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Text Conventions

This guide uses the following text conventions.


Warnings, cautions, and notes have the following meanings:

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.

 **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 upper case 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 system board 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 R440 server. Its goal is to familiarize you with your server and the tasks necessary for server configuring and upgrading.

- Chapter 1 contains information about the front, back and internal features of your server and about the motherboard. It lists the features of your server and provides details about the ExpressBuilder CD-ROM.
- Chapter 2 helps you installing the server in a rack assembly and 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 options.
- Chapter 4 provides the information to remove components from your server 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 issues you may encounter with your server. This chapter contains information about the status indicators of your server.

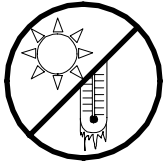
Related Documents

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 server.



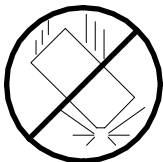
Protect the server from extremely low or high temperatures. Let the server warm (or cool) to room temperature before using it.



Keep the server away from magnetic forces.



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



Protect the server from being bumped or dropped.



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



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

System Overview

The Bull NovaScale R440 server is a modular, multiprocessing server based on the Intel® Xeon™ microprocessor. It is a solid performer and offers the latest technology. The combination of compute performance, memory capacity, and integrated I/O provides a high performance environment for many server market applications. These range from large corporations supporting remote offices to small companies looking to obtain basic connectivity capability such as file and print services, e-mail, web access, web site server, etc.

The Bull NovaScale R440 server is housed and available as a rack-mount system. Your server conveniently installs into a standard EIA 19-inch rack assembly.

Your server includes a DVD-ROM drive and three hard disk drive bays (SAS or SATA). The hot-swap hard disk drive bays support 1.0-inch hard disk drives that can be swapped in or out of the server without powering it down, if the RAID functionality is configured in the server.

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

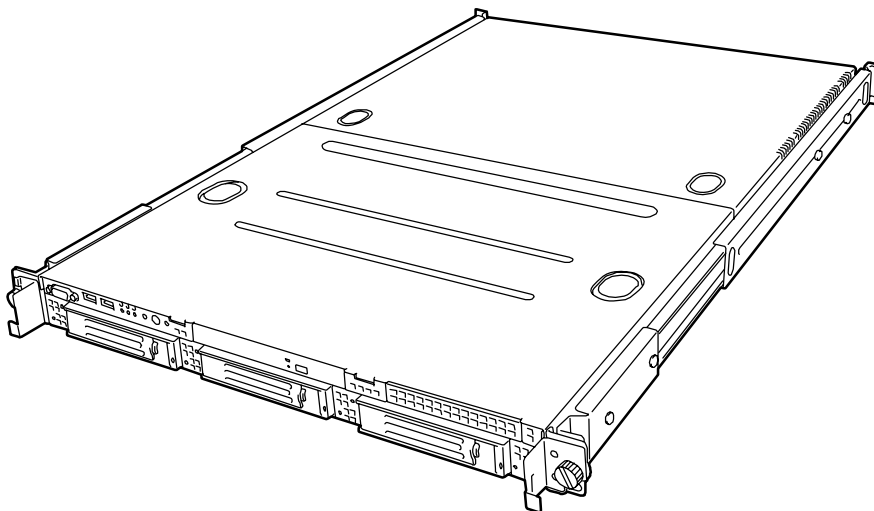


Figure 1: Bull NovaScale R440

Server Chassis

External View

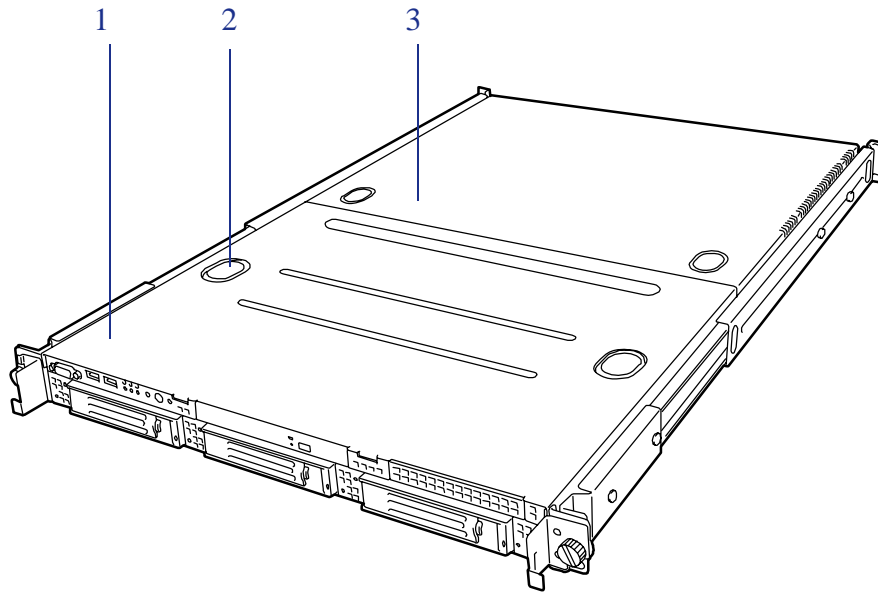


Figure 2: External View

- 1** Drive cover
- 2** Release button
- 3** Logic cover

Front View with Front Bezel Closed

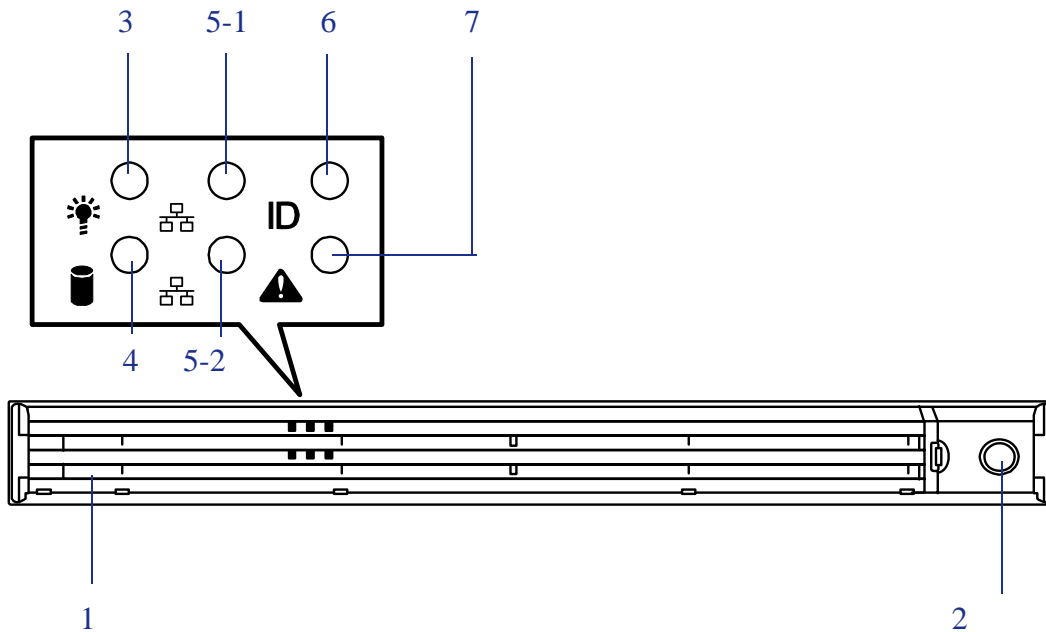


Figure 3: Front View with Front Bezel Closed

- 1 Front bezel**
The front bezel is a cover protecting the front devices during daily operation. A security key is provided to lock the cover.
- 2 Key slot**
Insert the security key into this slot when unlocking the front bezel.
- 3 Power lamp (green)**
This lamp turns green when the power is turned on.
- 4 Disk access lamp (green/amber)**
This lamp is green during access to the internal hard disks. The lamp turns amber when even one of the internal hard disks fails.
- 5 ACT lamp (green)**
This lamp lights while the server is connected to the network. 5-1 is for LAN port 1 and 5-2 is for LAN port 2.
- 6 UID lamp (blue)**
This lamp goes on when the UID switch is pressed. The lamp also goes on or flashes when software issues a command.
- 7 Status lamp (green/amber)**
This lamp indicates the server status. The lamp is green during normal operation. The lamp turns amber or flashes when the server enters the abnormal state.

Front View with Front Bezel Removed

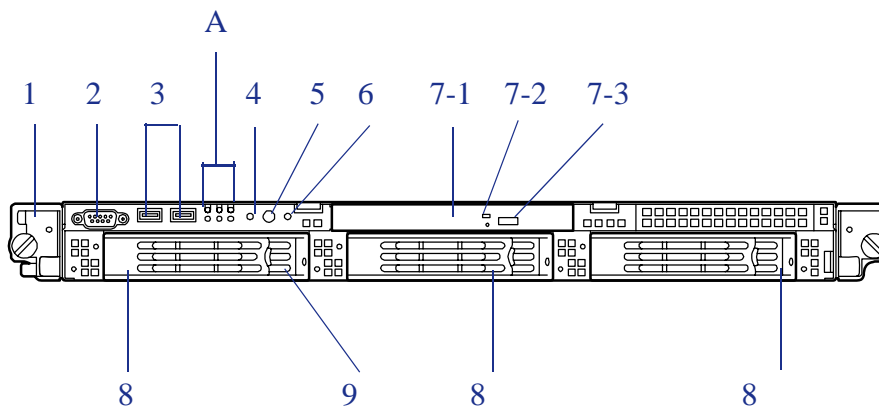


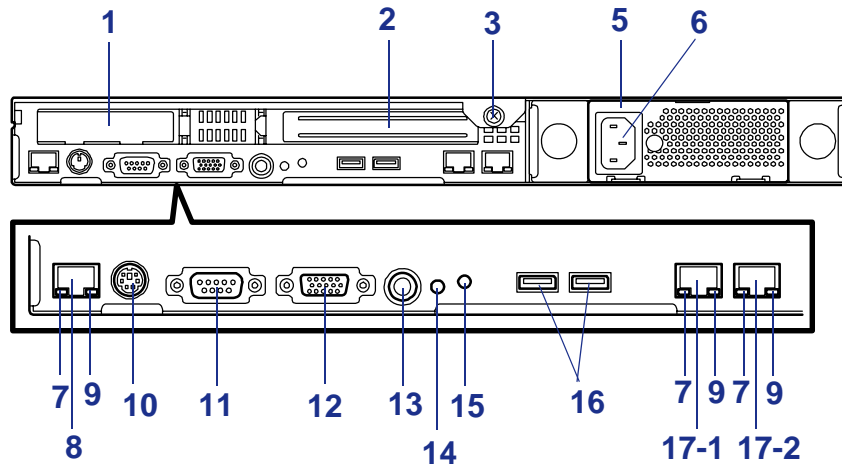
Figure 4: Front View with Front Bezel Removed

A - Status indicators 3 to 7 on [Figure 3: Front View with Front Bezel Closed](#)

- 1 Handle (1 at the right and left each)**
Hold the handles when dismounting/mounting the server from/in the rack.
- 2 Serial port B (COM B) connector**
Connect a personal computer having a serial interface to this management port.
- 3 USB connectors (2 ports)**
Connect device compliant with the USB interface to the connectors.
- 4 Dump (NMI) switch**
Press this switch to dump server memory.
- 5 Power switch**
Press this switch to turn on/off the power.
Pressing the switch once turns on the power: The power lamp lights.
Pressing it again to turn off the power.
Pressing the switch for more than 4 seconds forcibly turns off the power.
- 6 UID (Unit ID) switch**
Press this switch to turn on/off the UID lamps on the front and rear panels of the server.
Pressing the switch once turns on the lamps.
Pressing it again turns them off.
- 7 Optical device drive**
7-1 Disk access lamp 7-2 Tray eject button 7-3 Emergency hole
- 8 Hard disk bays**
Mount hard disks in the bays.
In the standard configuration, hard disk drive trays are mounted in all the bays.
- 9 Hard disk lamp (green/amber)**
Each hard disk lamp is green during access to the hard disk.
The lamp turns amber when the hard disk fails.
The lamp flashes switching back and forth between green and amber during build processing (in only disk array configuration).

Rear View

SATA hot-swap hard disk drive model



SAS hot-swap hard disk drive model

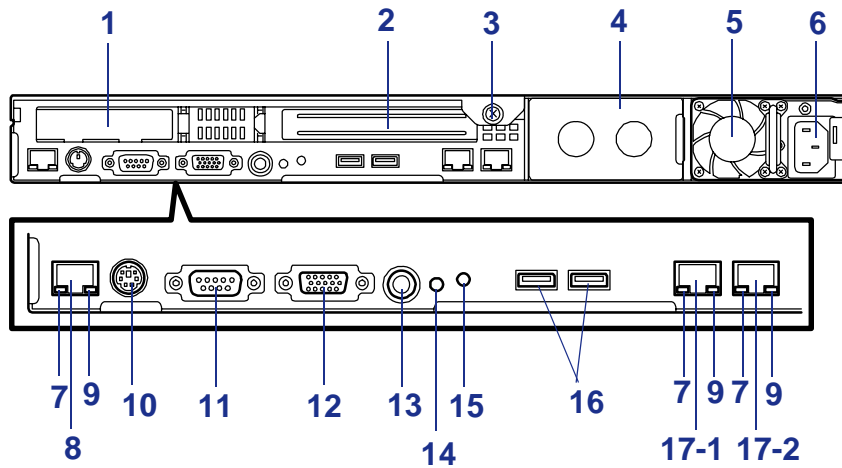


Figure 5: Rear View

- 1 Low-profile PCI board extension slot (1C)**
Mount PCI board of the low-profile type into this slot.
- 2 Full-height PCI board extension slots (1B)**
Mount PCI board of the full-height type in the slot.
- 3 Captive thumbscrew**
Secures the logic cover to the chassis.
- 4 Redundant power supply slot**
Hot-swap SAS hard disk drive model only
An optional slot for 1+1 redundant power configuration.
- 5 Power supply**
Supplies DC power to the server.
- 6 AC inlet**
Connect the power cord to this socket.
- 6 Redundant power supply slot**
An optional slot for 1+1 redundant power configuration.
- 7 LINK/ACT lamp (green)**
This lamp indicates the access status of the LAN.
- 8 Management LAN port**
100BASE-TX/10BASE-T interface port used to manage the server via LAN.
- 9 Speed lamp (amber)**
This lamp indicates the transmission speed of the LAN.
- 10 Mouse/keyboard connectors**
Connect the mouse and keyboard to the connectors through the provided relay cables.
- 11 Serial port A (COM A) connector**
Connect device having a serial interface to this connector.
A leased line cannot be connected to this connector.
- 12 Monitor connector**
Connect the display unit to this connector.
- 13 UID switch**
Press this switch to turn on/off the UID lamps on the front and rear panels of the server.
Pressing the switch once turns on the lamps.
Pressing it again turns them off.
- 14 DUMP (NMI) switch**
Press this switch to dump system memory.
- 15 UID lamp (blue)**
This lamp goes on when the UID switch is pressed or when a software issues such a command.
- 16 USB connector**
Connect device compliant with the USB interface to this connector.
- 17 LAN connectors**
Connect network systems on the LAN to the connectors. The number "1" following the bold-faced number indicates LAN port 1, and the number "2" indicates LAN port 2.

