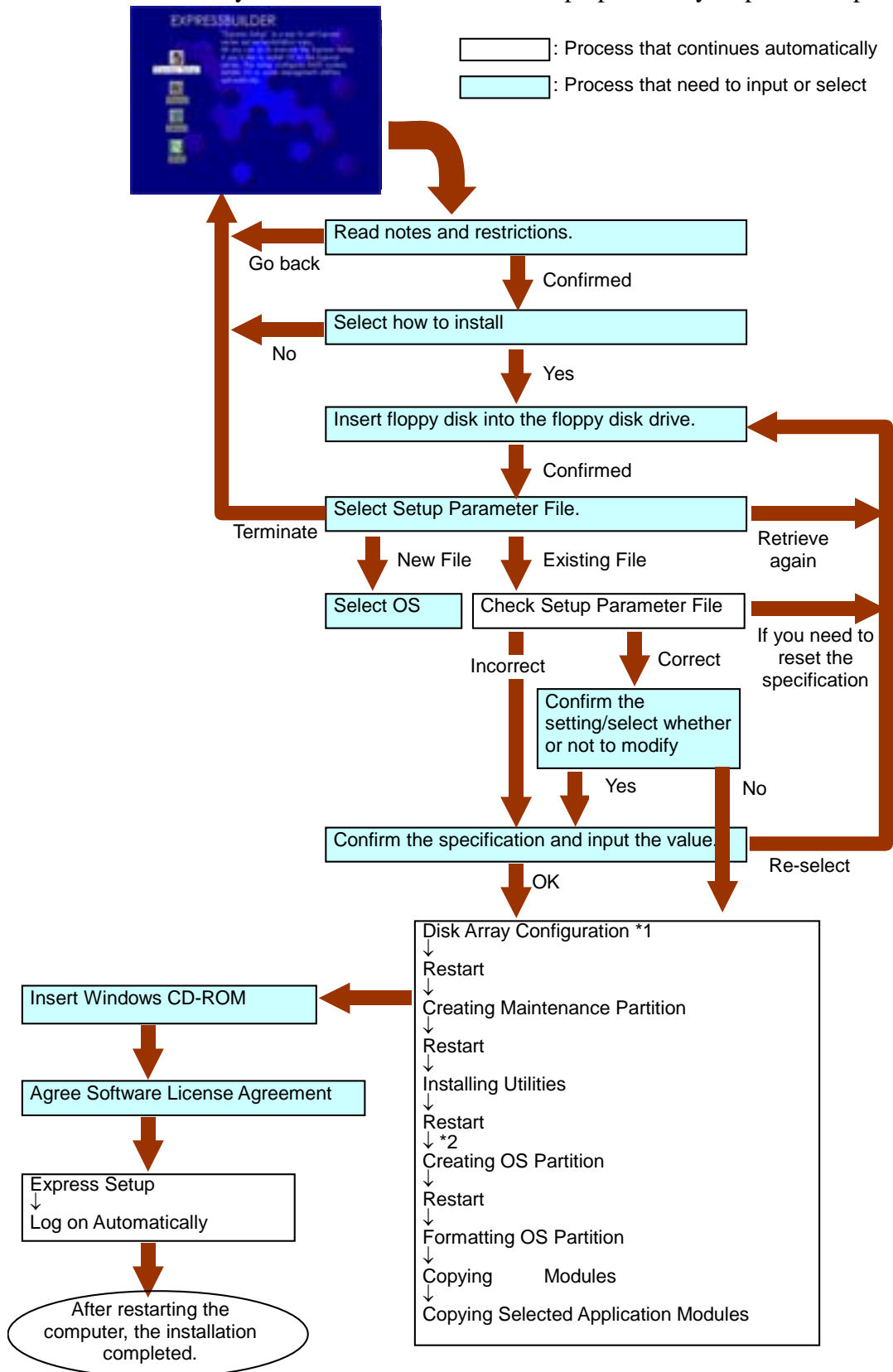
Do not delete the maintenance partition.

The ServicePack 1 is mandatory to use Windows Server 2003 with this equipment.

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

Setup Flow

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



*1 The process is operated only when Disk Array Controller Board is connected and the configuration is specified.
 *2 If you select [Others], the process is completed here.

Installing Microsoft Windows Server 2003

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

 Note:

- *Prepare a floppy disk to use as Configuration Disk if you want to save the parameters or use the drivers located on the "OEM-Disk for Mass Storage Device" that ships with optional boards. When using the floppy disk, the Express setup can continue the setup without any need for you to specify the parameters.*
- *The remote KVM console cannot use the mouse during steps 1 to 14. Use the keyboard.*

Right arrow key: Used to move to the next screens.

Left arrow key: Used to return to the previous screen.

Up/Down arrow keys: Used to select a menu.

F1 key: Displays help.

ENTER key: Used to select [OK] or to decide each item.

ESC key: Used to select [Cancel].

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

 Note:


- *If you operate installing Windows Server 2003 with a Magneto-Optical device connected, the installation may not be complete successfully. In such a case, detach the MO device and then re-install the system from the beginning.*
 - *Install the OS before connecting another hard disk drive.*
 - *If you create multiple logical drives in your system, refer to "Re-installing the Operating System".*
-

2. Insert ExpressBuilder CD-ROM into the optical device drive.
3. Ensure that the floppy disk drive is empty.
4. Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot from ExpressBuilder. (You may also turn off and then on again to reboot the server.)
The system boots from the CD-ROM and ExpressBuilder starts.


 **Caution**

Express Setup overwrites the contents of your hard disk. If you have data you want to keep, follow the on-screen instructions.

5. Click [Express Setup].
When asked if you intend to use a Configuration Diskette or Parameters File, choose either Yes or No.
6. Read the on-screen message carefully and click [OK].

 *Note: If an operating system is already installed on the hard disk, you will be prompted to confirm that you want to proceed with the installation.*


7. The message "Insert Configuration Diskette" appears. If applicable, insert "Configuration Diskette" into floppy disk drive and click [OK].

 *Note: If you do not have "Configuration Diskette", insert a blank floppy disk formatted by 1.44 MB into the floppy disk drive and click [OK].*

[Using the specified Configuration Diskette]

The Setup File included in "Configuration Diskette" is displayed.

- a. Select the Setup File name to use during the installation.

 *Note: If there is any problem that can not be modified in the Setup File you selected, the message to set another "Configuration Diskette" appears. In such case, verify the floppy disk you inserted.*

After the Setup File is specified, the message "Are you sure you want to modify the information?" is displayed.

- b. If you want to edit the information file, click [Modify]. If you do not want to edit the information file and continue the installation, click [Skip].
 - Click [Modify]. Go to step 8.
 - Click [Skip]. Go to step 12.


[Using Blank disk]

- a. Click the box under [Setup File Name: (A)] or press **A**.
The input box appears.
 - b. Input a file name. and click [Use]
 - c. [Operating System to Install] appears.
The OS supported by the computer is displayed in the list.
 - d. Select [Windows Server 2003] you want to install from the list box.
8. Verify the contents specified during OS installation.

If you are using a blank floppy disk or if you have chosen to review/change parameters, a series of configuration file screens is displayed as described below.

If you have a RAID board installed, the [Configure RAID] screen displays first. Confirm the parameters, modify if necessary, and then click [OK].

The Express Setup automatically performs the RAID configuration, creating Maintenance partition and installing several utilities.

 *Note: If you have RAID hardware installed or the onboard RAID controller is enabled, and the [Configure RAID] screen fails to display, you must solve the RAID problem before you continue with the installation.*

If no RAID configuration is set-up, the [Operating System Installation] screen displays.

9. Select the installing Operating system.
Select "Windows" from the menu.

10. Next, the [Basic Information] wizard appears. Confirm the parameters, modify them if necessary, and then click [Next].
After that, click [Next], [Back], or [Help] on the screen according to your needs. Modify the parameters anytime it is necessary.

 **Caution**

- Reserve the partition to install the OS more than the minimally required size.
- If you select "Use Existing Partition" at "System Partition", the information included in the first partition (excluding maintenance partition) will all be formatted and deleted. The information included in the other partition will be retained. The figure below describes the partition which information will be deleted when maintenance partition exists.

First Partition <Maintenance Partition> Retained	Second Partition Deleted	Third Partition Retained	Fourth Partition Retained
--	--------------------------------	--------------------------------	---------------------------------

- You can not re-install the system with the existing partition that is upgraded to Dynamic Disk remained. Do not select "Use Existing Partition" at "System Partition".
- If you specify other than 4095 MB for the "Installing Partition", it is necessary to convert to NTFS.
- If "Use Existing Partition" at "System Partition" is selected but the partition other than the one to install Windows Server 2003 does not exist (excluding maintenance partition), Express Setup will reserve the maximum area of the hard disk to install Windows Server 2003.
- You cannot go to the next screen if the specification is incorrect.
- To specify the setup parameters, the number of characters must not exceed the limit as shown in the table below. (Double-byte character is counted as 2 characters.)

Table 4: Setup Parameters Maximum Length

Item	Value specified	Max number of characters
Create Users	User Name	19
	Group Name	20
	Full Name	63
	Explanation	47
Create Groups	Group Name	20
	Explanation (Group Name)	47


 Note:

- If you press the F9 key in [Role of Computer], the installation will be done using the default values of Express Setup for the settings afterwards automatically. (Only when the [OK] button is displayed in the right side of the screen).
 - If you click [Cancel] in [Basic Information] screen, the screen will go back to select the Setup File. [Cancel] exists only in [Basic Information] screen.
-

Once all the specifications are reviewed, the system reboots.

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

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

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

- 12.** Follow the message and take the ExpressBuilder CD-ROM and Configuration Diskette out of the optical device drive, and insert Windows Server 2003 CD-ROM into the optical device drive.
[Software License Agreement] screen appears.
- 13.** Read the contents carefully and click [I agree.] or press **F8** if you do agree. If you do not agree, click [I disagree] or press **F3**.