RJ45 Leds

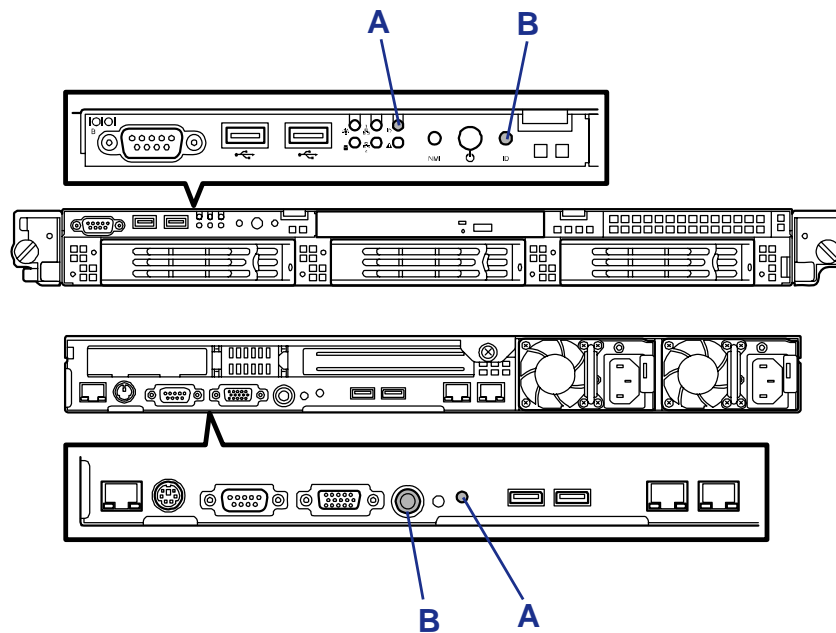
Refer to [*"LAN Connector Lamps" on page 191*](#) for more information.

Identification of Servers ~ UID Switch ~

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

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

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



Internal View (SATA model)

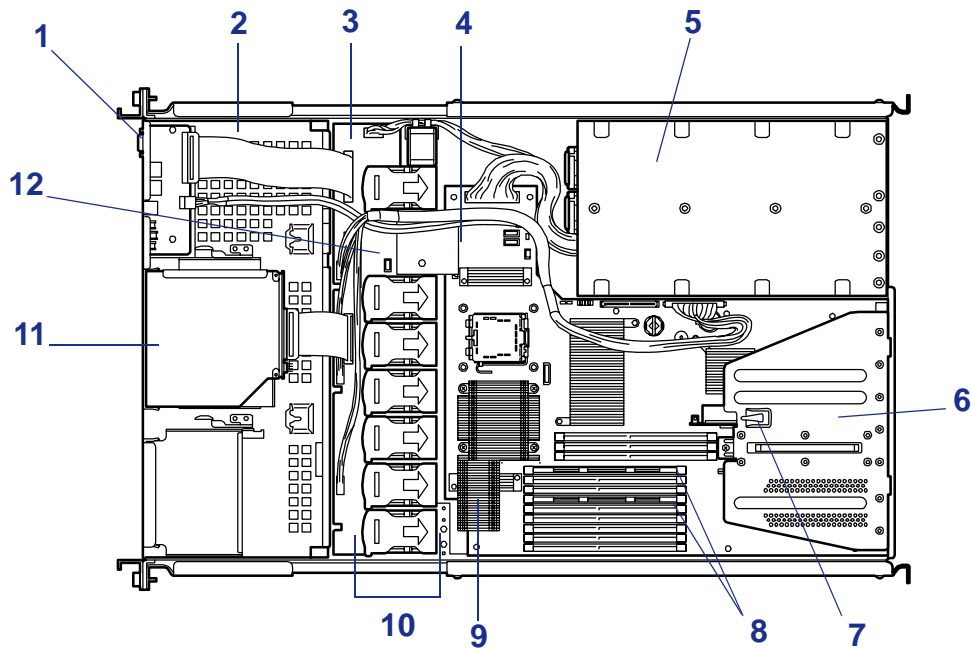


Figure 6: Internal View

- 1 Front panel board
- 2 Hard disk drive bays
- 3 Backplane
- 4 Motherboard
- 5 Power supply
- 6 Riser card module assembly
- 7 Chassis intrusion switch
- 8 DIMMs
- 9 Processor (mounted under the CPU and heatsink)
- 10 Cooling fans
- 11 DVD-ROM drive
- 12 DAC LED pin header

Internal View (SAS model)

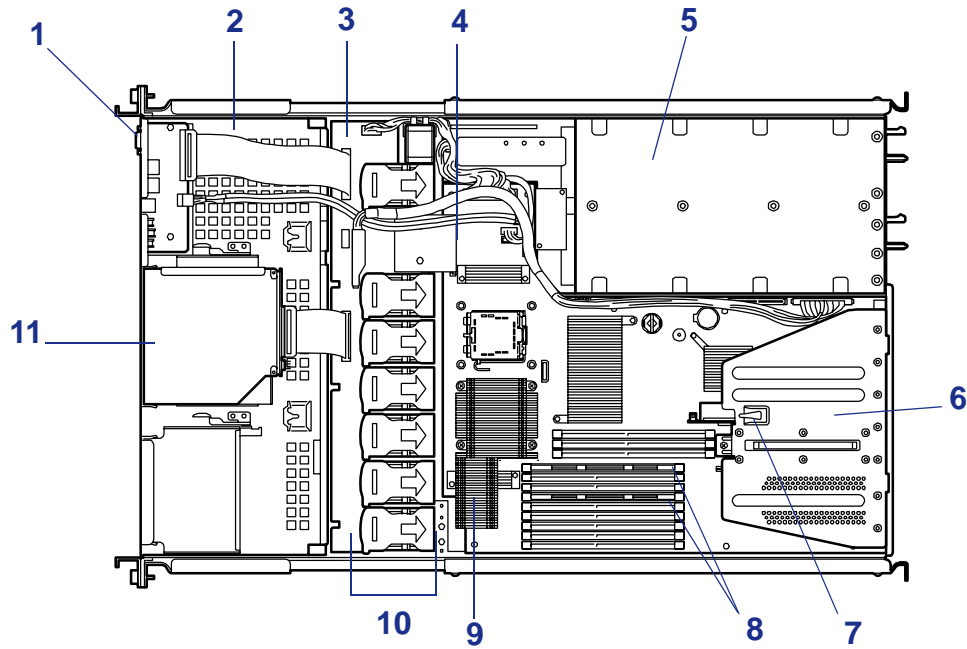


Figure 7: Internal View

- 1 Front panel board
- 2 Hard disk drive bays
- 3 Backplane
- 4 Motherboard
- 5 Power supply
- 6 Riser card module assembly
- 7 Chassis intrusion switch
- 8 DIMMs
- 9 Processor (mounted under the CPU and heatsink)
- 10 Cooling fans
- 11 DVD-ROM drive

System board Features

Motherboard

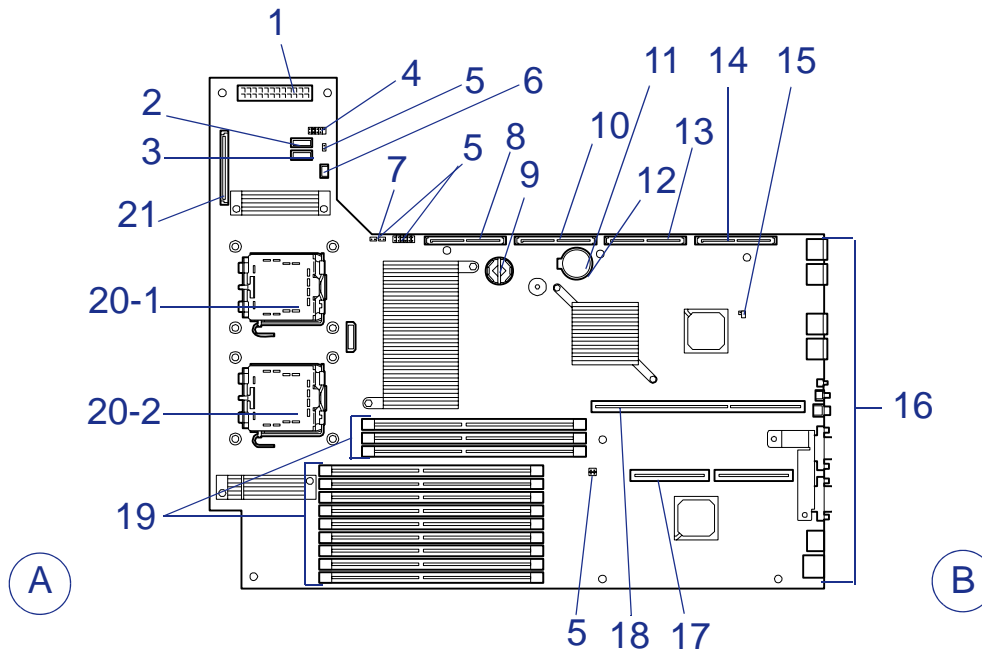


Figure 8: Motherboard

- A** Front side
- B** Rear side
- 1** Main power connector
- 2** USB file device connector
- 4** USB connector
- 5** Configuration jumpers
- 6** Connectors
- 7** Password clear jumper switch
- 8** SATA Connector 2 - SATA hard disk drive model only (not used)
- 9** RAID socket (reserved for future use)
- 10** SATA Connector 1 - SATA hard disk drive model only
- 11** Lithium battery
- 12** CMOS clear jumper switch
- 13** SAS Connector 2 - SAS hard disk drive model only (not used)
- 14** SAS Connector 1 - SAS hard disk drive model only
- 15** RAID configuration jumper (SAS model only)
- 16** Connectors for external devices
- 17** PCI riser slot (low profile board only)
- 18** PCI riser slot (full height board only)
- 19** DIMM sockets (for the interleave type)
The sockets are called #41, #42, #43; #11, #12, #13, #21, #22, #23, #31, #32, #33 sequentially from top.
- 20** Processor sockets
- 21** Backplane connector


Processor

The system board accommodates one or two 64-bit Intel Xeon processors with 4MB cache.

Memory

The system board contains twelve 184-pin DIMM slots each supporting 72-bit ECC (64-bit main memory plus ECC) registered Fully Buffered DIMMs (DDR2 533 or DDR2 667 compatible). You may install a minimum of 1 GB (512 MB × 2) and as much as 48 GB.

The controller automatically detects, sizes, and initializes the memory array, depending on the type, size, and speed of the installed DIMMs, and reports memory size and allocation to the server via configuration registers.

 *Note: Use DIMMs that have been tested for compatibility with the server board. Contact your sales representative or dealer for a current list of approved memory modules.*

PCI Riser Slots

The mother board has two PCI riser slots:


- One supporting full height PCI cards.
- One supporting low-profile PCI cards.

Video

The mother board uses an embedded graphics accelerator with 2 MB of VRAM.

The mother board 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.

Network Controller

 *Note: To ensure EMC product regulation compliance, the system must be used with a shielded LAN cable.*

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

The network controller supports the following features:

- 64-bit, 100 MHz PCI-X interface
- Integrated IEEE 802.3 10Base-T, 100Base-TX, and 1000Base-T compatible PHY

- IEEE 820.3u auto-negotiation support
- Chained memory structure similar to the 82559, 82558, 82557 and 82596
- Full duplex support at both 10 Mbps, 100 Mbps, and 1000 Mbps operation
- Low power +3.3 V device.

Keyboard and Mouse

The keyboard/mouse controller is PS/2-compatible. A Y-cable can be used if both a PS/2 mouse and keyboard are required at the same time.

ACPI

The mother board supports the Advanced Configuration and Power Interface (ACPI) as defined by the ACPI 2.0 specifications. An ACPI aware operating system can put the system into a state where the hard drives spin down, the system fans stop, and all processing is halted. However, the power supply will still be on and the processors will still be dissipating some power, so the power supply fans will still run.

The system board supports sleep states s0, s1, s4, and s5:

- 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 wakeup event will restore the system state from the disk and resume 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 CSB and the BMC are running in this state. No context is saved by the OS or hardware.

Caution

The system is off only when the AC power cord is disconnected.

Remote Management Card Feature

Server management is concentrated in the Remote Management Card (RMC). The RMC and associated circuitry are powered from a 5V DC standby voltage, which remains active when system power is switched off, but the ac power source is still on and connected.

The RMC supports Dianascope, which allows remote server management through the network. Events monitored by the manager system include over-temperature and over-voltage conditions, fan failure, or chassis intrusion.

Information on Dianascope may be found in the ExpressBuilder CD-ROM.

One major function of the RMC is to autonomously monitor system management events, and log their occurrence in the nonvolatile System Event Log (SEL). The events being monitored include overtemperature and overvoltage conditions, fan failure, or chassis intrusion. To enable accurate monitoring, the RMC maintains the nonvolatile Sensor Data Records (SDRs), from which sensor information can be retrieved. The RMC provides an ISA host interface to SCR sensor information, so that software running on the server can poll and retrieve the server's current status.


The RMC performs the following:

- Monitors server board temperature and voltage*
- Monitors processor presence and controls Fault Resilient Boot (FRB)
- Detects and indicates baseboard fan failure*
- Manages the SEL interface
- Manages the SDR Repository interface
- Monitors the SDR/SEL timestamp clock
- Monitors the system management watchdog timer
- Monitors the periodic SMI timer
- Monitors the event receiver
- Controls secure mode, including video blanking, diskette write-protect monitoring, and front panel lock/unlock initiation
- Controls Wake On LAN via Magic Packet support.

* NEC ESMPRO also supports these features.

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.

 *Note: The degradation feature is only available when at least two DIMMs or processors are installed.*

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

Memory RAS Features

Your server board has memory mirroring and online spare memory features. For more information see ["Using the Memory RAS Features" on page 126.](#)

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, use the BIOS setup utility, "SETUP." (See [“BIOS Setup Utility” on page 67.](#))

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

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

AC-Link Feature

When the power cord of the server is connected to an uninterruptible power supply (UPS) unit, the server supports the power linkage feature that enables control over the power supply from the UPS to the server. The AC-Link feature can be enabled or disabled with the Server menu of the BIOS setup utility, "SETUP." (See [“BIOS Setup Utility” on page 67.](#))

Standard Features

- Intel® Xeon® Processor
- High-speed network interface (1000 Mbps/100 Mbps/10 Mbps supported)
- High-speed disk access (SAS or SATA2)
- High-speed memory access (DDR2-533 od DDR2-667)
- Remote Management Controller
- Memory monitoring feature (error correction/error detection)
- CPU/memory degradation feature (logical isolation of a failed device)
- Memory chip kill
- Memory mirroring/online spare memory feature
- Bus parity error detection
- Temperature detection
- Error notification
- Internal fan monitoring feature
- Internal voltage monitoring feature
- Redundant power supply (hot-swap)
- RoMB (RAID on motherboard)
- Auto-rebuild feature (optional, hot-swappable)
- BIOS password feature
- Mechanical security lock
- Onboard RAID controller
- Redundant fans (optional)
- Redundant power supply (option in 1*)
- Remote Management Card (optional)
- NEC ESMPRO
- NEC DianaScope
- Off-line Maintenance Utility
- Memory dump feature using the DUMP switch
- One PCI EXPRESS (x8) bus
- One PCI-X (64-bit/100MHz bus)
- Large memory of up to 48 GB
- Hot-swap hard disk drive bays:
 - up to 3 SATA 3.5" HDDs
 - up to 3 SAS 3.5" HDDs
- Up to two multi-processors are available for upgrade.
- One optical bay
- USB2.0 interface (A USB support driver is required)
- Graphics accelerator support
- El Torito Bootable CD-ROM (no emulation mode) format support
- POWER switch mask
- Software power-off
- Remote power-on feature
- AC-Link feature
- Consoleless feature


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

- ExpressBuilder
(system setup utility)
- Configuration Parameter Diskette
Creator
- SETUP (BIOS setup utility)
- SoftwareRAID Setup Utility (Onboard RAID configuration utility)

Power Supply

The system contains one auto-sensing 660-watt power supply at an operating frequency of 50/60 Hz.