 **Caution**

- 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.
-

- 14.** If you selected [Yes] on [Apply Service Pack] during Basic Information, remove the Windows Server 2003 CD-ROM and insert the Windows Server 2003 Service pack 1 CD-ROM in the optical disc drive when prompted to do so.

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

 **Note:** About MegaRAID Storage Manager (hereinafter, referred to as "MSM")

When the LSILogic MegaRAID SAS 8408E board is connected, Windows Server 2003 Service Pack 1 or later is necessary to install MSM. When you try to install MSM, and the setting of whether to apply Service Pack is [No], the following message will be displayed during the Express Setup.

Service Pack 1 or later is necessary to continue the installation of MSM (MegaRAID Storage Manager).

Apply the Service Pack?

* If you click [No], Windows Server Service pack 1 and MSM will be installed.

If you click [YES], Windows Server 2003 Service Pack 1 and MSM will be installed.

If you click [NO], MSM will not be installed. If you change the setting of whether to apply Service Pack or not by this message after you agreed the Software License Agreement, this change (the setting of whether to install MSM and Service Pack or not) is not reflected in the parameter file.

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

15. Microsoft Windows Server 2003 R2 only:

Insert Microsoft Windows Server 2003 R2 Standard Edition DISC 2 or Microsoft Windows Server 2003 R2 Enterprise Edition DISC 2 into the CD-ROM drive after the OS installation, and follow the on-screen instructions.

Once the installation is completed, remove Microsoft Windows Server 2003 R2 Standard Edition DISC 2 or Microsoft Windows Server 2003 R2 Enterprise Edition DISC 2 from the optical disc drive, and restart the system.

The Setup using Express Setup has completed.

Installing and Setting Device Drivers

Follow these steps to install and configure the device drivers.

PROSet

PROSet is a utility that verifies the function of network contained in network driver.

Using PROSet enables the following items:

- Verify detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.

■ Setup of teaming.

Configuring several network adapters as one team provides the server a tolerant environment on any trouble and enhance throughput between the switches.

PROSet is necessary to utilize these features.

1. Insert the ExpressBuilder CD-ROM into the optical device drive.
2. The [Windows Explorer] dialog starts.
 - * Procedure with the standard start menu
Click Start menu and click [Windows Explorer].
 - * Procedure with the classic start menu
Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "DXSETUP.EXE" in the following directory.
DVD-ROM driveLetter:\WINNT\DOTNET\NS4\PROSet\2KXPWS03
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 "Complete" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.

Network Driver

Specify the details of network driver.

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

[When PROSet is not installed]

1. The [Local Area Connection Properties] dialog box is displayed.
 - * Procedure with the standard start menu
 - a. Click Start menu, click [Control Panel], click [Network Connections], and Click [Local Area Connection].
 - * Procedure with the classic start menu
 - a. Click Start menu, click [Settings] and click [Network Connections].
The [Network Connections] dialog box is displayed.
 - b. Right-click [Local Area Connection] and click [Properties] from pop-up menu.
2. Click [Configure].
The property dialog box for network adapter is displayed.


3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.
4. Click [OK] on the property dialog box for network adapter.

[When PROSet is installed]

1. The [Intel PROSet] dialog box appears.
 - * Procedure with the standard start menu
Click 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 with the classic start menu
 - a. Click Start menu, point to [Settings] and click [Control Panel].
 - b. Click [Administrative tools].
 - c. Click [Computer Management] and double click the [(Network Adapter Name)] in the Network Adapter list.
2. Click [(Network Adapter Name)] in the list.
3. Click the [Link] and specify the [Speed & Duplex] value the same as the value specified for HUB.
4. Click [Apply] and click [OK].

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

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

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

Optional Network Board Driver

If you want to use an optional Network Board (Gigabit adapter), the network driver will be installed automatically. Therefore, the driver attached to the Network board should not be used. If necessary, install the driver stored in ExpressBuilder CD-ROM.

When using 100BASE TX adapters:


"DVD-ROM drive Letter:\WINNT\DOTNET\NS4\PRO100\WS03XP2K"

When using 1000BASE T adapters:

"DVD-ROM drive Letter:\WINNT\DOTNET\NS4\PRO1000\WS03XP2K"

If the installation procedure is not clear, refer to the installation procedure described in the section "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] is displayed.

 *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] is displayed.
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 specify the correct path. See [“Optional Network Board Driver” on page 251](#).
7. Click [Next].
8. 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 transfers the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

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

This feature includes AFT feature.

Caution

- 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.
-

1. Open the Teaming Wizard.
 - * The procedure in the case of the standard start menu
Click 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.
 - * The procedure in the case of the classic start menu
 - a. Click Start menu, point to [Settings] and click [Control Panel].
 - b. Click [Administrative Tools].
 - c. Click [Computer Management] and double click the [(Network Adapter Name)] in the Network Adapter list.
2. Select [Teaming] tab and then check on [Team with other adapters] and click [New Team...].

The [New Team Wizard] dialog box appears. Click [Next]. (Specify a name for the team if it necessary.)

3. Select the adapters to include in the team.
4. Select "Adapter Fault Tolerance" or "Adaptive Load Balancing" and click [Next].
5. Check the adapter to join the team and click [Next].
6. Click [Finish].
7. The setup will go back to [Intel(R) PROSet for Wired Connections] dialog box, so click [OK].
8. Restart the system.

Graphics Accelerator Driver

The drivers for the graphics accelerator cards that are installed in the server will setup automatically.

Installing SCSI Controller Driver (Adaptec 29160, Adaptec 29320, LSI20320)

Update the drivers for your system using the ExpressBuilder CD-ROM shipped with your system.

The SCSI drivers will be installed automatically.

Installing a Disk Array Controller Driver (SecuRAID 114, SecuRAID 121)

To install these controllers on a system running under Windows Server 2003, connect the controller and take the following steps to install the driver:

1. Start [Device Manager] from [Start] menu → [Control Panel] → [Administrative Tools] → [Computer Management].
2. Double-click [LSI Logic Megaraid SCSI 320-1/2] which Device Manager lists.
3. Click the [Driver] tab and click [Update Driver...].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select the "Search for the best driver in these locations." and check the "Search removable media [floppy, CD-ROM...]" check box.
6. Insert "Windows Server 2003 OEM-DISK for ExpressBuilder" into the floppy disk drive, and click [Next]. The drivers are copied.
7. The [Completing the Hardware Update Wizard] dialog box appears. Click [Finish].

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

Many different switches will be available if you edit Boot.ini file. For the available switch options, refer to the following information:

- Microsoft Knowledge Base - Article ID: 833721

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

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

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

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

■ Microsoft Knowledge Base - 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 [Operating Systems] section in [Boot.ini] file, and then save it.

<Example of Boot.ini file>

```
[boot loader]
```

```
timeout=30
```

```
default=multi(0)disk(0)rdisk(0)partition(2)\WINDOWS
```


```
[operating systems]
```

```
multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003,  
Standard" /fastdetect
```

```
multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003,  
Standard, PAE" /fastdetect /PAE
```

```
C:\CMDCONS\BOOTSECT.DAT="Microsoft Windows Recovery Console" /  
cmdcons
```

This is the end of editing Boot.ini file.

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

Setting for Solving Problems

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

Memory Dump (Debug Information)

This section describes the procedures for collecting memory dump (debug information) in the server.

 **Caution**

- The staff of maintenance service representative is in charge of collecting memory dump. Customers need only to specify the memory dump.
 - If any trouble occur after specifying the process below, the message to inform that the system is in short of virtual memory may appear, but continue to start the system. If you restart the system in such case, memory dump may not be stored correctly.
-

Follow the procedure below to specify.:

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

 **Caution**

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 we recommend you specify "Kernel Memory Dump" instead.
- Specify the drive where there is a free area bigger than the size of "the memory capacity mounted on Express server + 1MB".
- If the memory size exceeds 2GB due to added memory, change the write debugging information to [Kernel Memory Dump] before adding the memory. The size of the specified debugging information (memory dump) also changes when adding memory. We recommend you check (and change, if applicable) the size of the empty space in the debugging information (memory dump) write destination drive.

Windows Server 2003 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 we recommend you specify "Kernel Memory Dump" instead.
- Specify the drive where there is a free area bigger than the size of "the memory capacity mounted on Express server + 12MB". (In case the memory capacity is more than 2GB, a free area of "2048+12MB" or more).

- If the memory size exceeds 2GB due to added memory, change the write debugging information to [Kernel Memory Dump] before adding the memory. The size of the specified debugging information (memory dump) also changes when adding memory. We recommend you check (and change, if applicable) the size of the empty space in the debugging information (memory dump) write destination drive.
-

4. Specify "Complete memory dump" and modify [Dump file:] in the [Write debugging information] group box.
e.g. Write the debug information in D drive in the file named MEMORY.DMP.
D:\MEMORY.DMP
5. Click [Settings] on the [Performance] group box.
The [Performance Options] window is displayed.
6. Click [Advanced] tab on the [Performance Options] window.
7. Click [Change] on the [Virtual memory] group box.
8. Modify [Initial Size] in the [Paging file size for selected drive] box to the value larger than [Recommended], and click [Set].

Caution

- 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.
It may be impossible to collect correct debugging information due to a virtual memory shortage if the paging file is insufficient, so we recommend you set a paging file large enough for the entire system.
 - For more information on "Recommended" value, see "Partition Size to be Created" described earlier.
 - In case the memory is expanded, re-specify the paging file to suit the new memory size.
-

9. A message prompting to restart the system may appear according to the modified specification. In such cases, restart the system.


Windows Dr. Watson

Windows Dr. Watson is a debugger for application errors. If any application error is detected, Dr. Watson diagnoses the server and logs diagnostic information (log).


Follow the procedure below and specify Dr. Watson to collect diagnostic information.:

1. Click [Run] on Start menu.
2. Type "drwtsn32.exe" in the [Open] box, and click [OK].
The [Dr. Watson for Windows] dialog box appears.

3. Specify the location to store the diagnostic information in the [Log File Path] box.
The diagnostic information will be stored with the file name "DRWTSN32.LOG".

 *Note: You cannot specify a network path. Specify a path on a local computer.*

4. Specify the location of crash dump file in the [Crash Dump] box.

 *Note: "Crash Dump File" is a binary file that can be read with Windows Debugger.*

5. Check the following check box on the [Option] box.

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

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

6. Click [OK].

Network Monitor

Using Network Monitor helps you to investigate and manage with network trouble. To use Network Monitor, you need to restart the system after the installation has completed, so we recommend to install Network Monitor before any network trouble may occur.

1. Point to [Settings] from Start menu and click [Control Panel].
The [Control Panel] dialog box is displayed.
2. Double-click [Add or Remove Programs].
The [Add or Remove Programs] dialog box is displayed.
3. Click [Add/Remove Windows Component].
The [Windows Components Wizard] dialog box is displayed.
4. Click [Management and Monitoring Tools], and 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 the optical device drive and click [OK].
8. Click [Finish] in the [Windows Component Wizard] dialog box.

9. Close the [Add or Remove Programs] dialog box.

10. Close the [Control Panel] dialog box.

To start Network Monitor, point to [Program] → [Administrative Tools] and click [Network Monitor].

For information on how to operate Network Monitor, refer to Online Help.

Installing Maintenance Utilities

Various maintenance utilities are contained in your ExpressBuilder CD-ROM. See [*“Appendix 7: Installing and Using Utilities” on page 294.*](#)

Updating the System - Installing Service pack

Warning

If you install from the Windows Server 2003 CD-ROM which contains Service Pack 1, you do not need to install the Service Pack 1 again.

Update the system in the situation below:

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

Log on to the system with the account that has administrative authority (e.g. Supervisor) and insert the ExpressBuilder CD-ROM into the optical device drive.

[Setup Software] in [Master Control Menu] screen is displayed, right-click the item. Click [Update the System] from the menu and the setup will start. Follow the on-screen instructions.

Making Backup Copies of System Information

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

Save the information after completing the system setup.

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

You can save the information by the following process.

1. Set the ExpressBuilder CD-ROM in the optical device drive and reboot the system.
2. Select [Tools].
3. Select [Off-line Maintenance Utility].
4. Select [System Information Management].
5. Insert a diskette in the floppy disk drive.
6. Select [Save].

Installing with the OEM-FD for Mass Storage Device

This section explains how to setup with the OEM-FD. You usually do not have to do as follows. If you want to install other boards by using a driver floppy disk, set the server as follows. Detailed information is provided in the manual of the mass storage device.

Installation of mass storage device not supported by ExpressSetup

If you would like to install the OS when the system has new mass storage device not supported by ExpressBuilder, you have to setup as follows.

1. Read the manual supplied with the mass storage device before setting the server.
2. If the mass storage device is disk array controller, configure the RAID system before running the ExpressBuilder.
3. Boot the system from ExpressBuilder CD-ROM.
4.
 - (a) When the message “Do you want to use the parameters file...” appears , select “Yes”.
 - (b) When the dialog of Disk array configuration appears, check “Use Existing Array”
 - (c) Check “Apply OEM-FD for Mass storage device”
5. Copy the driver for the mass storage device in the ExpressSetup.
6. Insert the FD attached the mass storage device into the FD drive.
7. Follow the on-screen instructions to continue the ExpressSetup.

Appendix 5: Installing Microsoft Windows Server 2003

This section describes the procedures for installing Windows Server 2003 without using the Express Setup tool.

Before Installing Windows Server 2003

Please read carefully the following information BEFORE beginning your Windows Server 2003 Installation.

Application of Service Pack

The ServicePack 1 is mandatory to use Windows Server 2003 with this equipment. When installing Windows Server 2003 R2, it is not necessary to apply Service Pack 1.

Updating System

If you change the configuration of the system, update your system with the ExpressBuilder CD-ROM delivered with your system.

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

If you want to leave the existing partition when installing the system on the hard disk upgraded to Dynamic Disk, note the following issue:

- Do not select the partition where the operating system had been installed as the partition to install the operating system newly.
- Select "Use the current File System" for the format of operating system partition.

Manual Installation when the Disk Array Controllers are Connected

If you keep the disk array controllers connected during the installation process, pop-up messages may appear. This does not affect the system behavior. Click [YES] and continue the installation.

Magneto-Optical 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

Do not connect such devices to the server before installing the operating system.

Floppy Disk Drive

No internal floppy disk drive is included in your system. Prepare an optional USB floppy disk drive if necessary.

Partition Size

The minimum size for the partition where 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

Size necessary to install the system=

2900 MB (Windows Server 2003 only)

3500 MB (Windows Server 2003 R2)

3500 MB (Windows Server 2003 + Service Pack 1)

4400 MB (Windows Server 2003 + Service Pack 1 CD-ROM)

Paging File Size (Recommended)= Mounted Memory Size × 1.5

Dump file Size= Mounted Memory Size + 12 MB

Application size = Required size

Caution

- 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.
It may be impossible to collect correct debugging information due to a virtual memory shortage if the paging file is insufficient, so we recommend you set a paging file large enough for the entire system.
 - The maximum paging file size which can be set on one partition is 4095 MB. If the above paging file size exceeds 4095 MB, specify 4095 MB for the paging file size.
 - The maximum dump file size for the system with more than 2 GB memory mounted is '2048 MB + 12 MB'.
 - If you install any application program or the like, add necessary space to the partition to install these programs.
-

For example, if the mounted memory size is 512 MB, the minimally required partition size will be calculated by the above formula as follows:

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

If the required partition size is larger than the size of a hard disk drive, we recommend you split the file across several disks.

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 Microsoft Windows Server 2003

You will need the following for the installation of the Windows Server 2003:

- ExpressBuilder CD-ROM
- Microsoft Windows Server 2003 Standard Edition (CD-ROM), Microsoft Windows Server 2003 Enterprise Edition (CD-ROM), Microsoft Windows Server 2003 R2 Standard Edition (CD-ROM), or Microsoft Windows Server 2003 R2 Enterprise Edition (CD-ROM).
- Microsoft Windows Server 2003 Service Pack (CD-ROM).
- User's Guide
- Getting Started
- Windows Server 2003 OEM-DISK for ExpressBuilder

Before installing, create Windows Server 2003 OEM-DISK for ExpressBuilder.

Creating "Windows 2003 OEM-DISK for ExpressBuilder"

You can create the Windows 2003 OEM-DISK for ExpressBuilder with the following two procedures:

Creating from the menu which appears when running BULL NovaScale Server with ExpressBuilder

Use this procedure if you have only the BULL NovaScale Server to create the Windows 2003 OEM-DISK for ExpressBuilder.

- If you have only the BULL NovaScale Server to create the Windows Server 2003 OEM-DISK for ExpressBuilder, use this procedure.
 1. Prepare a 3.5-inch floppy disks.
 2. Turn on your BULL NovaScale Server.
 3. Insert the ExpressBuilder CD-ROM in the optical device drive.
 4. Press **Ctrl + Alt + Delete** to reboot the server. (You may also turn off and then on again to reboot the server.)

The system will boot from the CD-ROM and the ExpressBuilder starts.
 5. Select [Create Support Disk] from [Tools].
 6. Select [Windows Server 2003 OEM-DISK for ExpressBuilder] from the [Create Support Disk] menu.
 7. Insert a diskette in the floppy disk drive according to the on-screen instruction. Windows Server 2003 OEM-DISK for ExpressBuilder will be created.
 8. Write-protect and label the diskette, then keep it in a safe place.

Creating Windows 2003 OEM-DISK from [Master Control Menu]

Use this procedure if Windows Server 2003 or Windows 2000 can be operated on BULL NovaScale Server.


[Master Control Menu] runs on the following operating systems.

- Windows Server 2003 x64
- Windows Server 2003
- Windows 2000
- Windows Me/98/95
- Windows NT 4.0
- Windows XP x64 Edition
- Windows XP

You can create the Windows Server 2003 OEM-DISK for ExpressBuilder from [Master Control Menu], if you have the computer on which one of the above operating system operates.

Follow the steps below:

1. Prepare a 3.5-inch floppy disks.
2. Run the operating system.
3. Insert the ExpressBuilder CD-ROM in the optical device drive.
[Master Control Menu] is displayed.
4. Click [Setup] with the left mouse button, click [Make OEM-DISK] and then [for Windows Server 2003].

 *Note: You can do the same operation using the menu displayed by 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.
6. Write-protect and label the diskette, then keep it safely.

Windows Server 2003 Clean Installation

This section explains how to perform a clean installation of Windows Server 2003.


1. Turn the system on.
2. Insert the Windows Server 2003 CD-ROM in the optical device drive.
3. Press **Ctrl + Alt + Delete** to reset the system.

After a bootable operating system has been installed on the hard disk, press **Enter** while the message "Press any key to boot from CD..." is displayed at the top of the screen.

If no bootable operating system exists on the hard disk, this step is unnecessary. The Windows Server 2003 setup screen will be displayed. If the screen is not displayed, **Enter** was not pressed properly.

Retry after turning the system off and then on again.

4. If a RAID or SCSI controller is installed, press **F6** in a few seconds when 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.

 *Note: There is no visible indication on screen when F6 has been pressed.*

5. When the following message is displayed, press **S**.

Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter. Currently, Setup will load support for the following mass storage devices.

The following message is then displayed.

Please inert the disk labeled
manufacturer-supplied hardware support disk
into Drive A:
*Press ENTER when ready.

6. Insert the Windows Server 2003 OEM-DISK for ExpressBuilder into the floppy drive, and press **Enter**.
A list of mass storage devices is displayed.
7. Select the [LSI Logic Fusion-MPT SAS Driver (Server 2003 32-bit)] and press **Enter**.
8. Select the driver according to your configuration (embedded or external adapter), and follow the on-screen instructions.
9. When prompted to do so, press **Enter** to start the "Welcome to Setup" wizard. Once the installation of Windows Server 2003 is finished, the system reboots automatically.
 - Windows Server 2003: go to step 13.
 - Windows Server 2003 R2: go to step 10.
10. The [Windows Setup] screen will be displayed once logged on to the system.