A second optional power supply may be added in the SAS configuration 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 server.


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

The power subsystem supports implementation of remote management features including remote enable that permits power to be activated from different sources.

Peripheral Bays

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

- A standard optical device drive bay
- Three hot-swap hard disk drive bays used to mount hard disk drives installed in easily removable drive carriers.

 *Note: The hot-swap 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.*

System Cooling

The server includes a fan module with eight fans for cooling the processor(s), hard drives, and PCI cards. It can also include seven optional redundant fans (option).

The fan system is located in the middle of the chassis to pull cooling air through the chassis. The power supply contains two built-in fans for cooling.

Server Security

To help prevent unauthorized entry or use of the server, the server includes a full lockable front bezel and Server Management software that monitors the front bezel intrusion switch.

Security with Mechanical Locks and Monitoring

To unlock the bezel, insert the key in the lock and turn the lock counterclockwise until it stops (about a quarter turn).

The bezel is unlocked and can be opened again.

To lock the bezel, insert the key in the lock. Turn the lock clockwise until it stops (about a quarter turn).

The bezel is locked and cannot be opened.

Software Locks via the BIOS Setup Utility

The BIOS Setup Utility provides security features to prevent unauthorized or accidental access to the system. Once the security measures are enabled, you can access the system only after you enter the correct password(s). For example:

- Mask the power switch function after the power-on.
- Set and enable a supervisor password.
- Set and enable a user password.
- Disable access to the boot sector of the operating system hard disk drive.

You can set either the user password, the supervisor password, or both passwords. If only the user password is set, you:

- Must enter the user password to enter BIOS Setup.
- Must enter the user password to boot the server if Password on Boot is enabled in the BIOS Setup.
- Must enter the user password to exit secure mode.

If only the supervisor password is set, you:

- Must enter the supervisor password to enter BIOS Setup.
- Must enter the supervisor password to boot the server if Password on Boot is enabled in the BIOS Setup.
- Must enter the supervisor password to exit secure mode.

If both passwords are set, you:


- May enter the user password to enter BIOS Setup. However, you will not be able to change many of the options.
- Must enter the supervisor password if you want to enter BIOS Setup and have access to all of the options.
- May enter either password to boot the server if Password on Boot is enabled in either the BIOS Setup.
- May enter either password to exit secure mode.

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 Express5800 System” feature of the Master Control menu (available from the windows-based ExpressBuilder).
- Install utilities, such as management software for Windows (NEC ESMPRO, 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.

Making Connections

Connect your keyboard, monitor, and mouse. Also connect any external peripheral devices 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.
 - A leased line cannot be connected directly to the serial port connectors.
 - Secure the power cord(s) and interface cables with a tie wrap.
 - Form the cables in such a way that they will not come into contact with the door or the guide rails on the sides of the server.
-

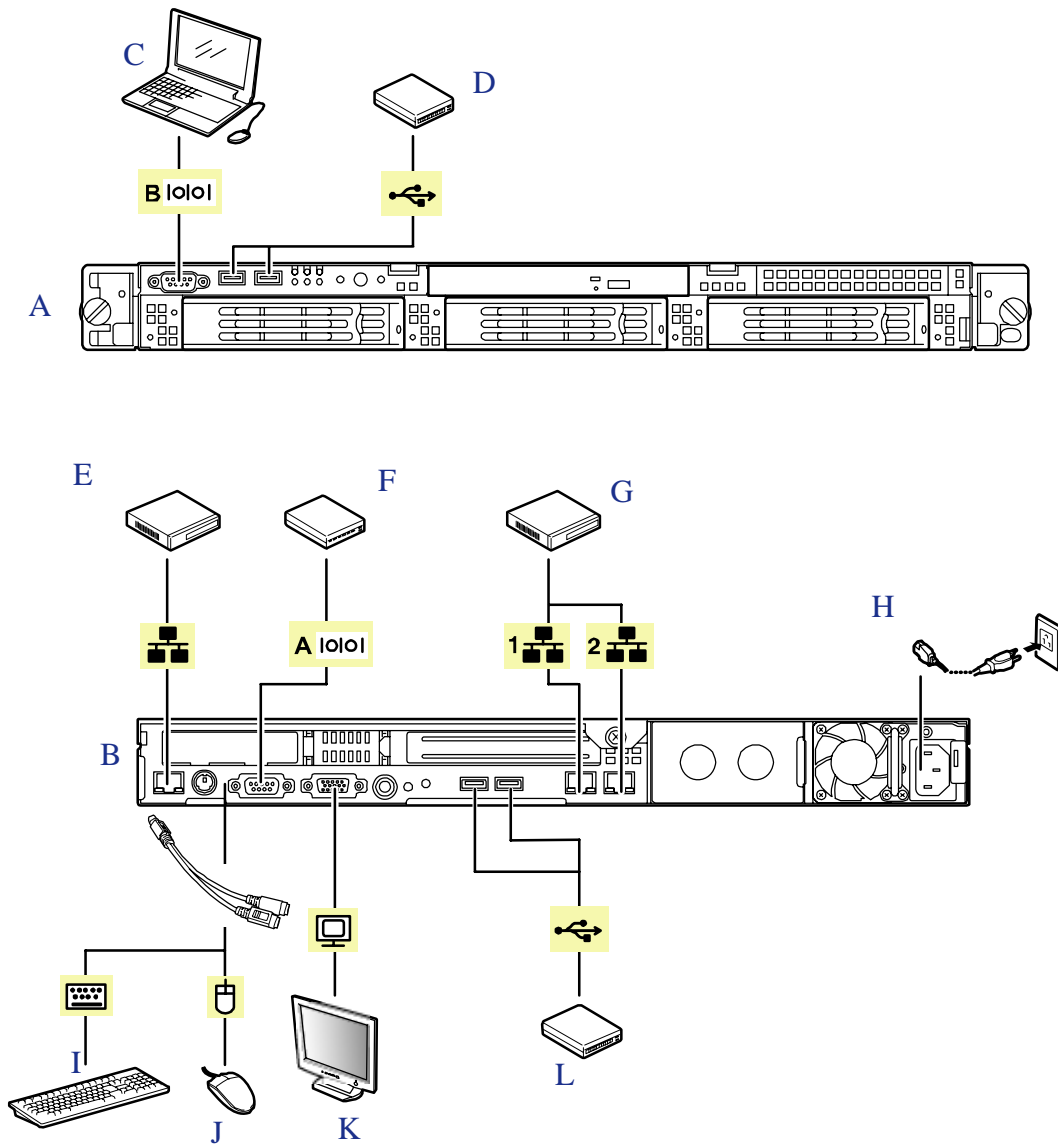


Figure 9: Connecting Peripheral Devices

- A Front
- B Rear
- C Device with the serial interface (e.g., Management PC)
A leased line cannot be connected directly to this connector. The console of a management PC can be connected to only serial port 2. (BIOS setup required.)
- D USB device
- E Hub (multiport repeater)
- F Device with the serial interface
- G Device with the SCSI interface

- H Connect the provided power cord to the receptacle.
Connect the power cord to a circuit breaker of 15 A or less.
If connecting the server to UPS, see the explanation below.
- I Display unit
- J USB device
- K Keyboard
- L Mouse
- 1 100BASE-T/1000BASE-TX/10BASE-T
- 2 100BASE-T/1000BASE-TX/10BASE-T

Connecting the Power Cord

1. Plug the female end of the AC power cord into the input receptacle on the rear of the power supply cage.
2. 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 server 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.

Warning

Your server 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.

Setting Up the Server

Overview

This chapter describes how to:


- select a site,
- unpack the server,
- install the server into a standard EIA 19-inch rack cabinet,
- make cable connections,
- power on/off the server.

Selecting a Site

To use the server, install it on a standard EIA 19-inch rack assembly ([See “Installing the Server into a Rack” on page 45.](#)).

The rack has to be installed in 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 server 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

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 Server

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.

Installing the Server into a Rack

This section provides the instructions to install the server into a standard EIA 19-inch rack cabinet.

Before Installation

Warning

- Do not use any rack which does not conform to the relevant standard.
 - Disconnect the power cord(s) before installing or removing the server.
 - Do not install the server on the rack leaving the cover removed.
 - Do not pinch your finger with mechanical components.
-

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.

Checking Components

Check that you have the components to install the server on the rack (screws, core nuts, sliding rails).

Required Tools

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

Installing the Server

Preparing before Installation

The slide rail is fixed with the screw to prevent its falling off during transportation. Remove the left and right core nuts from the front of the server before you install the server in the rack.

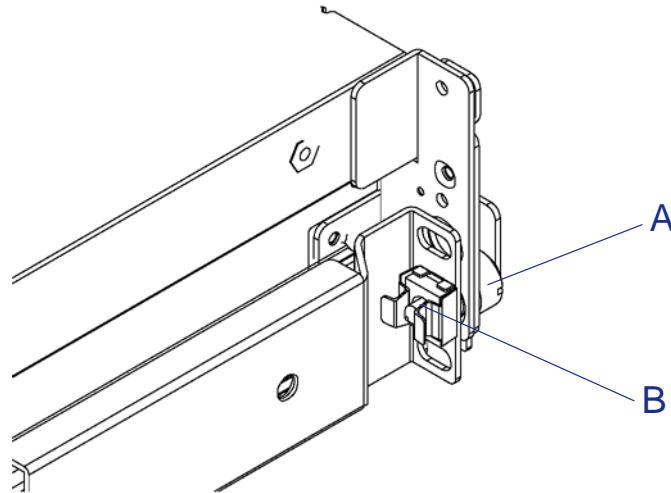


Figure 10: Removing the Core Nut before Installing the Server

- | | |
|----------|------------------|
| A | Set screw |
| B | Core nut |

Hold the core nut, and rotate the set screw to remove the core nut.

Keep the removed core nuts for future use.

Removing the Rail Assemblies

1. Remove the sliding rails from the server.
2. Hold the rails and slowly slides them toward the rear of the server until a 'click' is heard.
The rails are locked.
3. Push the release levers on the right and left sides of the server, and remove the rail assemblies from the server while unlocking.

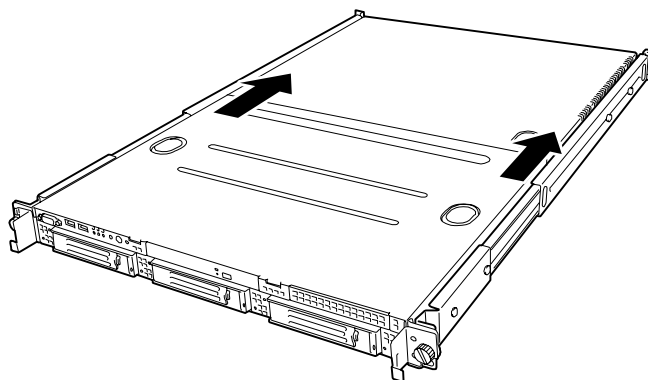
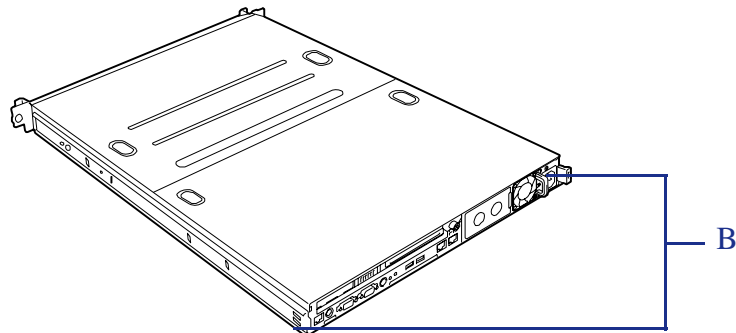


Figure 11: Removing the Rails Assemblies from the Server

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



B - Inner Rails

Figure 12: Inner Rails

Caution

The removed rail assemblies are to be installed on the inner rails later. To install each rail assembly on the correct inner rail, make a mark on the assemblies.

When installing more than one server, distinguish between the pairs of inner rails and rail assemblies of the servers by making marks.

Installing the Core Nuts on the Rack

You have to install:

- three core nuts on the front of the rack for each of the right and left sides,
- two core nuts on the rear of the rack for each of the right and left sides.

Three slots (square holes) are opened per 1U of a rack. For any NEC rack, round marks are put in the unit of 1U.

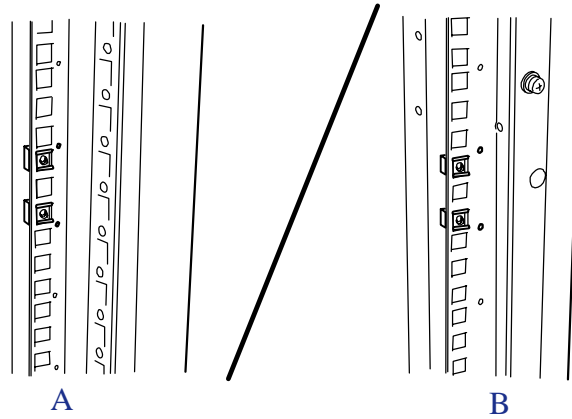
You have to install one core nut in each of the three slots of the 1U (*A in Figure 2-3 below*).

To install one core nut in a slot:

1. Hang a clip of the core nut on a slot on the rack.
2. Insert the other clip into the slot by using a tool such as a flat tip screwdriver.
For one core nut installed on the front of the rack:
 - the lower nut fixes the front of the rail assembly,
 - the upper nut supports the set screw of the server.


Use the previous procedure to install one core nut in the upper slot of the 1U unit and one core nut in the lower slot.

The two core nuts installed on the rear of the rack (B) fix the rear of the rail assemblies.



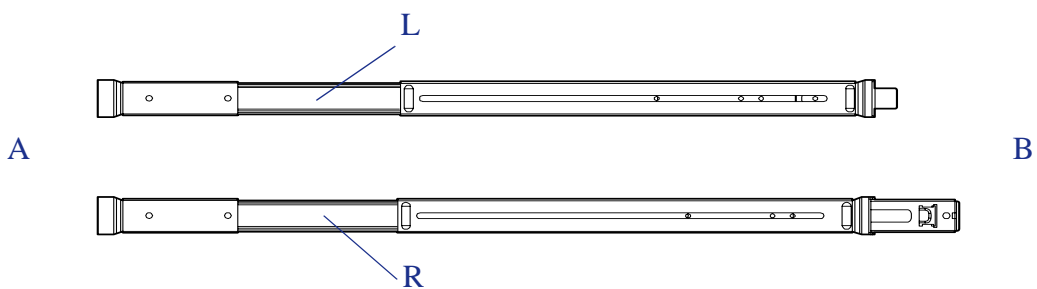
A - Front of the rack B - Rear of the rack

Figure 13: Installing the Core Nuts on the 1U Rack

 **Note:** Check that all the core nuts are installed at the same 1U level.

Installing the Rail Assemblies

Make sure of the right side rail assembly or the left one when installing it.



A - Front
 B - Rear
 L - Left side rail assembly
 R - Right side rail assembly

Figure 14: Left and Right Side Rail Assemblies

1. Remove the screws (*S*) securing the rail assembly.

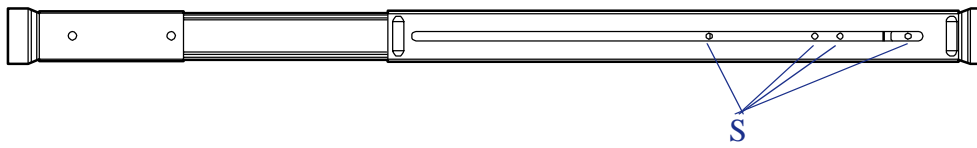

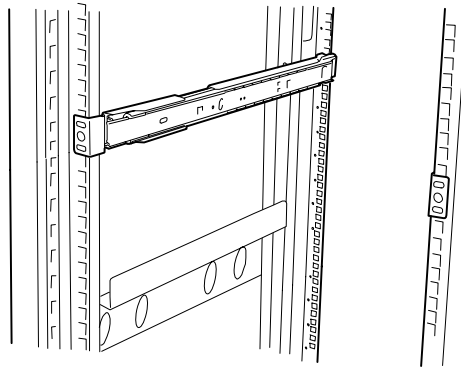


Figure 15: Rail Assembly Screws (S)

2. Align the front and rear frames of rail assembly to the location where the core nuts are installed.
Locate the rail assembly so that the frame of the rack is located between core nuts and frames of rail assembly.

 *Note: Check that the portion of the frame to fix the rail assembly is located in front of the rack frame.*



3. Firmly secure the rail assembly.

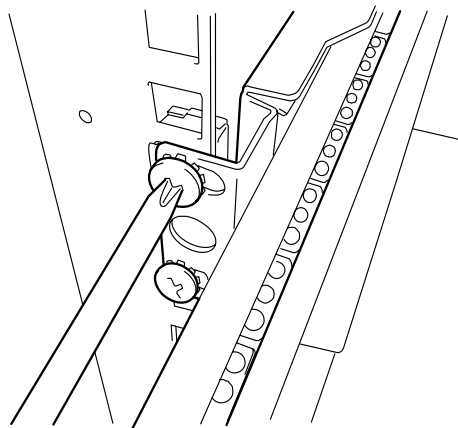


Figure 16: Securing the Rail Assembly

Installing the Server into the Rack

Caution

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See [“General Safety Information” on page 102](#) for details.

- At least two persons are required to install the server.
 - Do not pinch your finger with mechanical components.
-

1. Pull out the sliding rails of the right and left rail assemblies until they are locked.

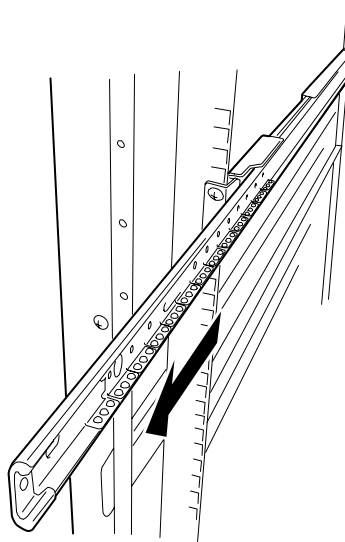


Figure 17: Locking the Sliding Rails

2. Securely hold the server and install it in the rack.
3. Firmly fit the inner rails on the sides of the server into the rail assemblies that are installed on the rack.
4. Slowly push the server into the rack.

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

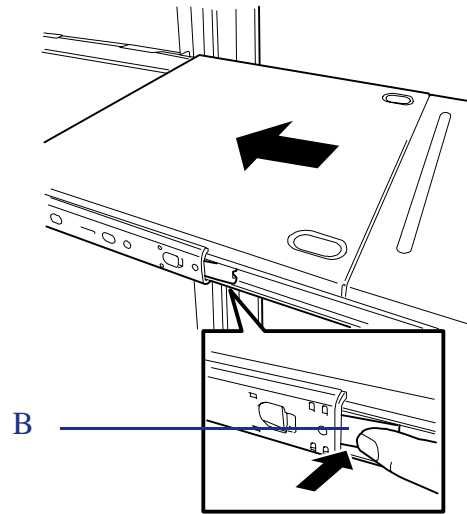



Figure 18: Pushing the Server while Pressing the Release Levers (B)

6. When the server is installed for the first time, the mechanical parts are rather hard to slide. You may feel strong friction when pushing in the server. In this case, strongly push it in.
7. Check that the sliding rails work normally by pulling the server out of the rack and pushing it in several times.

 **Note:** Check that the sliding rails work normally. If the sliding rails are stuck to the rack frame and do not come out, reinstall them.

Securing the Server in the Rack

1. Push the server into the rack as far as it will go.
2. Tighten the right and left captive thumb screws (C) on the server front panel to secure the server to the rack.

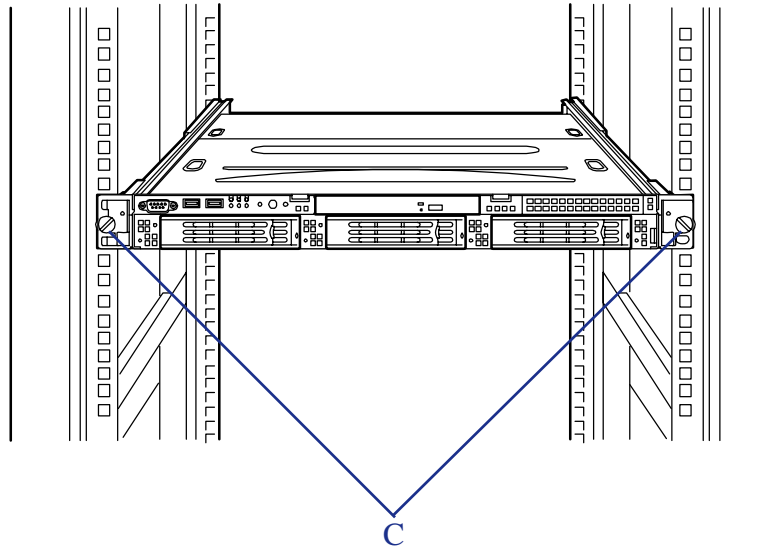


Figure 19: Tightening the Server Captive Thumb Screws (C)

3. Install the front bezel.
4. If you have an optional cable arm, install it by following the procedure ([see “Installing the Optional Cable Arm” on page 53](#)).

Installing the Optional Cable Arm

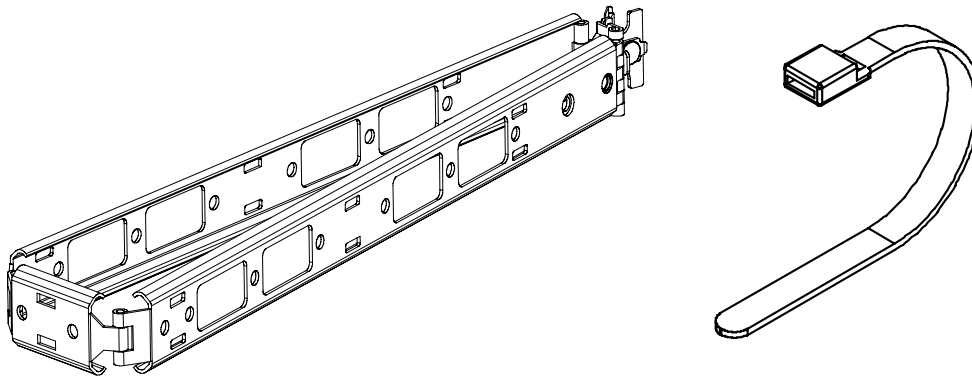
Warning

- Install the cable arm on the basic processing unit carefully, paying attention not to injure people.
 - Do not disassemble, repair, and alter the cable arm. This may cause people to be injured and/or the cable arm and surrounding devices to be damaged.
-

Caution

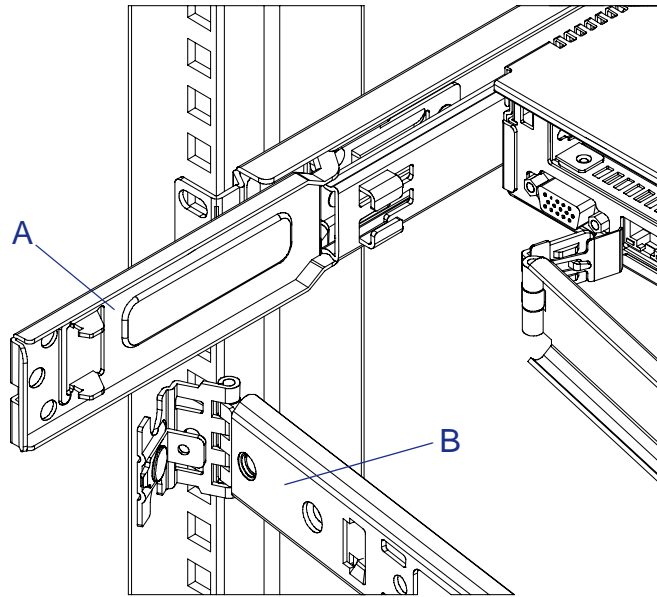
- Do not install the SCSI cable on the cable arm.
 - Always pull out the unit from the rack after removing the cables which are not installed on the cable arm.
-

After unpacking the cable arm, check that the appropriate accessories are contained in the package. The components shown below are required to install the cable arm on the server.



To install the optional cable arm:

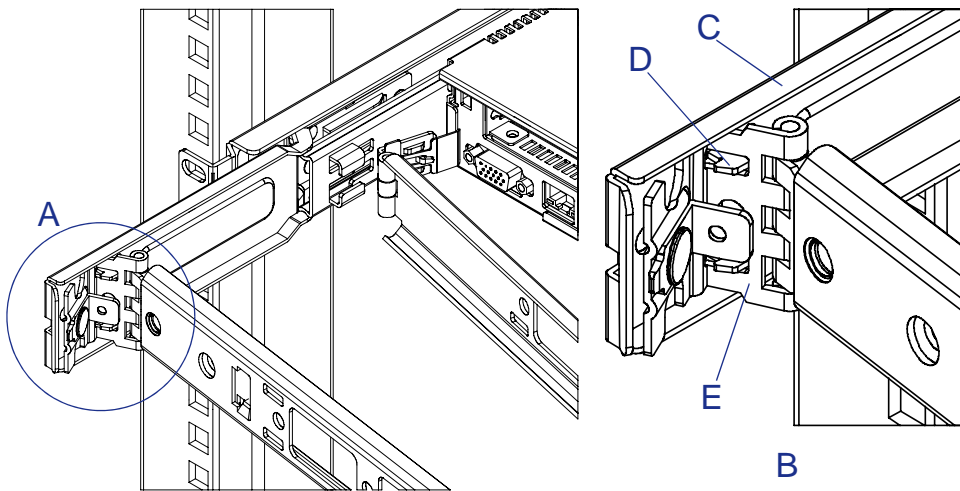
1. Install one end of the cable arm on the rail bracket



- A Rail bracket
- B Cable arm

Figure 20: Installing the Cable Arm on the Rail Bracket

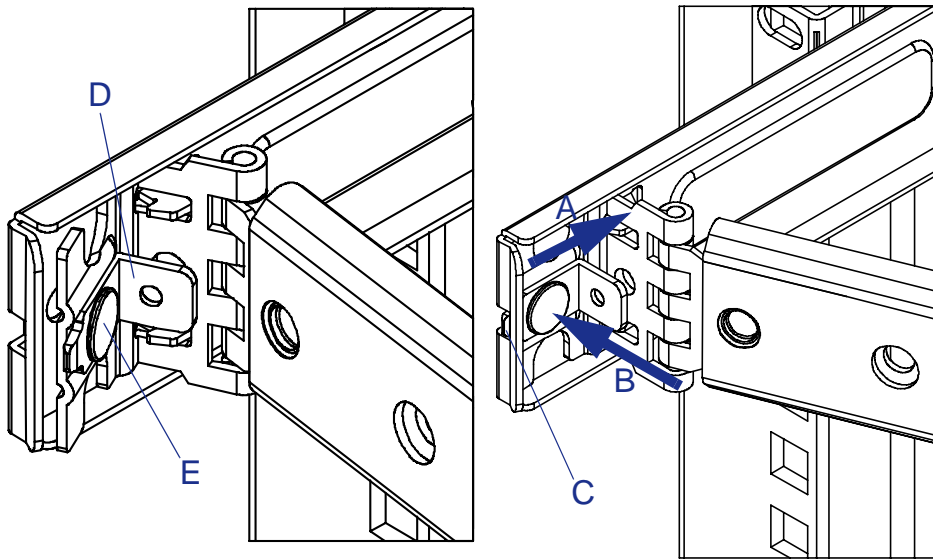
2. Hook the arm stopper A on the nail of slide rail bracket.



- B Detail A
- C Slide rail bracket
- D Nail
- E Arm stopper A

Figure 21: Hooking the Arm Stopper A on the Slide Rail Bracket

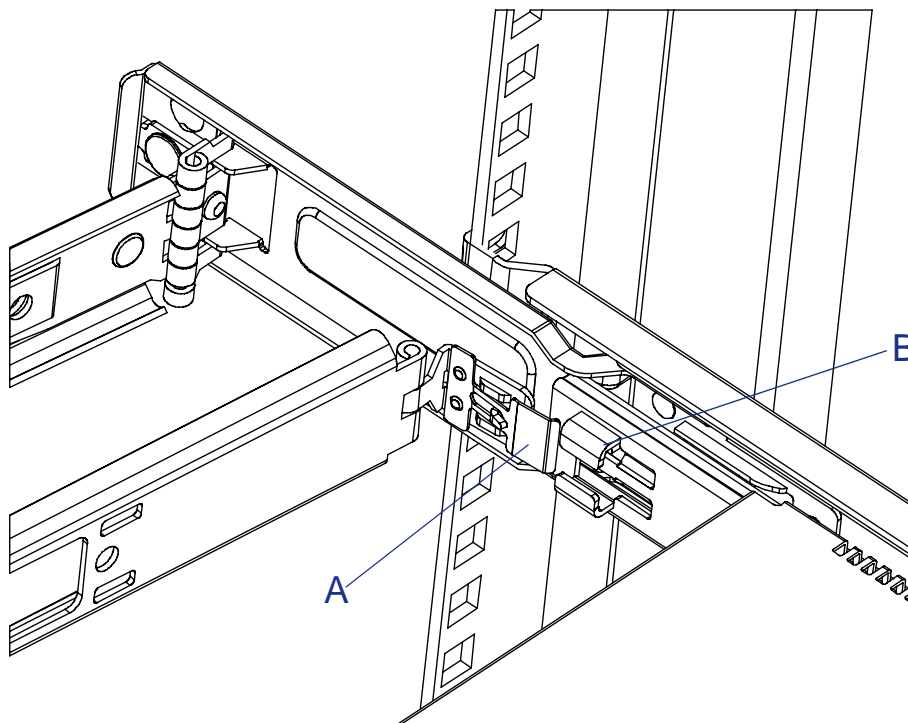
3. Push the Stopper bracket (D) in the direction A and then push the pin (E) in the direction B until stopper bracket locks.