Caution

- In some cases, the [Windows Setup] screen may not be displayed. However, make sure to install Microsoft Windows Server 2003 R2 DISC 2 according to the following procedures.
- Make sure you install Microsoft Windows Server 2003 R2 DISC 2 after the application of "System update". In this case, note that the [Windows Setup] screen is not displayed.

11. Insert Microsoft Windows Server 2003 R2 DISC 2 CD-ROM into the DVD-ROM drive. Confirm the parameters and click [OK].
12. When the installation has completed, remove Microsoft Windows Server 2003 R2 DISC 2 CD-ROM from the DVD-ROM drive, and restart the system.
13. Once the installation is completed, execute the tasks described in [“Driver Installation and Device Settings” on page 271](#) and [“Updating System” on page 261](#).

Reinstallation to Multiple Logical drives

This section describes the procedure for reinstalling the operation system if the multiple logical drives exist.

Before Re-installing the Operation System

Be sure to make backup copies before re-installing the operation system just in case.

Re-installing the Operation System

1. Start the clean installation following the procedure described in this guide.
2. Specify the partition in which you want to install the operating system when the following message appears:

The following list shows the existing partitions and unpartitioned space on this computer.

Use the UP and DOWN ARROW keys to select an item in the list.

* Cannot modify the drive letter of your system or boot volume. Confirm the proper drive letter is assigned and then, continue the setup.

3. Continue the clean installation following the procedure described earlier in this chapter.
 - * The drive letter of the re-installed system may differ from the one of the previous system. If you need to modify the drive letter, follow the procedure "Modifying the Drive Letter".

Modifying the Drive Letter

Be careful that the drive letter of the system or boot volume cannot be modified with the following procedure.

1. Click Start menu, right-click [My Computer], and specify [Manage] to start [Computer Management].
2. Specify the [Disk Management] in the left side of the window.
3. Right-click the volume for which you want to modify the drive letter and specify the [Change Drive Letter and Path...].
4. Click [Yes].
5. Choose the [Assign a drive letter] and specify the drive letter you want to assign.
6. Click [OK].
7. If the following message appears, click [Yes]:

Changing the drive letter of a volume may cause programs to no longer run.
Are you sure you want to change this drive letter?

8. Close the [Computer Management].

Updating the System

To ensure normal system operation you should update your system using the following procedures.

1. Logon to the system using the administrator account or other account which is a member of the Administrators group.
2. Insert the ExpressBuilder CD-ROM into the optical device drive.
[Master Control Menu] is displayed on the screen.
3. Click [Setup] with the left mouse button and click U [Update BULL NovaScale system] section.
4. Follow the on-screen instructions to continue system update.
5. Click [OK] to restart the system.
6. Remove the ExpressBuilder CD-ROM from the optical device drive immediately after clicking [OK].

Caution

If you change the configuration of the system (by adding or removing hardware or Operating system software components) or repair the system, you must run the system update again.

Driver Installation and Device Settings

This section describes how to install and setup various standard drivers mounted on the device.

For information on installing and setting up a driver that is not described in this section, please refer to the document delivered with the driver.

PROSet

PROSet is a utility that checks the function of network contained in the network driver.

Using PROSet enables the following items:

- Verify detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Setup of teaming.

Configuring several network adapters as one team provides the server a tolerant environment on any trouble and enhance throughput between the switches.

PROSet is necessary to use these features.

To install PROSet:

1. Insert the ExpressBuilder CD-ROM into the optical device drive.
2. The [Windows Explorer] dialog starts.
 - a. In the case of the standard start menu, click Start menu and click [Windows Explorer].
 - b. In the case of the classic start menu, click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "DXSETUP.exe" in the following directory:
<DVD-ROM driveLetter>:\WINNT\DOTNET\NS4\PROSet\2KXPWS03
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 "Complete" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.

Network Driver

Specify the details of network driver.

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

[When PROSet is not installed]

1. The [Local Area Connection Properties] dialog box is displayed.


- Procedure with the standard start menu: click Start menu, [Control Panel], [Network Connections], and [Local Area Connection].
- Procedure with the classic start menu:
 - a. Click Start menu, Click [Settings] and Click [Network Connections]. The [Network Connections] dialog box is displayed.
 - b. Right-click [Local Area Connection] and click [Properties] from pop-up menu.
- 2. Click [Configure].
The property dialog box for the network adapter is displayed.
- 3. Click [Advanced] and specify the same value for [Link Speed & Duplex] and for the HUB.
- 4. Click [OK] on the property dialog box for network adapter.

[When PROSet is installed]

1. The [Intel PROSet] dialog box appears.
 - * Procedure with the standard start menu
Click 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 with the classic start menu
 - a. Click Start menu, point to [Settings] and click [Control Panel].
 - b. Click [Administrative tools].
 - c. Click [Computer Management] and double click the [(Network Adapter Name)] in the Network Adapter list.
2. Click [(Network Adapter Name)] in the list.
3. Click [Speed] and specify the same value for [Link Speed & Duplex] and for the HUB.
4. Click [Apply] and click [OK].

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

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

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

Re-install the Network Driver

The network driver will be installed automatically.

Graphics Accelerator Driver

The drivers for the graphics accelerator cards that are installed in the server will setup automatically.

If you remove an additional graphics card, make sure to remove its corresponding driver.

Should it be necessary to install manually the drivers, follow the procedure below.

If you want to use an optional graphics accelerator card, setup the card according to what is written in the card's documentation.

1. Insert the ExpressBuilder CD-ROM into the DVD-ROM drive.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer]
3. Run "SETUP.EXE" in the following directory.
To install a standard graphics accelerator driver:
<DVD-ROM drive Letter>:\WINNT\DOTNET\VIDEO\MATROX/SETUP.EXE
To install a graphics accelerator (N8105-45) driver:
<DVD-ROM drive Letter>:\WINNT\DOTNET\VIDEO\ES1000/SETUP.EXE
4. Follow the on-screen instructions to continue the installation. If a message "Digital signature could not be found" appears, select *Yes* to continue.
5. Remove the ExpressBuilder CD-ROM from the DVD-ROM drive, follow the on-screen directions and restart the system.

Installing SCSI Controller Drivers

Update the drivers for your system using the ExpressBuilder CD-ROM shipped with your system.

The SCSI drivers will be installed automatically.

Installing a Disk Array Controller Driver (SecuRAID 114, SecuRAID 121)


To install these controllers on a system running under Windows Server 2003, connect the controller and take the following steps to install the driver:

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

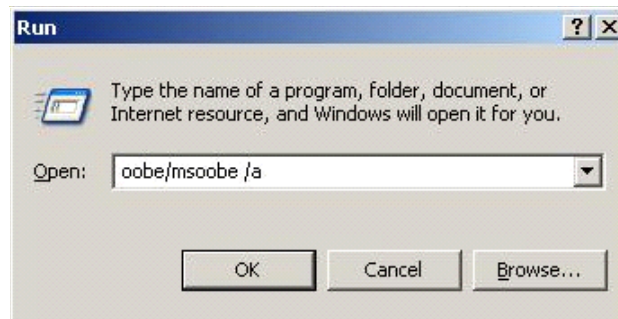
2. Double-click [LSI Logic Megaraid SCSI 320-1/2] which Device Manager lists.
3. Click the [Driver] tab and click [Update Driver...].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select the "Search for the best driver in these locations." and check the "Search removable media [floppy, CD-ROM...]" check box.
6. Insert "Windows Server 2003 x64 OEM-DISK for ExpressBuilder" into the floppy disk drive, and click [Next].The drivers are copied.
7. The [Completing the Hardware Update Wizard] dialog box appears. Click [Finish].

About Windows Activation

Windows Server 2003 must be activated before you can use Windows Server 2003. Please follow the process described below.

 **Note:** The activation process is not required for Windows Server 2003 R2.

1. Click [Run] on [Start] menu.
Type as follows in the [Open:] box, and click [OK].
oobe/msoobe /a



- Click on [Next] when prompted to do so on the following screen.



The following screen is displayed.



- 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 features more than 4GB of memory, adding /PAE switch in Boot.ini file will enable the system to be recognized 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 [Operating Systems] section in [Boot.ini] file, and then save it.

<Example of Boot.ini file>

```
[boot loader]
```

```
timeout=30
```

```
default=multi(0)disk(0)rdisk(0)partition(2)\WINDOWS
```


```
[operating systems]
```

```
multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003" /  
fastdetect
```

```
multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003, PAE"  
/fastdetect /PAE
```

```
C:\CMDCONS\BOOTSECT.DAT="Microsoft Windows Recovery Console" /  
cmdcons
```

This is the end of editing Boot.ini file.

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

Setting for Collecting Memory Dump (Debug Information)

Set for collecting memory dump using the procedure described in the corresponding Appendix.

Appendix 6: Installing Microsoft Windows Server 2003 x64 Editions

This section describes the procedures for installing 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 beginning your Windows Server 2003 x64 Editions Installation.

Installing Service Pack

You can install the Service Pack on the server. If the Service Pack is not attached to your system, prepare it yourself.

Updating System

If you change the configuration of the system, update your system with the ExpressBuilder CD-ROM delivered with your system.

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

If you want to leave the existing partition when installing the system on the hard disk upgraded to Dynamic Disk, note the following issue:

- Do not select the partition where the operating system had been installed as the partition to install the operating system newly.
- Select "Use the current File System" for the format of operating system partition.

Manual Installation when the Disk Array Controllers are Connected

If you keep the disk array controllers connected during the installation process, pop-up messages may appear. This does not affect the system behavior. Click [YES] and continue the installation.

Magneto-Optical 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

Do not connect such devices to the server before installing the operating system.

Floppy Disk Drive

No internal floppy disk drive is included in your system. Prepare an optional USB floppy disk drive if necessary.