- C Lock
- D Stopper bracket
- E Pin

Figure 22: Locking the Stopper Bracket

4. Install the other end of the cable arm (arm stopper B) into the guide of the inner rail.



- A Arm stopper B
- B Guide of inner rail

Figure 23: Installing Arm Stopper B into Guide of Inner Rail

5. Insert the Arm stopper B into the guide of the inner rail until it locks.

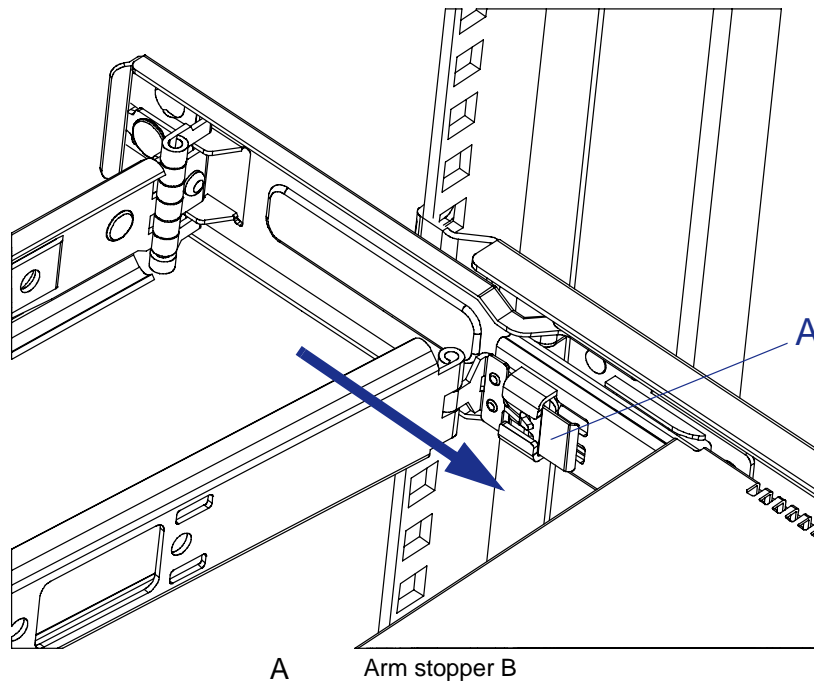


Figure 24: Inserting Arm Stopper B into Guide of Inner Rail

6. Remove and insert the unit for several times to check that:
 - the cable arm is moved smoothly,
 - the unit can be mounted on the rack securely.
7. Temporarily fix the cables to the arm with repeat ties.
8. Fix the cables to the arm securely with the unit pulled out from the rack.

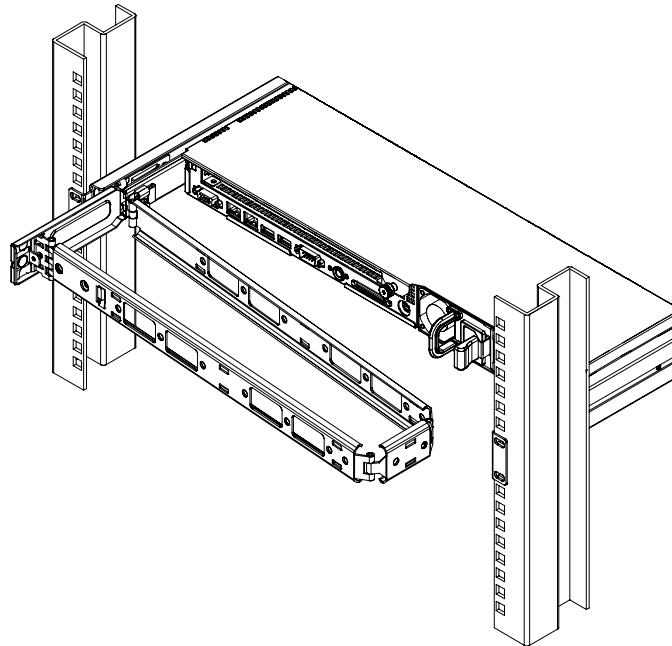


Figure 25: The Optional Cable Arm Installed on

Removing the Server from the Rack Assembly

The server should be removed from the rack by at least two persons.

Warning

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See [“General Safety Information” on page 102](#) for details.

- Do not pinch your finger with mechanical components.
- Note that some components are very hot.
- Do not pull out a device from the rack if the rack is unstable.
- Do not leave more than one device pulled out from the rack at the same time.

1. Release the security lock to remove the front bezel.

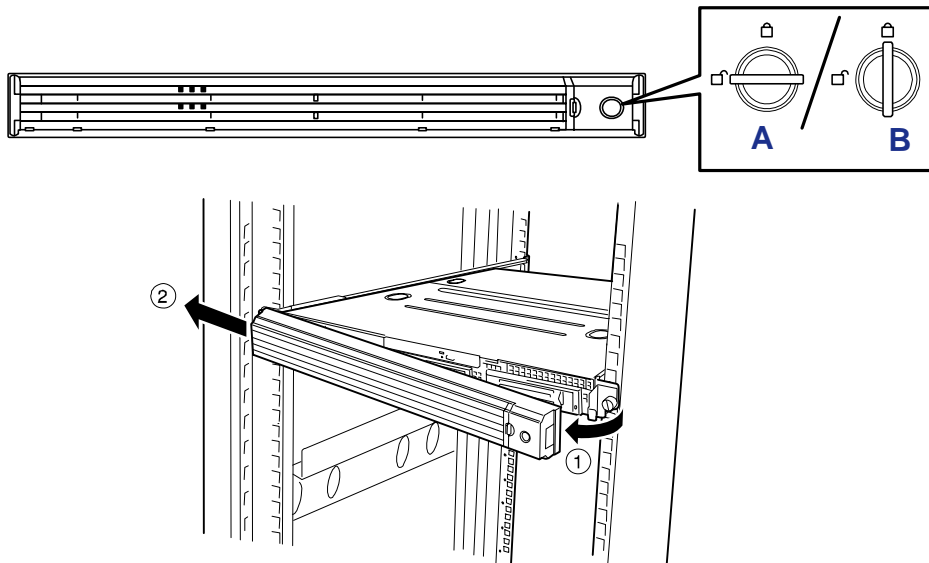



Figure 26: Unlocking and removing the Front Bezel

A - Unlocked B - Locked

2. Power off the server, and disconnect the power cable and all the interface cables connected to the server.

 *Note: To confirm the device you are going to maintain, use the UID switch and the UID LED that goes on when the switch is pressed.*

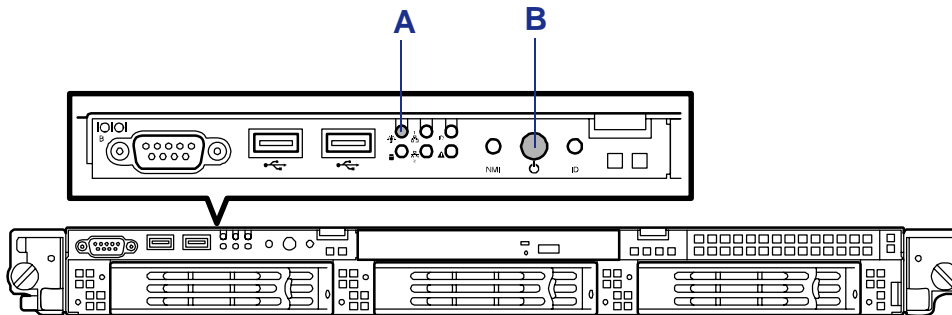


Figure 27: Power LED and Power Switch

A: Power LED
B: Power Switch

3. <This step is required only when the optional cable arm is mounted.>
Remove the two screws securing the cable arm, and dismount the cable arm from the server.
4. Loosen the two captive thumb screws.
5. Hold the handles and pull out the server from the rack slowly and carefully.
Stop pulling when the server locks.

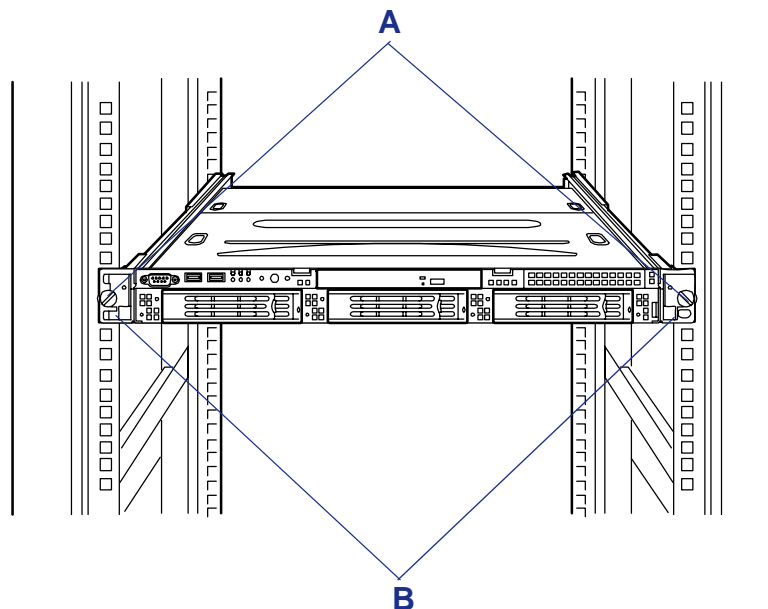


Figure 28: Pulling out the server

A: Thumbscrews
B: Handles

6. Press the right and left release lever to release the latch in order to pull out the server from the rack.

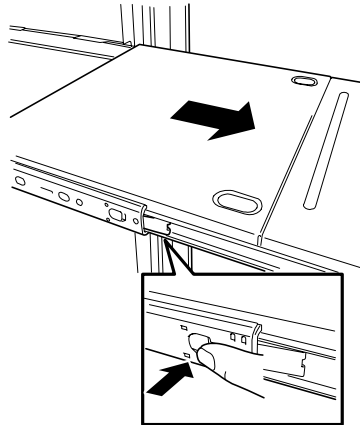


Figure 29: Pressing the release latch

Caution

- Pull out the server slowly holding the bottom of the server by at least two persons.
 - Do not apply any load on the server pulled out from the rack. Doing so may cause personal injury if the server drops.
-

To remove some mechanical parts of the rack, see the installation procedure.

Using the Server

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

When using the server the following precautions should be observed:

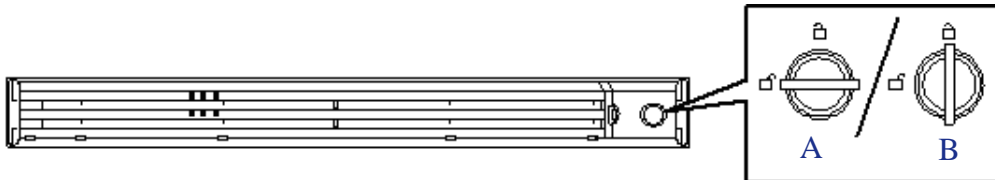
- Make sure you power off the server before connecting or disconnecting cables between the server and peripheral devices. Connecting or disconnecting the cables while the server is powered on may cause malfunction or failures within the server.
- Verify that the access lamp on the diskette drive is unlit 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 30 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 and Installing the Front Bezel

Remove the front bezel to power on/off the server, to access the optical device drive, and to install/remove hard disks to/from the 3.5-inch disk bays.

Removing the Front Bezel

1. Insert the attached security key into the key slot and turn the key to the front bezel side pressing it lightly.
The front bezel is unlocked.



A - Unlocked B - Locked

Figure 30: Unlocking the Front Bezel

2. Hold the right end of the front bezel lightly and pull it toward you ((1) on the figure below).
3. To remove the tab from the frame, slide the front bezel to the left then remove the front bezel from the server (2).

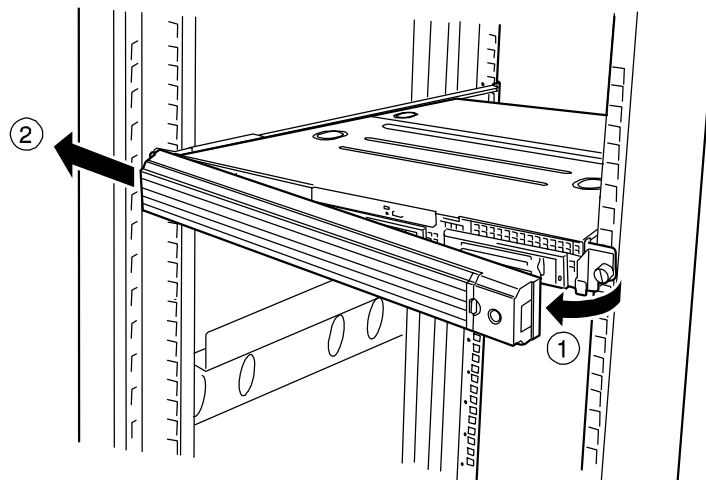


Figure 31: Removing the Front Bezel

Installing the Front Bezel

1. Latch the tab at the left side of the front bezel on the server frame (1) then pull the right end of the front bezel toward the server (2).

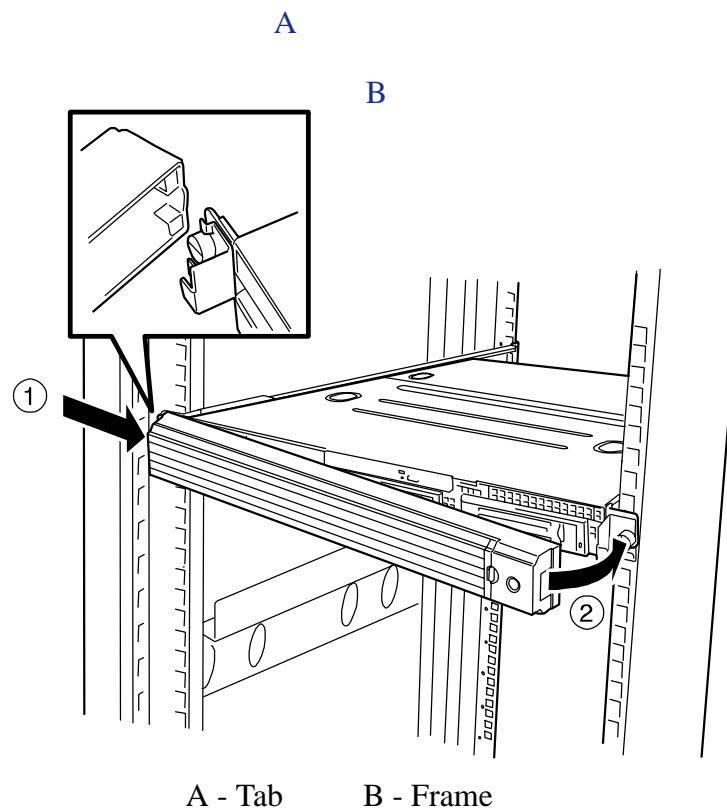


Figure 32: Installing the Front Bezel

2. Lock the front bezel by using the key for security.

Powering On Your Server


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 30 seconds, then press the POWER switch.

To power on your server:

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 device.

 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 device is powered.

3. Remove the front bezel ([See “Removing the Front Bezel” on page 61.](#)).
4. Press the POWER switch on the front of the server chassis. The POWER lamp lights green.

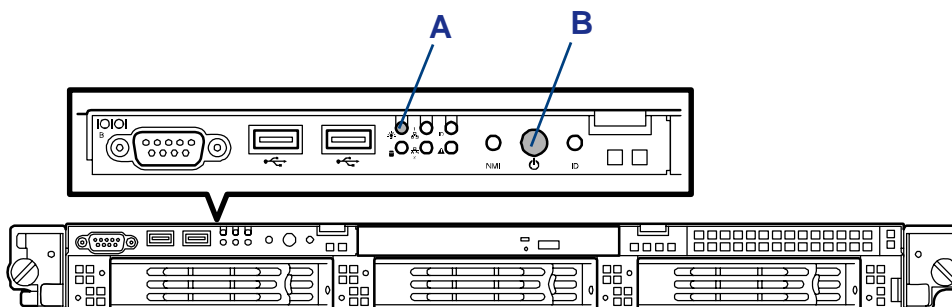


Figure 33: Power lamp and power switch

A: Power lamp

B: power switch


5. If the POWER lamp is not lit, ensure the ac power cord is connected to a functional ac power source.

After a few seconds your server 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 179.*

Caution

- Always allow POST to complete before powering down your server.
 - The server management logic on your system board monitors and logs system voltage changes. When powering down your system you may experience a 1 to 5 seconds delay from the time you press the push-button power on/off switch on the front panel and your system powering down. This is normal system operation and is required by the server management logic.
-

If you have problems powering on your server, [see “Problem Solving” on page 153](#).


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

Powering Off Your Server

When the server power is on, to turn the server off press the power on/off switch on the front panel.

To power off your server:

1. Shutdown the operating system (OS).
2. If necessary, remove the front bezel then press the POWER switch on the front of the server to power off the server.
The POWER lamp lights off.
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 perform a forced 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 30 seconds and then power on again.

Configuring Your Server

Overview

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

The LSI Logic SoftwareRAID Setup Utility configures the disk array and logical drives connected to the onboard RAID controller.

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


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

BIOS Setup Utility

The BIOS Setup Utility is used to change system configuration parameters. The utility is resident in the system FLASH memory and does not require a diskette or an operating system present to run.

Using the BIOS Setup Utility

You can access the BIOS Setup utility when you turn on or reboot your system.

 *Note: The server is factory-configured with the best parameters. Run the Setup utility only when it is required.*

To run the BIOS Setup Utility, perform the following procedure:

1. Power-on or reboot the system. “Press <F2> to enter SETUP” displays.
2. Press **F2**. The BIOS Setup Utility starts and the Main Menu is displayed. The menu bar at the top of the Main Menu lists the following selections:

Table 1: BIOS Setup Menus

Menu	Use
Main Menu	Use this menu for basic system configuration.
Advanced Menu	Use this menu for setting the Advanced Features available on your system.
Security Menu	Use this menu for setting passwords.
Server Menu	Use this menu to configure server specific options, the redirection console and to display server information.
Boot Menu	Use this menu to configure Boot Device priority.
Exit Menu	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 2: BIOS Setup Keys

Key	Function in Setup Menu
F1 or Alt-H	Get Help about an item.
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.

Table 2: BIOS Setup Keys (Continued)

Key	Function in Setup Menu
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 3: 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 to add a delay before the first access of a hard disk drive by the BIOS.	
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) Français Deutsch Español Italiano	Select the display language for the BIOS.	

Primary and Secondary Master & Slave IDE submenus

Table 4: Primary And Secondary Master And Slave IDE Submenus

Feature	Choices or Display Only	Description	Your Setting
Type	Auto None User CD-ROM	Select Auto if a device is attached to the IDE or serial ATA channel. It is strongly recommended to keep the factory setting Auto	
Multi-Sector Transfer	Disabled 2 Sectors 4 Sectors 8 Sectors 16 Sectors	Enables or disables multiple sector transfers support. This field is informational only, for Type Auto.	
LBA Mode Control	Enabled Disabled	LBA stands for "logical block addressing". Instead of referring to locations by passing to the disk a cylinder, head and sector number (CHS addressing), the sectors are serialized so that each just has an integer number; 0, 1, 2, etc. up to the total number of sectors on the disk. Disabled will disable the LBA mode, Auto will enable it if the IDE device supports it. This field is informational only, for Type Auto.	
32-Bit I/O	Disabled Enabled	Enables/disables the 32-Bit IDE data transfer mode.	

Table 4: Primary And Secondary Master And Slave IDE Submenus (Continued)

Feature	Choices or Display Only	Description	Your Setting
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. This field is informational only, for Type Auto. This field is updated to display only the modes supported by the attached device.	
Ultra DMA	Disabled Mode 0 Mode 1 Mode 2 Mode 3 Mode 4 Mode 5	Selects the DMA mode used for moving data to/from the drive. This field is informative only for Type Auto.	

*Processor Settings Submenu***Table 5: 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 the processor on next boot.	
Processor Speed	Display only	Displays the processor speed detected by the BIOS	
Processor 1 CPUID	Display only	Displays the processor CPU ID detected by the BIOS, if present Disabled indicates that the CPU is defective.	
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, if present Disabled indicates that the CPU is defective.	
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.	

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

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 6: Exit Menu

Choices	Description
Exit Saving Changes	Exits after writing all modified Setup item values to NVRAM. F10 key can be used for this operation.
Exit Discarding Changes	Exits 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	Loads default values for all SETUP items. F9 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.

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	Disabled Enabled	Enables or disables the display of the diagnostic screen during boot. If disabled, the Bull logo is displayed.	
Reset Configuration Data	No Yes	Select Yes if you want to clear the Extended System Configuration Data (ESCD) area.	
NumLock	On Off	Selects power on state for NumLock.	
Memory/Processor Error	Boot Halt	If <i>Boot</i> is selected, the system will attempt to boot after a memory or processor error.	

Memory Configuration Submenu

Table 8: Memory Configuration Submenu

Feature	Choices or Display Only	Description	Your Setting
System Memory	Display only	e.g. 640 KB	
Extended Memory	Display only	e.g. 784896 KB	
DIMM Group #1 Status	Display only	Indicates the current memory status. "Normal" indicates the normal status, "Disabled" indicates a memory error, and "Not installed" indicates no DIMM installed (display only). Group #1 indicates DIMMs in DIMM sockets #11 and #21. Group #2 indicates DIMMs in DIMM sockets #31 and #41. Group #3 indicates DIMMs in DIMM sockets #12 and #22. Group #4 indicates DIMMs in DIMM sockets #32 and #42. Group #5 indicates DIMMs in DIMM sockets #13 and #23. Group #6 indicates DIMMs in DIMM sockets #33 and #43. (Memory is interleaved and DIMMs are used per pair.)	
DIMM Group #2 Status	Display only		
DIMM Group #3 Status	Display only		
DIMM Group #4 Status	Display only		
DIMM Group #5 Status	Display only		
DIMM Group #6 Status	Display only		

Table 8: Memory Configuration Submenu (Continued)

Feature	Choices or Display Only	Description	Your Setting
Memory Retest	No Yes	Clears the memory error status	
Extended RAM Step	1MB 1KB Every location Disabled	Test the extended memory once per MB, per KB, every memory location or no test.	
Memory RAS Feature	Interleave Mirror	Disables or enables the memory mirroring feature.	
Sparing	Disabled Enabled	Disables or enables the 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		
Onboard LAN	Select submenu		
PCI Slot 1B Option ROM	Disabled Enabled	Used to enable or disable an option ROM on a PCI board connected to the full-height riser card.	
PCI Slot 1C Option ROM	Disabled Enabled	Used to enable or disable an option ROM on a PCI board connected to the low-profile riser card.	

*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	Allows selecting the onboard VGA controller or optional PCI VGA controller as the display device that will be active when the system boots. The "Force" option is selected to use the onboard VGA controller if the optional PCI VGA controller is installed in the system.	

*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	
LAN1 Option ROM Scan	Disabled Enabled	Initializes device expansion ROM. Only if Onboard LAN Controller is enabled.	
LAN2 Option ROM Scan	Disabled Enabled	Initializes device expansion ROM. Only if Onboard LAN Controller is enabled.	

*Peripheral Configuration Submenu***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.	
Serial ATA	Disabled Enabled	Enables or disables the Serial ATA.	
SATA Controller Mode Option	Compatible Enhanced	Compatible mode: SATA and PATA drives are automatically detected and recognized as legacy mode. Enhanced mode: SATA and PATA drives are automatically detected and recognized as native mode.	

Table 12: Peripheral Configuration Submenu (Continued)

Feature	Choices or Display Only	Description	Your Setting
SATA RAID	Disabled Enabled	Enables or disables the RAID disk drives that use the onboard SATA.	
SATA AHCI	Disabled Enabled	Select Enabled when SATA5 or SATA6 are used (Advanced Host Controller Interface)	
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.	

Security Menu


 *Note: Enabling the Supervisor Password field requires a password for entering Setup. The passwords are not case sensitive.*

Table 13: Security Menu

Feature	Choices or Display Only	Description	Your Setting
Supervisor Password is	Set Clear	Indicates whether the supervisor password is set (display only).	
User Password is	Set Clear	Indicates whether the user password is set (display only).	
Set Supervisor Password	Up to 8 alphanumeric characters	Press Enter to display the supervisor password entry screen. With the supervisor password, all SETUP menus are available for access. This option is available only when you log into the SETUP utility with the supervisor password.	
Set User Password	Up to 8 alphanumeric characters	Press Enter to display the user password entry screen. With a user password, only certain menus are accessible. This option is available only if the Supervisor Password is set.	
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. When set to Enabled, once the operating system has started, you cannot turn off the system using the power switch. Forced shutdown is also unavailable. (See “Forcing a Power Shutdown” on page 65.)	

Server Menu

Table 14: 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 ESMPRO Agent in order to use this function.	

Table 14: 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].

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 15: 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 16: 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 16: Console Redirection Submenu (Continued)

Feature	Choices or Display Only	Description	Your Setting
Console 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 17: 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 18: Boot Menu

Feature	Description
USB CDROM	USB CD-ROM drive
IDE CD	ATAPI CD-ROM (including DVD-ROM drive)
USB FDC	USB floppy disk drive
USB KEY	USB flash memory device
IDE HDD	IDE hard disk drives
PCI SCSI	Internal hard disk drives installed in your system ("Software RAID" is displayed in the RAID configuration.)
PCI DEV	<p>IBA GE Slot xxxx Onboard LAN. LAN1: Slot 0C00, LAN2: Slot 0C01</p> <p>Other indication Optional PCI board connected to the riser module.</p>

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

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

When eight boot devices are registered, no other device can be registered as a boot device, even if you press **X**. To register another device as a boot device, you first need to delete the registration from a device which is not anymore used to boot.

Pressing **Shift + 1** after selecting a device enables/disables the selected device.
- You can change the boot priority (first to eighth) of each device by using the up and down arrow keys, and + and/or -.

To change the priority of a device, move the cursor to the device by using the up and down arrow keys, and press + or -.

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 one 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 Removing a Hard Disk Drive” on page 107.](#)

Caution


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

Enabling the RAID Feature (SATA models)

1. Run the BIOS SETUP utility described earlier in the chapter.
2. Choose the Peripheral Configuration submenu in the Advanced menu.
3. Change the options as follows.
 - SATA Controller Mode Option: Enhanced
 - SATA RAID: Enabled
4. Save and exit the BIOS SETUP utility

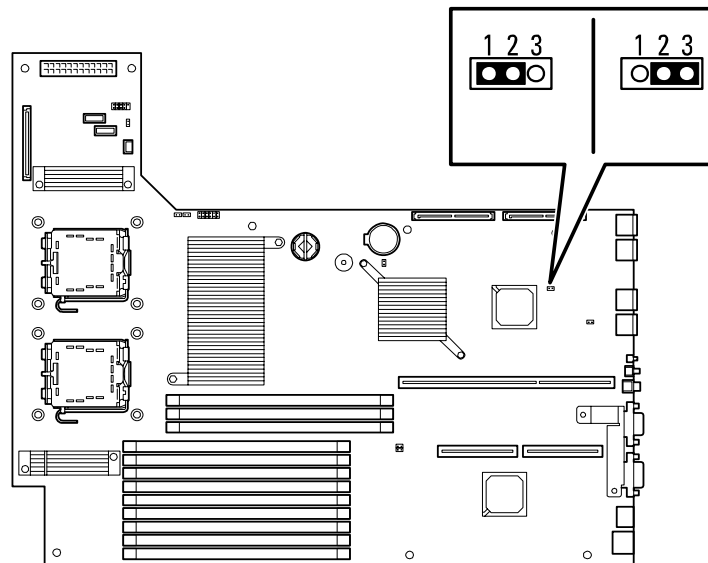
Enabling the RAID Feature (SAS models)

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 Server for Upgrade” on page 105.](#)

2. Remove the logic cover. [See “Removing and Replacing the Top Cover” on page 118.](#)
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 logic 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

 **Note:** Make sure to read the [“Appendix 8: Restrictions” on page 280](#) before configuring RAID.

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.

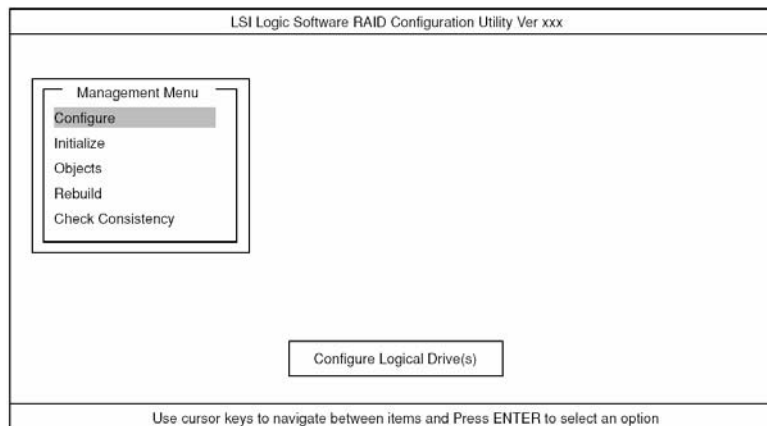


Figure 34: LSI Logic Software RAID Configuration Utility TOP Menu (Management Menu)

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

When a confirmation message appears, select [Yes].