Partition Size

The minimum 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= 4100 MB

Paging File Size (Recommended)= Mounted Memory Size × 1.5

Dump file Size= Mounted Memory Size + 1 MB

Application Size = Required Size

Caution

- 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.
It may be impossible to collect correct debugging information due to a virtual memory shortage if the paging file is insufficient, so we recommend you set a paging file 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 install any application program or the like, add necessary space to the partition to install these programs.
-

For example, if the mounted memory size is 512 MB, the minimal size of the partition will be calculated by the above formula as follows:

$4100 \text{ MB} + (512 \text{ MB} * 1.5) + (512 \text{ MB} + 1 \text{ MB}) + \text{Application Size} = 5381 \text{ MB} + \text{Application Size}$

If the required partition size is larger than the size of a hard disk drive, we recommend you split the file across several disks.

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 Microsoft Windows Server 2003 x64 Editions

You will need the following for the installation of the Windows Server 2003 x64 Editions:

- ExpressBuilder CD-ROM
- Microsoft Windows Server 2003 R2 Standard x64 Edition (CD-ROM) / Microsoft Windows Server 2003 R2 Enterprise x64 Edition (CD-ROM)
- User's Guide
- Getting Started
- Windows Server 2003 x64 Editions OEM-DISK for ExpressBuilder

Before installing, create Windows Server 2003 x64 Editions OEM-DISK for ExpressBuilder.

Creating "Windows 2003 x64 Editions OEM-DISK for ExpressBuilder"

You can create the Windows 2003 x64 Editions OEM-DISK for ExpressBuilder using one of the following two procedures:

Creating from the menu which appears when running BULL NovaScale Server with ExpressBuilder

Use this procedure if you have only the BULL NovaScale Server to create the Windows 2003 OEM-DISK for ExpressBuilder.

- If you have only the BULL NovaScale Server to create the Windows Server 2003 x64 Editions OEM-DISK for ExpressBuilder, use this procedure.
 1. Prepare a 3.5-inch floppy disks.
 2. Turn on your BULL NovaScale Server.
 3. Insert the ExpressBuilder CD-ROM in the optical device drive.
 4. Press **Ctrl + Alt + Delete** to reboot the server. (You may also turn off and then on again to reboot the server.)

The system will boot from the CD-ROM and the ExpressBuilder starts.
 5. Select [Create Support Disk] from [Tools].
 6. Select [Windows Server 2003 x64 Editions OEM-DISK for ExpressBuilder] from the [Create Support Disk] menu.
 7. Insert a diskette in the floppy disk drive according to the on-screen instruction. Windows Server 2003 x64 Editions OEM-DISK for ExpressBuilder will be created.
 8. Write-protect and label the diskette, then keep it in a safe place.

Creating Windows 2003 OEM-DISK from [Master Control Menu]

Use this procedure if Windows Server 2003 x64 Editions or Windows 2000 can be operated on BULL NovaScale Server.


[Master Control Menu] runs on the following operating systems.

- Windows Server 2003 x64 Editions
- Windows Server 2003
- Windows 2000
- Windows Me/98/95
- Windows NT 4.0
- Windows XP x64 Edition
- Windows XP

You can create the Windows Server 2003 x64 Editions OEM-DISK for ExpressBuilder from [Master Control Menu], if you have the computer on which one of the above operating system operates.

Follow the steps below:

1. Prepare a 3.5-inch floppy disks.
2. Run the operating system.
3. Insert the ExpressBuilder CD-ROM in the optical device drive.
[Master Control Menu] is displayed.
4. Click [Setup] with the left mouse button, click [Make OEM-DISK] and then [for Windows Server 2003 x64].

 **Note:** You can do the same operation using the menu displayed by a right-click.

5. Insert the floppy disk into the floppy disk drive according to the message.
Windows Server 2003 x64 Editions OEM-DISK for ExpressBuilder will be created.
6. Write-protect and label the diskette, then keep it safely.

Windows Server 2003 x64 Editions Clean Installation

This section explains how to perform a clean installation of Windows Server 2003 x64 Editions.


1. Turn the system on.
2. Insert the Windows Server 2003 x64 Editions CD-ROM in the optical device drive.
3. Press **Ctrl + Alt + Delete** to reset the system.

After a bootable operating system has been installed on the hard disk, press **Enter** while the message "Press any key to boot from CD..." is displayed at the top of the screen.

If no bootable operating system exists on the hard disk, this step is unnecessary. The Windows Server 2003 x64 Editions setup screen will be displayed. If the screen is not displayed, **Enter** was not pressed properly.

Retry after turning the system off and then on again.

4. If a RAID or SCSI controller is installed, press **F6** in a few seconds when 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.

 **Note:** There is no visible indication on screen when F6 has been pressed.

5. When the following message is displayed, press **S**.

Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter. Currently, Setup will load support for the following mass storage devices.

The following message is then 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 Editions OEM-DISK for ExpressBuilder into the floppy drive, and press **Enter**.
A list of mass storage devices is displayed.
7. Select the [LSI Logic Fusion-MPT SAS Driver (Server 2003 x64)] and press **Enter**.
8. Select the driver according to your configuration (embedded or external adapter).
9. When prompted to do so, press **Enter** to start the "Welcome to Setup" wizard. Once the installation of Windows Server 2003 x64 Edition is finished, the system reboots automatically.
10. The [Windows Setup] screen will be displayed once logged on to the system.



Caution

- In some cases, the [Windows Setup] screen may not be displayed. However, make sure to install Microsoft Windows Server 2003 R2 DISC 2 according to the following procedures.
- Make sure you install Microsoft Windows Server 2003 R2 DISC 2 after the application of "System update". In this case, note that the [Windows Setup] screen is not displayed.

11. Insert Microsoft Windows Server 2003 R2 x64 Edition DISC 2 CD-ROM into the DVD-ROM drive. Confirm the parameters and click [OK].
12. When the installation has completed, remove Microsoft Windows Server 2003 R2 x64 Edition DISC 2 CD-ROM from the DVD-ROM drive, and restart the system.

Reinstallation to Multiple Logical drives

This section describes the procedure for reinstalling the operation system if the multiple logical drives exist.

Before Re-installing the Operation System

Be sure to make backup copies before re-installing the operation system just in case.

Re-installing the Operation System

1. Start the clean installation following the procedure described in this guide.
2. Specify the partition in which you want to install the operating system when the following message appears:

The following list shows the existing partitions and unpartitioned space on this computer.

Use the UP and DOWN ARROW keys to select an item in the list.

* Cannot modify the drive letter of your system or boot volume. Confirm the proper drive letter is assigned and then, continue the setup.

3. Continue the clean installation following the procedure described earlier in this chapter.
 - * The drive letter of the re-installed system may differ from the one of the previous system. If you need to modify the drive letter, follow the procedure "Modifying the Drive Letter".

Modifying the Drive Letter

Be careful that the drive letter of the system or boot volume cannot be modified with the following procedure.

1. Click Start menu, right-click [My Computer], and specify [Manage] to start [Computer Management].
2. Specify the [Disk Management] in the left side of the window.
3. Right-click the volume for which you want to modify the drive letter and specify the [Change Drive Letter and Path...].
4. Click [Yes].
5. Choose the [Assign a drive letter] and specify the drive letter you want to assign.
6. Click [OK].
7. If the following message appears, click [Yes]:

Changing the drive letter of a volume may cause programs to no longer run.
Are you sure you want to change this drive letter?

8. Close the [Computer Management].

Updating the System

To ensure normal system operation you should update your system using the following procedures.

1. Logon to the system using the administrator account or other account which is a member of the Administrators group.
2. Insert the ExpressBuilder CD-ROM into the optical device drive.
[Master Control Menu] is displayed on the screen.
3. Click [Setup] with the left mouse button and click U [Update BULL NovaScale system] section.
4. Follow the on-screen instructions to continue system update.
5. Click [OK] to restart the system, and immediately remove the ExpressBuilder CD-ROM from the optical device drive.

Caution

If you change the configuration of the system (by adding or removing hardware or Operating system software components) or repair the system, you must run the system update again.

Driver Installation and Device Settings

This section describes how to install and setup various standard drivers mounted on the device.

For information on installing and setting up a driver that is not described in this section, please refer to the document delivered with the driver.

PROSet

PROSet is a utility that checks the function of network contained in the network driver.

Using PROSet enables the following items:

- Verify detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Setup of teaming.

Configuring several network adapters as one team provides the server a tolerant environment on any trouble and enhance throughput between the switches.

PROSet is necessary to use these features.

To install PROSet:

1. Insert the ExpressBuilder CD-ROM into the optical device drive.
2. The [Windows Explorer] dialog starts.
 - c. In the case of the standard start menu, click Start menu and click [Windows Explorer].
 - d. In the case of the classic start menu, click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "PROSet.exe" in the following directory:
<DVD-ROM driveLetter>:\WINNT\W2K3AMD\NS4\PROSet\WS03_32E
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 "Complete" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.

Network Driver

Specify the details of network driver.

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

IP addresses cannot be set when the "Internet Protocol (TCP/IP)" check box is OFF. Check ON the "Internet Protocol (TCP/IP)" check box to be able to set IP addresses.

[When PROSet is not installed]


1. The [Local Area Connection Properties] dialog box is displayed.
 - Procedure with the standard start menu: click Start menu, [Control Panel], [Network Connections], and [Local Area Connection].
 - Procedure with the classic start menu:
 - a. Click Start menu, Click [Settings] and Click [Network Connections]. The [Network Connections] dialog box is displayed.
 - b. Right-click [Local Area Connection] and click [Properties] from pop-up menu.
2. Click [Configure].
The property dialog box for the network adapter is displayed.
3. Click [Advanced] and specify the same value for [Link Speed & Duplex] and for the HUB.
4. Click [OK] on the property dialog box for network adapter.

*[When PROSet is installed]***[When PROSet is installed]**

1. The [Intel PROSet] dialog box appears.
 - * Procedure with the standard start menu
Click 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 with the classic start menu
 - a. Click Start menu, point to [Settings] and click [Control Panel].
 - b. Click [Administrative tools].
 - c. Click [Computer Management] and double click the [(Network Adapter Name)] in the Network Adapter list.
2. Click [(Network Adapter Name)] in the list.
3. Click the [Link] and specify the [Speed & Duplex] value the same as the value specified for HUB.
4. Click [Apply] and click [OK].