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 19: Menu Tree

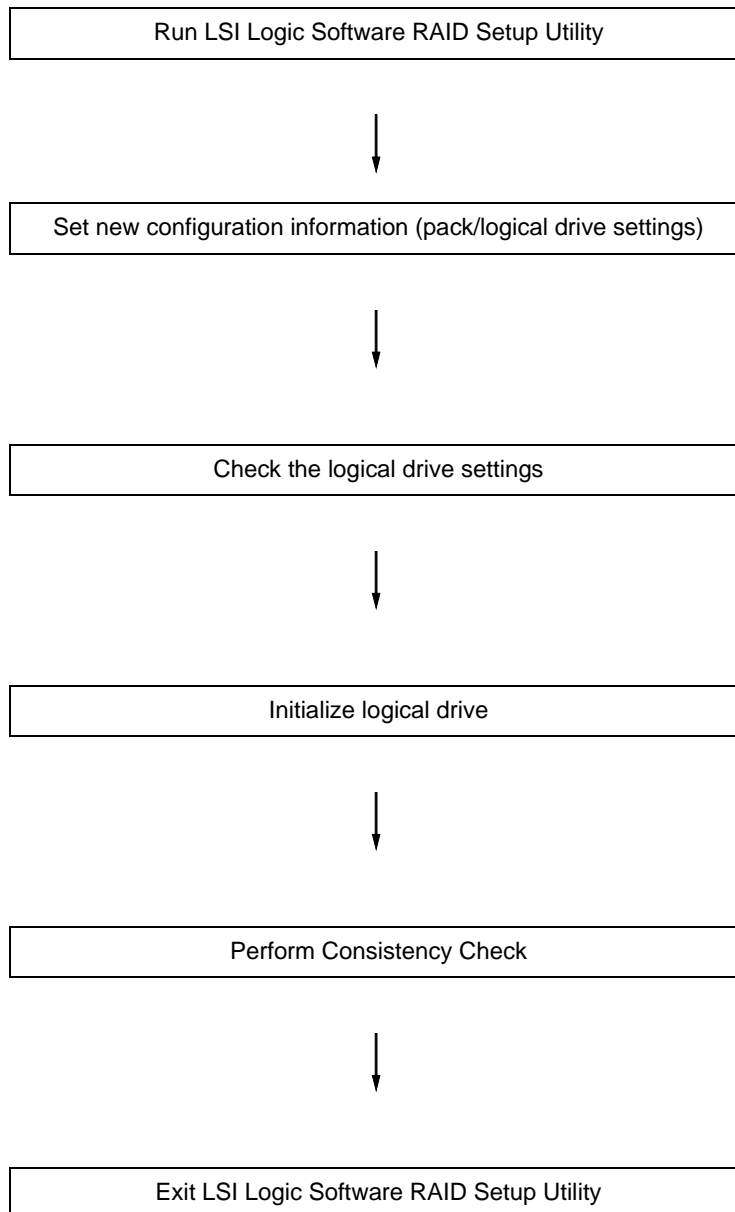
Menu	Description
+Configure	Performs Configuration settings
+Easy Configuration	Set configuration (Using fixed value)
+New Configuration	Set new configuration
+View/Add Configuration	Additional setting / viewing configuration
+Clear Configuration	Clear configuration
+Select Boot Drive	Chose Bootable 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

Table 19: Menu Tree

Menu		Description
	←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
	+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



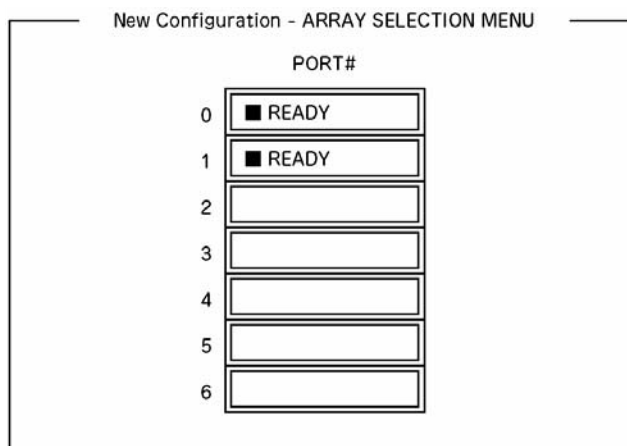
1. Run the LSI Logic Software RAID Setup Utility.
Select "Configure" → "New Configuration" from the TOP menu (Management Menu).
Select "View/add Configuration" to add a configuration.

⚠ 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.
-

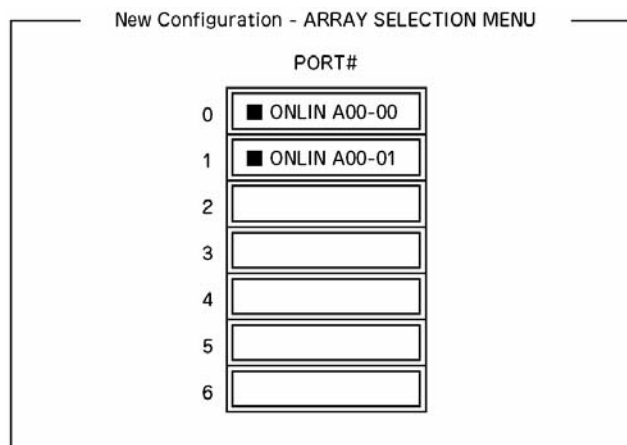
2. When a confirmation message (Proceed?) is displayed, select "Yes."

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.

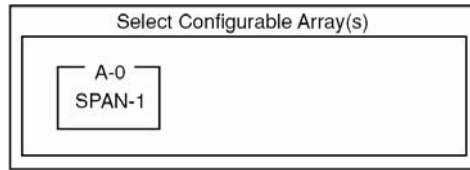


3. Move the cursor onto the hard disk drive to be packed by using the cursor key and then press **Space** to select the hard disk drive.

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

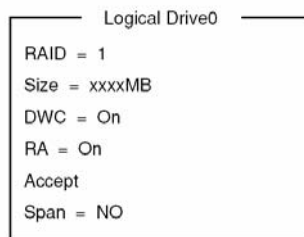


4. Press **F10** to set "Select Configurable Array(s)".
5. Press **Space**.
SPAN-1 is set.



6. 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	Status
0	1	xxxMB	2	64KB	ONLINE



7. Select "RAID," "Size", "DWC", "RA", or "Span" by using cursor keys. Then press **Enter** to fix the selection and set each value.
 - (1) "RAID": Sets 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) "DWC": Sets the parameter for the Disk Write Cache.

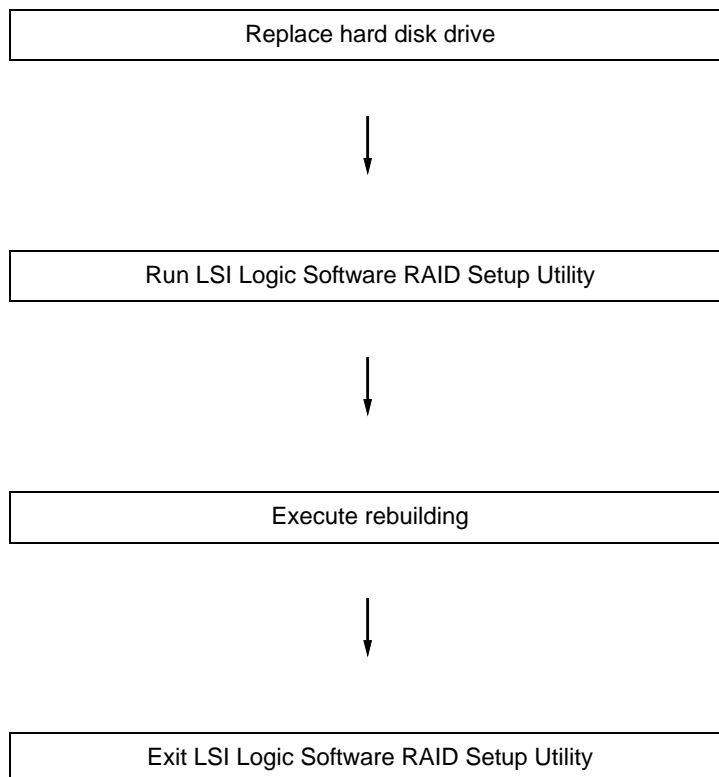
Parameter	Remarks
Off	Write through
On	Write back

16. 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".
-

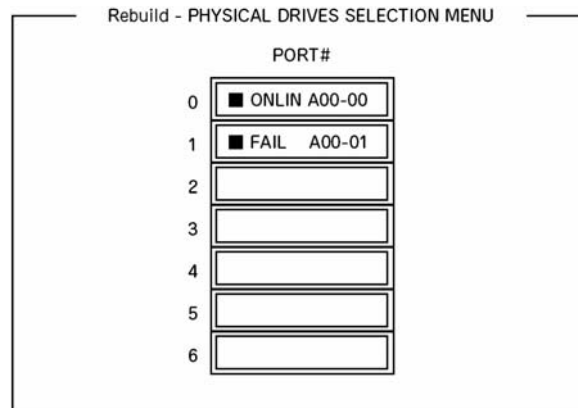
Manual Rebuild



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.



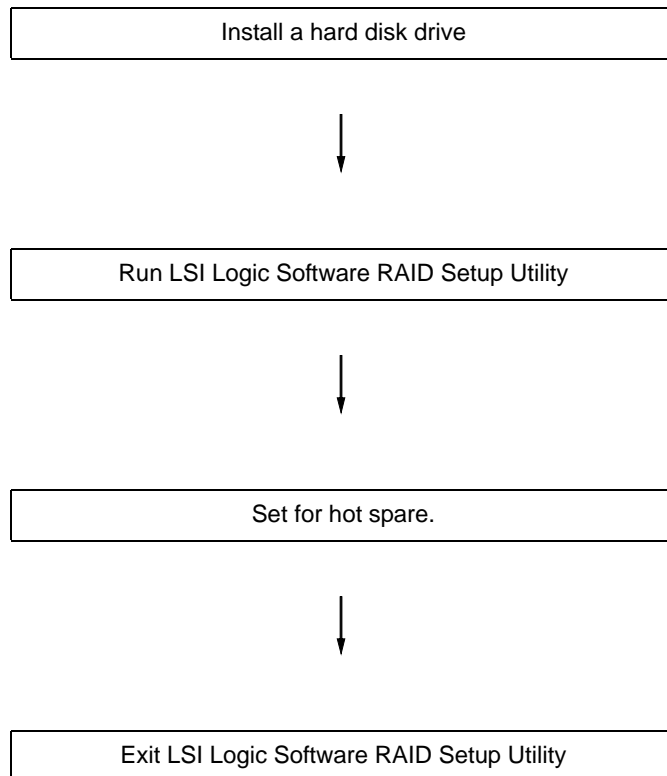
4. Move the cursor onto the hard disk drive displaying "FAIL" and then press **Space** to select it.
Multiple hard disk drives can be selected (simultaneous rebuilding.)
5. The "FAIL" indication for the hard disk drive selected starts blinking.
6. When the hard disk drive has been selected, press **F10**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

The rebuild process starts.

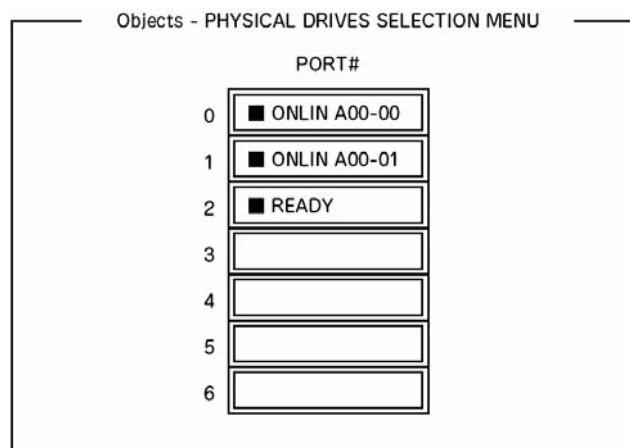
When the progress bar in the "Rebuild Physical Drives in Progress" screen indicates 100%, the rebuilding is completed.

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

Setting Hot Spare

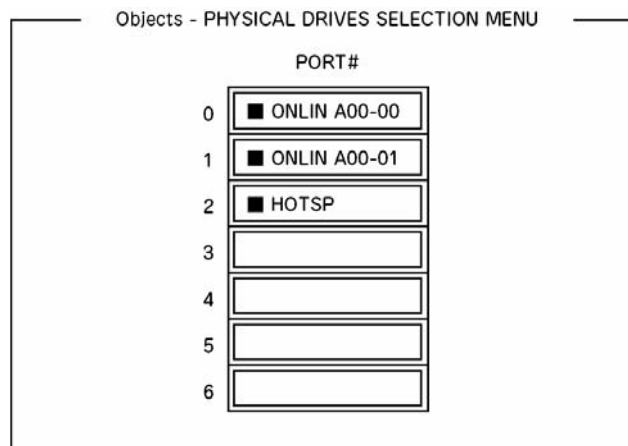


- Install a hard disk drive to be used as hot spare, and then turn on the server.
- Run the LSI Logic Software RAID Setup Utility.
- Select "Objects" → "Physical Drive" from the TOP menu.
The "Objects - PHYSICAL DRIVE SELECTION MENU" screen appears.



- 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."

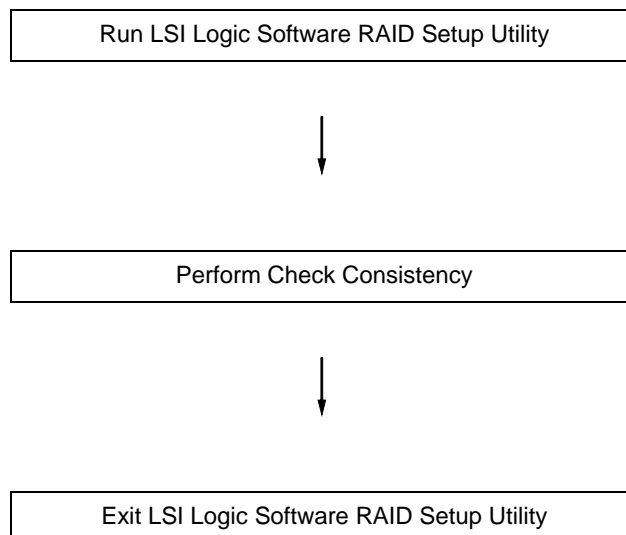
- Press **Esc** to return to the TOP menu and exit the LSI Logic Software RAID Setup Utility.



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.

Configuring Motherboard Jumpers

With the pre-installed SETUP utility, you can set passwords to protect the data stored in the server against access from unauthorized users.

If you forget the passwords, your only option is to 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.

Caution

- 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 motherboard:
 - 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
 - Refer to [“RAID Configuration” on page 83](#) for the RAID Configuration jumper settings.
 - Do not change any other switch settings. Any change may cause the server to fail or malfunction.
 - <For SATA Hard Disk Drive Model Only>
Clearing CMOS sets the SATA RAID Enabled option in the Peripheral Configuration submenu of the Advanced menu to [Disabled]. If the onboard SATA RAID feature is used, change the parameter of this option from [Disabled] to [Enabled] before exiting the BIOS SETUP utility. Leaving this parameter as the factory-set value (Disabled) may destroy the data in the hard disk drive.
-

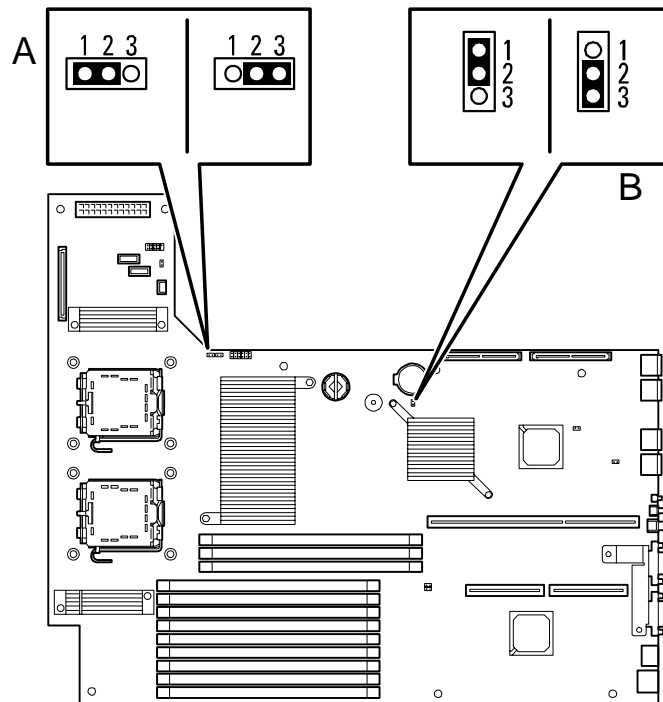


Figure 36: Clear CMOS & Clear Password Jumpers

- | | |
|---|---|
| <p>A Clear password jumper
 (1) Normal
 (2) Clear password</p> | <p>B Clear CMOS jumper
 1-2 = Normal
 2-3 = Clear CMOS</p> |
|---|---|

The following describes the clearing procedure.