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

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

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

5. Check the [Include this location in the search] check box and specify the correct path. See [“Check the \[Include this location in the search\] check box and specify the correct path. See .” on page 289.](#)
6. Click [Next].
7. Click [Finish].

Re-install the Network Driver

The network driver will be installed automatically.

Optional Network Board Driver

If you want to use an optional Network Board (Gigabit adapter), the network driver will be installed automatically. Therefore, the driver attached to the Network board should not be used. If necessary, install the driver stored in ExpressBuilder CD-ROM.

When using 100BASE TX adapters:

"DVD-ROM drive Letter:\WINNT\W2K3AMD\NS4\PRO100\WS3XPX64"


When using 1000BASE T adapters:

"DVD-ROM drive Letter:\WINNT\W2K3AMD\NS4\PRO1000\WS3XPX64"

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

Installing the Optional Network Board Driver

1. Start Device Manager.
2. Click [Network adapters] and double-Click [(Network Adapter Name)]. [(Network Adapter Name) Properties] is displayed.

 *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] is displayed.
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 specify the correct path. See [“Optional Network Board Driver” on page 289](#).
7. Click [Next].
8. 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 transfers the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

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

This feature includes AFT feature.

Caution

- 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.
-

If you want to use AFT/ALB feature:

1. Open the Teaming Wizard.
 - * The procedure in the case of the standard start menu
Click 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.
 - * The procedure in the case of the classic start menu
 - a. Click Start menu, point to [Settings] and click [Control Panel].
 - b. Click [Administrative Tools].
 - c. Click [Computer Management] and double click the [(Network Adapter Name)] in the Network Adapter list.
2. Select [Teaming] tab and then check on [Team with other adapters] and click [New Team...].

The [New Team Wizard] dialog box appears. Click [Next]. (Specify a name for the team if it necessary.)

3. Select the adapters to include in the team.
4. Select "Adapter Fault Tolerance" or "Adaptive Load Balancing" and click [Next].
5. Check the adapter to join the team and click [Next].
6. Click [Finish].
7. The setup will go back to [Intel(R) PROSet for Wired Connections] dialog box, so click [OK].
8. Restart the system.

Graphics Accelerator Driver

The drivers for the graphics accelerator cards that are installed in the server will setup automatically.

If you remove an additional graphics card, make sure to remove its corresponding driver.

Should it be necessary to install manually the drivers, follow the procedure below.

If you want to use an optional graphics accelerator card, setup the card according to what is written in the card's documentation.

1. Insert the ExpressBuilder CD-ROM into the DVD-ROM drive.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer]
3. Run "SETUP.EXE" in the following directory.
To install a standard graphics accelerator driver:
<DVD-ROM drive Letter>:\WINNT\W2K3AMD\VIDEO\MATROX/
SETUP.EXE
To install a graphics accelerator ATI RN50 driver:
<DVD-ROM drive Letter>:\WINNT\W2K3AMD\VIDEO\ES1000/
SETUP.EXE
4. Follow the on-screen instructions to continue the installation. If a message "Digital signature could not be found" appears, select *Yes* to continue.
5. Remove the ExpressBuilder CD-ROM from the DVD-ROM drive, follow the on-screen directions and restart the system.

Installing SCSI Controller Drivers

Update the drivers for your system using the ExpressBuilder CD-ROM shipped with your system.

The SCSI drivers will be installed automatically.

Installing a Disk Array Controller Driver (SecuRAID 114, SecuRAID 121)

To install these controllers on a system running under Windows Server 2003, connect the controller and take the following steps to install the driver:

1. Start [Device Manager] from [Start] menu → [Control Panel] → [Administrative Tools] → [Computer Management].
2. Double-click [LSI Logic Megaraid SCSI 320-1/2] which Device Manager lists.
3. Click the [Driver] tab and click [Update Driver...].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select the "Search for the best driver in these locations." and check the "Search removable media [floppy, CD-ROM...]" check box.
6. Insert "Windows Server 2003 x64 OEM-DISK for ExpressBuilder" into the floppy disk drive, and click [Next]. The drivers are copied.
7. The [Completing the Hardware Update Wizard] dialog box appears. Click [Finish].

Setting for Collecting Memory Dump (Debug Information)

Set for collecting memory dump using the procedure described in the corresponding section.

Appendix 7: Installing and Using Utilities

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

ExpressBuilder

ExpressBuilder is an automated software integration tool that helps simplify the process of installing and configuring your server. It provides a flexible, guided installation process for system administrators to install Microsoft® Windows Server(TM) 2003.

To install other operating systems, please contact your service representative for the server certified operating systems.


 *Note: Before using ExpressBuilder for initial setup, complete the hardware configuration.*

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

■ DOS-based with local console

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



 *Note: When using ExpressBuilder with the remote KVM console, the mouse does not work. use a keyboard.*

■ **DOS-based with remote console**

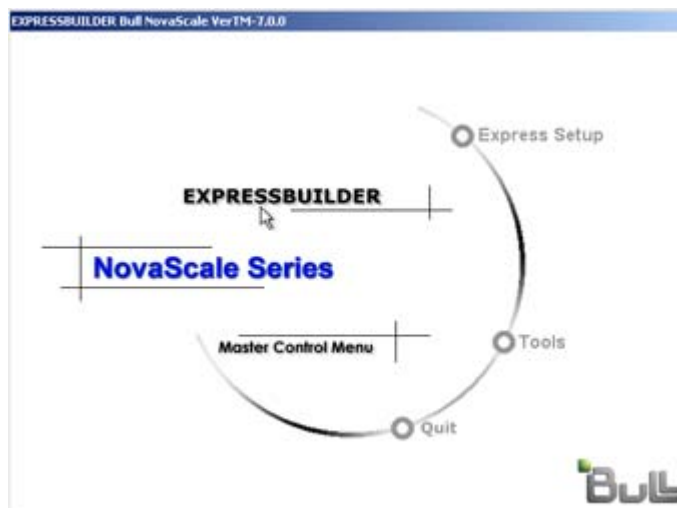
Used to set up the server from the management workstation by accessing the server over the network or via serial port B.

 *Note:*

- *Before using ExpressBuilder for initial setup, complete the hardware configuration.*
 - *This menu is displayed only when an optional remote management card is installed in your system.*
 - *No keyboard connected to the server is permitted to run this program.*
-

■ **Windows-based**

This program is called as "Master Control Menu" that can run under the Microsoft Windows system (Windows 95 or later and Windows NT 4.0 or later). You can install the several applications and read the documentation from the menu.



ExpressBuilder for DOS-Based with Local Console

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

Starting ExpressBuilder

The following procedure instructs you to start ExpressBuilder.

Caution

Do not remove the ExpressBuilder CD-ROM while ExpressBuilder is running.

1. Turn on peripheral devices and the server in this order.
2. Insert the ExpressBuilder CD-ROM supplied with your server into the optical disc drive of your server.
3. Ensure that the floppy disk drive is empty.
4. Press the RESET switch or press **Ctrl, Alt, and Delete** to reboot from the ExpressBuilder. (You may also turn off and then on again to reboot the server.) ExpressBuilder boots up displaying the top menu.



DOS-Based ExpressBuilder Menus

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

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

Caution

- The Express Setup is intended for the initial setup of the server system and, therefore, the Express Setup clears the contents of the hard disk.
 - Once Express setup is started, do not remove "Configuration Diskette" from the floppy disk drive without any directions.
 - Express Setup does not support the installation of Windows Server 2003 x64 Editions
-

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

Table 5: Tools Menu

Save/Restore RAID Configuration Data	RAID Board: None
Changing the settings of the Disk Array Controller (0ch)	Server Management Board: None
Off-line Maintenance Utility	None
System Diagnostics	System Configuration: None
Create Support Disk	
Setup Maintenance Partition	
BIOS/FW/etc. Update	
System Management	
Help	
Return to the Top Menu	

■ **Save/Restore RAID Configuration Data**

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

- **Save Disk Array Configuration Data**

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

Warning

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

- Restore Disk Array Configuration Data

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

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

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


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

Warning

- Some Disk Array Controllers do not support this function. In that case, this menu will not be shown.
 - Please do not use this function, except for maintenance.
-

- Changing the Settings of the Disk Array Controller (0ch)

You can change the settings of the Disk Array Controller (0ch).

 *Note: The system is automatically rebooted when you change the settings.*

- Off-line Maintenance Utility

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

- System Diagnostics

Executes various tests on the server system to check if the server functions are normal and if the connection between the server and additional board is normal.

After the System Diagnostics is executed, a system check program assigned to each model starts.

- Create Support Disk

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

Use this menu to create a support disk by copying from the ExpressBuilder CD-ROM. If your system is running a Windows operating system, you may find it more convenient to use ExpressBuilder for Windows-based to make support disks

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

- Windows Server 2003 x64 Editions OEM-DISK for ExpressBuilder

Creates a support disk used for the installation of Windows Server 2003 x64 Editions.

- Windows Server 2003 OEM-DISK for ExpressBuilder

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

- ROM-DOS Startup FD

Creates a support disk used to start the ROM-DOS system.

- Off-line Maintenance Utility Bootable FD

Creates a support disk used to activate the Off-line Maintenance Utility.

■ Setup Maintenance Partition

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

Warning

- Do not reset or turn off the server while running this menu. If this process is interrupted, the system will not start anymore.
- The existence of the maintenance partition may be identified from the operating system. In order to retain the Configuration Data, do not delete the partition.

Notes:

- *The maintenance partition, once created, cannot be recreated again.*
 - *When the maintenance partition does not exist, some menu items do not appear.*
-

- Create Maintenance Partition

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

- Install Maintenance Partition Utilities

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

- Update Maintenance Partition Utilities

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

- FDISK

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

■ System Management

The parameters of the Baseboard Management Card (BMC) are set for remote control and alert.

■ BIOS/FW/etc. Update

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

Warning

Do not turn off the server while the update program is running. If this process is interrupted, the system will not start anymore.

■ Help

Displays explanations about various functions of ExpressBuilder.

■ Return to the Top Menu

Choosing this menu returns to the Top Menu.

ExpressBuilder for DOS-based with Remote Console

This subsection describes the procedures necessary to use ExpressBuilder for DOS-based with remote console.

ExpressBuilder contains the remote console feature that allows the system administrator to set up the server from the management workstation (management PC) via the network or the server's COM B (serial) port.

 **Warning**

- Do not use this feature on any other computer than the server, or on any other server obtained without Express-Builder. Doing so may cause a failure of the server.
 - To use the remote console feature, a floppy disk containing a configuration information file named "CSL_LESS.CFG" must be inserted in the floppy disk drive. If "CSL_LESS.CFG" is not found in floppy disk, no menu is displayed on the management PC.
 - If you fail to configure the disk array controller from the remote console, try again using the server console.
 - The system may fail to operate with the transfer rate of 115.2 Kbps for serial console redirection. Specify any other transfer rate than 115.2 Kbps.
-

Starting


The following two methods are available to start the server.

- Running ExpressBuilder from the management PC via LAN
- Running ExpressBuilder from the management PC via direct connection (COM B)

For the procedure for starting ExpressBuilder for DOS-based with Remote Console, see "NEC DianaScope".

 **Warning**

- Do not change the boot device order in BOOT menu in BIOS SETUP. ExpressBuilder cannot be used if the DVD-ROM drive is not the first boot device.
 - To use the remote console feature, a floppy disk containing a configuration information file must be inserted in the floppy disk drive. You can create a configuration information file by using System Management feature in the Tools menu or by NEC DianaScope Configuration menu. The configuration information file must be named as "CSL_LESS.CFG" and stored in the root directory of the floppy disk.
-

 *Notes: The following items of BIOS setup information will be set as shown below.*

- LAN Controller:[Enabled]

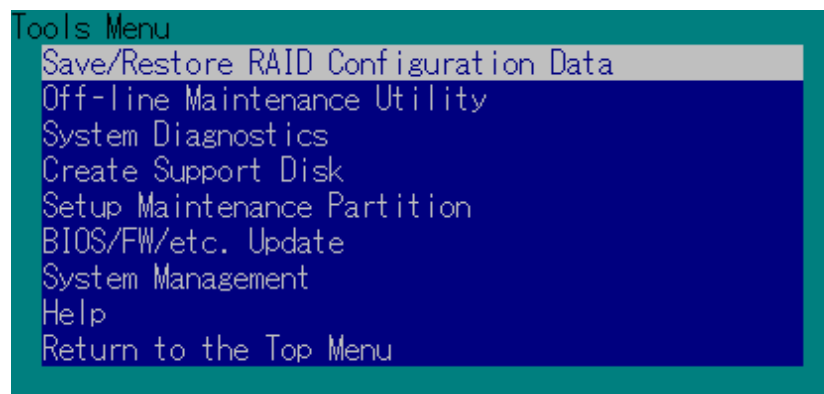
- *Serial Port A:[Enabled]*
Base I/O Address:[3F8]
Interrupt:[IRQ 4]
 - *Serial Port B:[Enabled]*
Base I/O Address:[2F8]
Interrupt:[IRQ 3]
 - *BIOS Redirection Port:[Serial B]*
 - *Baud Rate:[19.2K]*
 - *Flow Control:[CTS/RTS]*
 - *Console Type:[PC ANSI]*
-

Top menu items are listed below:

- **Setup:** automatically sets up the server.
- **Tools:** launch the features of ExpressBuilder individually.
- **Help:** help message on ExpressBuilder.
- **Quit:** quit ExpressBuilder.

ExpressBuilder checks the hardware configuration of the server. The disk array and maintenance partition are automatically configured.

When you select the [Tools] on the Top Menu, the following screen appears.



The menu items available only in remote console operation among those described in section "ExpressBuilder for DOS-based with Local Console" are displayed. See the previous subsection for detailed explanation of menu items.

Warning

The following differs from the [Tools] menu in the local console mode.

- Test items and operation method of System Diagnostics.
-

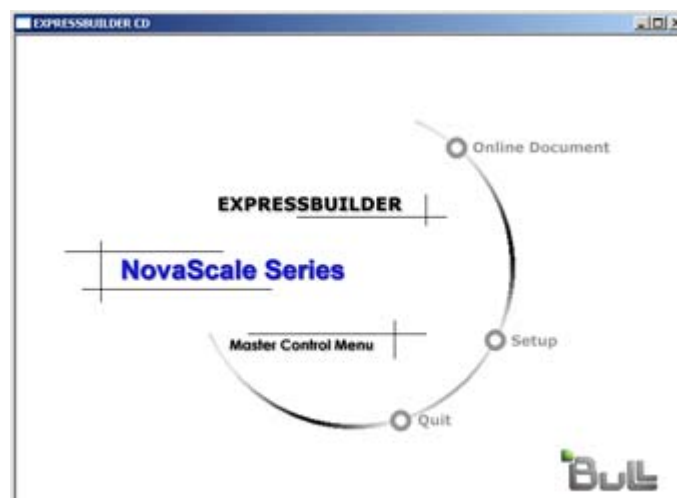
ExpressBuilder for Windows-Based (Master Control Menu)

The Master Control Menu is used to,

- Read the User's Guide or the other documents,
- Update the BULL NovaScale system, and
- Install the management software.

Notes:

- *Master Control Menu requires Microsoft Windows 95 (or later) or Windows NT 4.0 (or later).*
 - *Some documents are provided in the PDF format. Use the Adobe Acrobat Reader to read these documents.*
-



Insert the ExpressBuilder CD-ROM into the DVD-ROM drive, the Master Control Menu appears on the screen automatically. If the Autorun function is invalid in your system, run the \MC\1ST.EXE file in the CD-ROM directly. Some items are grayed-out when the logon user does not have administrator authority, or if the item is not proper for the system.

To use Master Control Menu,

- Click on [Online Document], [Setup] or [Quit], or
- Click the right mouse button on Master Control Menu window.

Configuration Diskette Creator

"Configuration Diskette Creator" is a tool used to create the [Configuration Diskette] that is used for configuring the server with the Express Setup.

If you use the Configuration Diskette created by the Express Setup and Configuration Diskette Creator to operate the setup, you can automatically setup the OS and several utilities, except for a few key inputs required to confirm the specification.

If needed, you can also re-install the system with the same specification. We recommend you to create a [Configuration Diskette] to setup the servers.


Caution

You cannot create a [Configuration Diskette] for Microsoft Windows server 2003 x64 Editions.

 *Note: You can install Windows Server 2003 and Windows 2000 without a [Configuration Diskette]. Also, you can modify/newly create the [Configuration Diskette] during the setup with ExpressBuilder.*


Creating Configuration Diskette

This section describes how to specify setup information required for OS installation and the creation of the [Configuration Diskette]. Follow the procedure below.

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

1. Start the OS.

2. Insert the ExpressBuilder CD-ROM into the DVD-ROM drive.
3. Click [Setup] on the Master Control Menu.
4. Click [Configuration Diskette Creator].
5. Click [Create New Information files] from the [File] menu.
6. Specify each item and click [OK].
7. Follow the on-screen instructions to specify each item on the dialog box and click [Next].

 **Note:** If you click on [Cancel], all the values already entered will be deleted.

Once you have finished completing the specification of setup information, the [Save Setup Information] dialog box will appear.

8. Make sure that the [Configuration Diskette] check box is checked, and type a file name for the Setup File in [File Name].
9. Insert a 1.44MB floppy disk into the floppy disk drive and click [OK].


The [Configuration Diskette] is created; we recommend you label it and store it in a safe place. Use it to install Windows Server 2003 or Windows 2000.

If you want to modify an existing information file, click [Modify Information Files] on the Configuration Diskette Creator Window. Refer to the Help file for more information.

Installing Optional Mass Storage Driver

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

1. Display the Configuration Diskette Creator window.
2. From the [File] menu, click [Create new information files].
3. Specify each item and click on [OK].
4. Follow the message to specify each item on the dialog box and click on [Next].


 **Note:** If you click on [Cancel], all the values already entered will be deleted.

5. When [User and application setup] is displayed, check [Apply OEM-FD for mass storage device].
6. When the [Save Setup Information] dialog box is displayed, confirm that the [Configuration Diskette] check box is checked, and input file name for the Setup File in [File Name].
7. Insert a 1.44MB floppy disk into the floppy disk drive and click [OK].

NEC ESMPRO

NEC ESMPRO lets a system administrator manage remote servers across a network. NEC ESMPRO monitors server hardware and software configurations, failures, and performance.


Using the log data collected by NEC ESMPRO, a system administrator can track long-term and short-term performance, monitor server usage, create graphs to record trends, and check server failure rates. The administrator can use the information collected to create more efficient data routing procedures and optimize the server usage.

 **Note:** For installation procedure and detailed explanations on NEC ESMPRO, refer to the online documentation provided on the ExpressBuilder CD-ROM.

Functions and Features

NEC ESMPRO offers many functions and features for managing remote servers across a network. These features help the system administrator perform daily system operation, system extension, and transfer tasks. Some features of NEC ESMPRO Manager include:

- Hardware and software server configuration
 - Hardware resources mounted in servers, such as the CPU, memory, disks, disk arrays, and LAN boards.
 - Software resources, such as operating system information and the drivers running on each server.
- Server failures
 - On-screen real-time displays provide the system administrator with the failure type, location, cause, and suggested corrective action.
 - Failure data includes hardware failure information such as motherboard temperature, memory failure, crashes, and software failure information.
- Performance
 - NEC ESMPRO monitors server performance and displays server usage on the screen and displays information, such as the rate of CPU load, memory usage, disk usage, and LAN traffic. Usage threshold values can help the system administrator monitor and prevent server overloads.

 **Note:** For the installation procedure and detailed explanations on NEC ESMPRO, refer to the online documentation provided on the ExpressBuilder CD-ROM.

Power Console Plus

Power Console Plus is a utility used to control the RAID system of the disk array controllers (SecuRAID) produced by LSI Logic.

Using Power Console Plus enables operations (e.g., monitoring and maintenance) of RAID systems that are constructed on local Express servers and Express servers connected through networks (TCP/IP). The operations can be done online on graphical screens without the system being stopped.

Major Functions

Power Console Plus provides the following features:

- Support for the Wizard function in order to facilitate configuration
- Makes it possible to change of RAID levels
- Compatible with SAF-TE
- Performance monitor support
- Supports enclosure functions such as temperature monitoring, power monitoring, and fan monitoring
- Enables the settings of Write, Read, and Cache policies for each logical drive
- Supports the save and restore functions for configuration
- Enables the display of the SCSI transfer rate

Components

Power Console Plus consists of the following five components:

- **SNMP Agent (not supported)**
- **MegaRAID Service Monitor**
Enables NEC ESMPRO to monitor the SecuRAID controller by registering event logs. Install MegaRAID Service Monitor in the Express server in which the SecuRAID controller is mounted.
- **MegaRAID Client**
Controls the RAID system on graphical screens. Install MegaRAID Client in the Express server in which the SecuRAID controller mounted or in the management PC that is connected through the Express server and network.
- **MegaRAID Server**
Enables control of the SecuRAID controller via the network. Install MegaRAID Server in the Express server in which the SecuRAID controller mounted.
- **MegaRAID Registration Server**

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

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

■ Server (Express server in which the SecuRAID controller is mounted):

Install the following three components in this server:

- MegaRAID Service Monitor
- MegaRAID Server
- MegaRAID Client

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

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

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

Install the following component in this PC:

- MegaRAID Client

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

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

- MegaRAID Registration Server

Server Setup

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

Operating Environment

■ Hardware

- Machine: BULL NovaScale series connected with the AMI disk array controller (A)
- Memory: Size large enough for OS operation + 8MB or more
- Free space of the hard disk: 5MB or more
- Display unit: Screen size 1024 × 768 or larger

- Required peripheral equipment: Network Interface card, CD-ROM unit, Pointing device such as a mouse
- Software
 - Microsoft Windows Server 2003
 - Microsoft Windows Server 2003 R2
 - Microsoft Windows 2000
 - Microsoft Windows XP

Management PC Setup

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

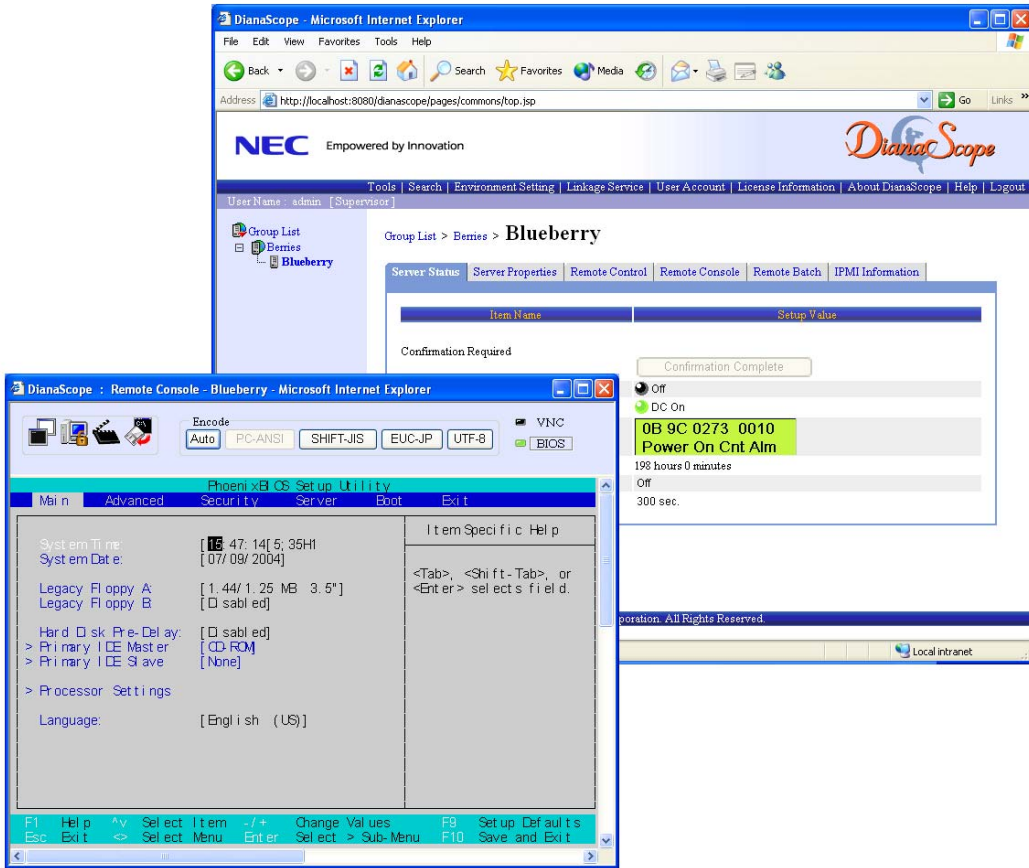
Operating Environment


- Hardware
 - Machine: BULL NovaScale series, PC/AT-compatible machine (which contains Intel Pentium or a CPU at least equivalent to it)
 - Memory: Size large enough for OS operation + 8MB or more
 - Free space of the hard disk: 5 MB or more
 - Display unit: Screen size 1024 × 768 or larger
 - Required peripheral equipment: Network Interface card, CD-ROM unit, Pointing device such as a mouse
- Software
 - Microsoft Windows NT version 4.0 (Windows NT version 4.0 Service Pack 6a + Internet Explorer 5.5 ou ultérieur)
 - Microsoft Windows 2000
 - Microsoft Windows XP
 - Microsoft Windows 2003
 - Microsoft Windows 2003 R2

NEC DianaScope

NEC DianaScope is a software used for the remote management of the BULL NovaScale series.

See the online documents for details on the functions and installation of NEC DianaScope.



 *Note: You need the server license to activate NEC DianaScope for this product.*

MegaRAID Storage Manager™ (Server)

MegaRAID Storage Manager™ (hereinafter abbreviated to MSM) is the application used to manage or monitor the LSI Logic embedded or additional controllers. You can use MSM for management of arrays and error notification by event monitoring while the system is running.

Before attempting to operate MSM, read the "MegaRAID Storage Manager™ User's Guide" included in ExpressBuilder CD-ROM. The manual explains the MSM installation procedure and notes on operating MSM.

Setup with Express Setup

You can install MSM with Express Setup contained in the ExpressBuilder CD-ROM. When you start the Express Setup, a dialog to specify an application appears. Select [MSM] on the dialog.

Manual Setup

See the online document "MegaRAID Storage Manager™ User's Guide" contained in ExpressBuilder CD-ROM for details.

Appendix 8: Product Configuration Record Table

Use these tables to record pertinent information about your system. You will need some of this information to run the System Setup Utility. Be sure to update these tables when you add options.

Record the model and serial numbers of the system components, dates of component removal or replacement, and the name of the vendor from whom the component was purchased. Be sure to record the same information for any components added to the system, such as a power supply, hard disk drives, add-in boards, or printers.

Record the model and serial numbers of the unit and motherboard. The model and serial numbers of the system unit are recorded on a label attached to the rear of the unit.

The location of serial numbers on add-in boards, hard disk drives, and external equipment, such as video displays or printers, varies from one manufacturer to another. Literature accompanying these products should illustrate or describe the location of model and serial numbers.

Table 6: Hardware Product Configuration Record Table

Main Unit						
	Model name		Serial No.		Date Installed	
CPU						
#1	Clock		Serial No.		Date Installed	
#2	Clock		Serial No.		Date Installed	
Memory						
#11	Size		Serial No.		Date Installed	
#12	Size		Serial No.		Date Installed	
#13	Size		Serial No.		Date Installed	
#21	Size		Serial No.		Date Installed	
#22	Size		Serial No.		Date Installed	
#23	Size		Serial No.		Date Installed	
#31	Size		Serial No.		Date Installed	
#32	Size		Serial No.		Date Installed	
#33	Size		Serial No.		Date Installed	
#41	Size		Serial No.		Date Installed	
#42	Size		Serial No.		Date Installed	
#43	Size		Serial No.		Date Installed	
Monitor						
	Type		Model name		Serial No.	
					Date Installed	
Hard disk drive						

Table 6: Hardware Product Configuration Record Table (Continued)

Bay #1	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Bay #2	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Bay #3	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Bay #4	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Bay #5	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Bay #6	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Bay #7	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
Bay #8	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
5.25-inch Device						
Slot 1	Type		Model name	Serial No.		
				Date Installed		
Slot 2	Type		Model name	Serial No.		
				Date Installed		
Slot 3 (Standard optical disc drive)	Type		Model name	Serial No.		
				Date Installed		
PCI Slot #1						
	Model name			Serial No.		
				Date installed		
PCI Slot #2						
	Model name			Serial No.		
				Date installed		
PCI e Slot #3						
	Model name			Serial No.		
				Date installed		
PCI e Slot #4						
	Model name			Serial No.		
				Date installed		
PCI e Slot #5						

Table 6: Hardware Product Configuration Record Table (Continued)

	Model name				Serial No.	
					Date installed	
PCI e Slot #6						
	Model name				Serial No.	
					Date installed	
Printer						
	Model name				Serial No.	
	Manufacturer				Date installed	
Additional Cabinet for Disk						
	Model name				Serial No.	
					Date installed	
External Peripheral Device 1						
	Model name				Serial No.	
	Manufacturer				Date installed	
External Peripheral Device 2						
	Model name				Serial No.	
	Manufacturer				Date installed	
External Peripheral Device 3						
	Model name				Serial No.	
	Manufacturer				Date installed	
External Peripheral Device 4						
	Model name				Serial No.	
	Manufacturer				Date installed	

Table 7: Software Product Configuration Record Table

Firmware version			
OS		Name:	Version:
Application of RUR media	Apply	Name:	Version:
File system	FAT	HPFS	
	NTFS	Others	
Bundled software installed			
Licensed software installed			
Application running when a failure occurred			
Remarks			

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