Warning

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See [“General Safety Information” on page 102](#) for details.

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

Caution

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See [“General Safety Information” on page 102](#) for details.

- Never attempt to lift the server only by yourself.

- Make sure to complete board installation.
 - Do not install the server on a rack with leaving covers removed.
 - Do not pinch your finger with mechanical components.
 - Note high temperature.
 - Do not pull out a device from the rack if the rack is unstable.
 - Do not leave more than one device being pulled out from the rack.
-

Clearing CMOS or Password

To clear the CMOS or the password, do as follows:

1. Power off the server and disconnect the power cord and all the cables connected on the rear of the server.
2. Remove the logic cover.
3. Locate the position of the jumpers on the motherboard (see [Figure 36: on page 99](#)).
4. For clearing the BIOS password, remove the jumper strap on the BIOS password clear jumper. For Clearing the CMOS, move the jumper strap to the CMOS clear position (2-3).
5. Connect the power cord and power on the server.
6. Wait until the “Password cleared” or “CMOS cleared” message is displayed (about 5 seconds).
7. Power off the server and disconnect the power cord.
8. Re-install the jumper block to the default position.
9. Reinstall the cover removed in Step 2.
10. Plug the power cord and all the cables to the server and turn on the server.
11. Press **F2** when prompted to run the BIOS Setup utility, and select "Load Setup Defaults" at the Exit menu.

Caution

- 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 motherboard.
 - 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
-

Upgrading Your System Information

General Safety Information

Warning

The DC push-button on/off switch on the front panel does not turn off completely the server AC power. Also, +5vdc is present on the system board whenever the AC power cord is connected between the server 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 server can result in personal injury and equipment damage.

Caution

Operating your system with the upper access panel removed can damage your server components.

For proper cooling and airflow, always replace the upper access panel before powering on your server.

Warning

Avoid burns: If the server has been running, any installed processor and heat sink on the processor board(s) will be hot.

To avoid 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 server.

Equipment Log

Use the equipment log form (product configuration record table) located at the end of this manual to record the model and serial number of your server, installed options, and any other pertinent information specific to your server. You will need this information when configuring your server.

[See “Appendix 9: Equipment Log” on page 283.](#)

Tools Recommended for Upgrading Your Server

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 Server for Upgrade

To prepare your server for installation or removal of server components:

1. Observe the safety and static precautions listed under “General Information” and “Static Precautions” at the beginning of this chapter.
2. Shutdown the operating system (OS).
3. Unlock and remove the front bezel. ([See “Removing the Front Bezel” on page 61.](#))

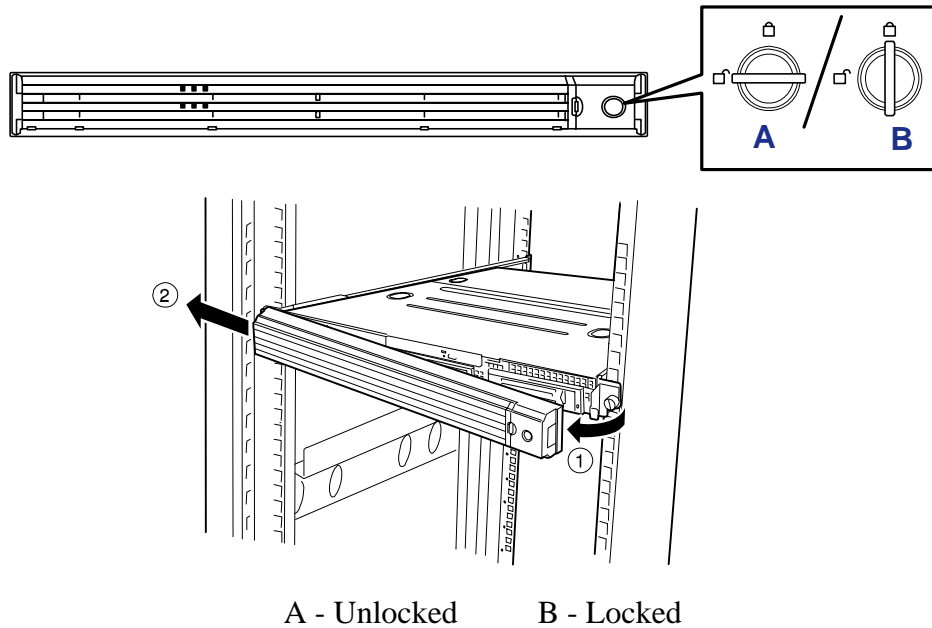



Figure 37: Unlocking and removing the Front Bezel

4. Power off the server then press the POWER switch on the front panel of the server.
The POWER lamp goes out.

 **Note:** To confirm the device you are going to maintain, use the UID switch and the UID LED that goes on when the switch is pressed.

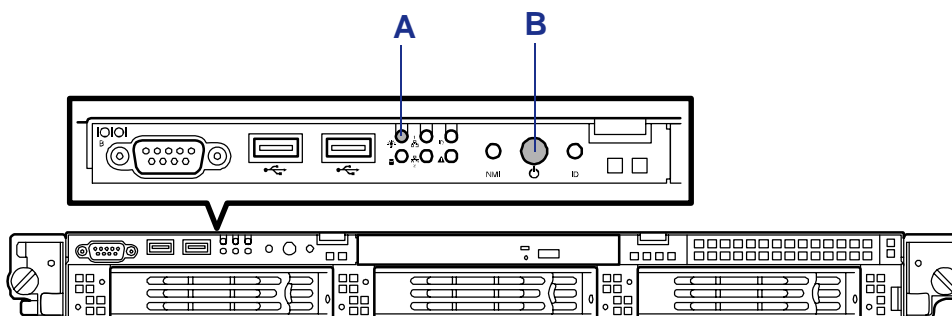



Figure 38: Power LED and Power Switch

A: Power LED
B: Power Switch

5. Power off the peripheral devices.
6. Unplug the server power cord(s) from the AC wall outlet(s).

 *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.*

7. Unplug the I/O cables connected to the rear panel of your server.

Installing and Removing a Hard Disk Drive

The server has three device bay slots to install hard disks in the disk bay of the front of the server.

Caution

- Do not use any hard disks that are not approved by your sales representative. Installing a third-party hard disk may cause a failure of the server as well as the hard disk. Purchase hard disks of the following models:

SAS hard disk drives:

- 36.3 GB, 15,000 rpm, Ultra 320
- 73.2 GB, 15,000 rpm, Ultra 320
- 146.5 GB, 15,000 rpm, Ultra 320
- 300 GB, 15,000 rpm, Ultra 320

SATA hard disk drives:

- 80 GB, 7,200 rpm, serial ATA2
- 160 GB, 7,200 rpm, serial ATA2
- 250 GB, 7,200 rpm, serial ATA2

- To make an array configuration, specify RAID0, RAID1 or RAID5 as the RAID level.
-

All drive slots may contain a hard disk approximately 25.4 mm (1 inch) high. The drive numbers are assigned to the hard disks as shown below.

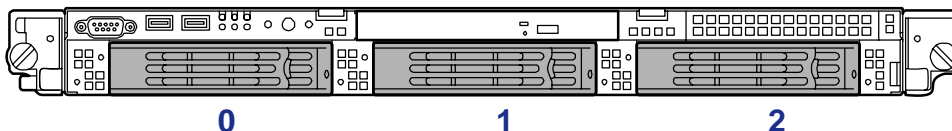



Figure 39: Hard Disk Drives numbers


 *Note: The disk identification numbers, allocated to the hard disk drives by the RAID configuration software, vary between card manufacturers. If you have any doubts, please use the disk management software or the RAID controller BIOS to identify a specific drive.*

The hard disk drive bays are connected to the connector on the motherboard via a backplane in the chassis. To use these drives in a disk array configuration, you can either:

- Use the onboard RAID controller.

- Use an optional RAID controller.

Installing a Hard Disk Drive

 *Note: Hard disks can be installed or removed in or from the server only by opening the front bezel.*

Caution

- In a disk array configuration, only use hard disk having the same specifications, including capacity.
 - Do not press the Power switch during the installation or removal of the hard disk drive if your server is running.
-

1. Read section [“Preparing Your Server for Upgrade” on page 105](#).
2. Unlock of the front bezel with the security key and remove the front bezel.
3. Locate the slot in which you are going to install the hard disk drive. Start with the left-most first vacant slot.
4. Remove the drive carrier.
 - Unlock the hard disk drive handle.

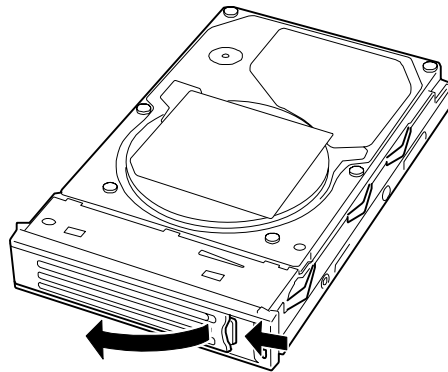


Figure 40: Unlocking the hard disk drive handle

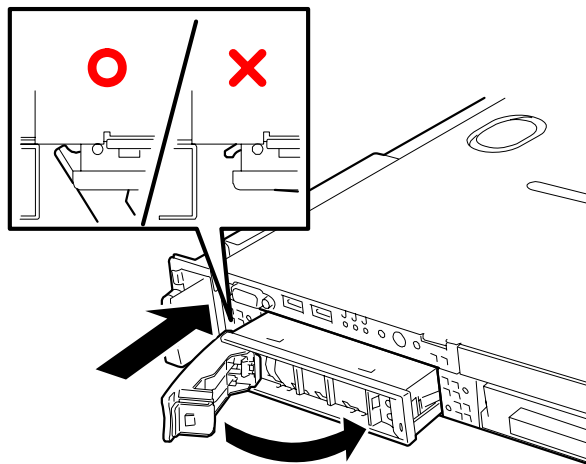
- Pull out the drive carrier from the chassis.

5. Secure a hard disk drive into the carrier with four screws (one at the front and one at the back on both sides).
6. With the handle fully open, hold the drive carrier and handle, and insert it into the chassis.

Caution

- Do not push on the handle until the handle begins to close by itself.
 - Carefully hold the hard disk drive with both hands.
 - Do not press the POWER switch during the installation or removal of the hard disk drive if your server is running.
-

Note: Confirm that the handle is hooked to the frame when having inserted the hard disk drive.



7. When the handle begins to close by itself, slowly close the handle. The drive carrier clicks into place when it is securely locked.


Caution

- Be careful not to get your finger caught between the handle and tray.
 - Push the drive further to check if it is firmly secured.
-

8. Replace the front bezel you removed in step 2.

There are tabs on the left side of the front bezel. Engage the tabs with the server frame, install the front bezel, and lock it with the security key.

Removing a Hard Disk Drive

 **Note:** If removing a failing hard disk drive, confirm the slot in which the DISK lamp of the hard disk drive is amber before starting the removal.

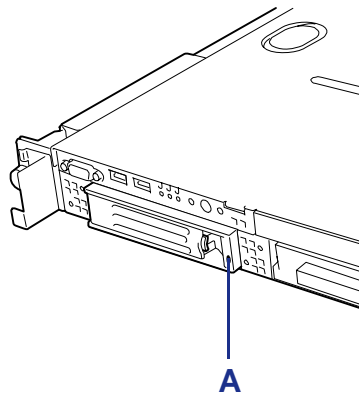


Figure 41: Hard Disk Drive DISK lamp

A - DISK Lamp

1. Read section [“Preparing Your Server for Upgrade” on page 105](#).
2. Unlock the front bezel with the security key and remove the front bezel.
3. Push the lever to unlock and open the handle.

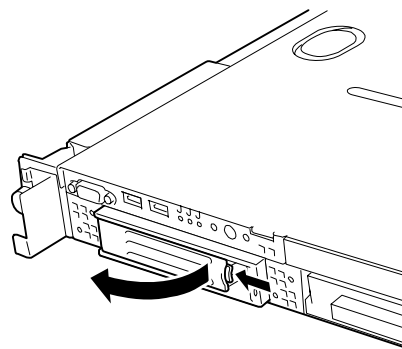
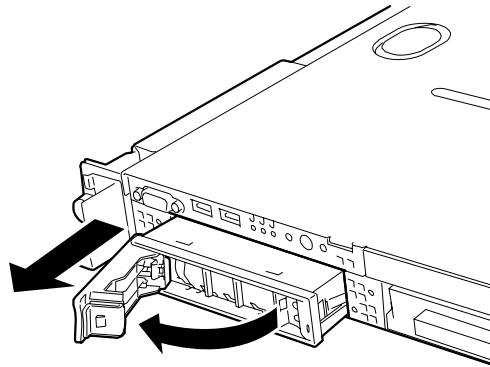


Figure 42: Unlocking the Hard Disk Drive

⚠ Caution

Do not press the POWER switch during the installation or removal of the hard disk drive if your server is running.

4. Firmly hold the handle and hard disk drive and pull out the hard disk drive.



5. When using the server without replacing the hard disk drive, remove the hard disk drive from the disk tray (remove the four screws) and replace the empty tray into the slot.
6. Replace the front bezel.

Notes on replacing Hard Disk Drives in a RAID Configuration

When the hard disks are in the disk array configuration, you can restore the state before an error using the auto-rebuild feature that stores the data in the old hard disk into a new one.


The auto-rebuild feature is available for the RAID1, RAID5, or RAID10 disk array configuration.

Auto-rebuild is carried out when you hot-swap a failed hard disk with a new one (replace the disk while the server is powered). While auto-rebuild is in progress, the DISK lamp flashes green and amber alternatively to indicate it.

Caution

- When auto-rebuild fails, the DISK lamp lights in amber. Remove and install the hard disk again to restart auto-rebuild.
 - If the disk array monitoring utility is installed, it may display or act as follows:
 - Displays "Rebuild was cancelled" on the screen while auto-rebuild is in progress.
 - Appears to stop and restart auto-rebuild.
 - If the DISK lamp does not light in amber after auto-rebuild, however, auto-rebuild has completed successfully.
-

Installing and Replacing a Power Supply Unit (Servers with SAS HDDs only)

 Note: The following procedures apply to the SAS hot-swap HDD configuration.

Your SAS hot-swap HDD configuration contains one or two power supplies.

The second power supply is optional and provides a redundant configuration that ensures continuous operation of the system in the unlikely event one of the power supplies fails

Installing a Power Supply Unit

1. Read section [“Preparing Your Server for Upgrade” on page 105](#).

Caution

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

2. Pull the cable arm toward the rear of the server and confirm the slot for installing an optional power supply unit.
3. Hold and pull the lever of the blank cover and remove the blank cover.

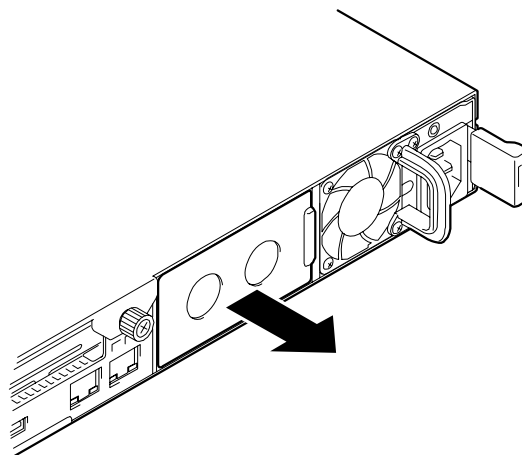


Figure 43: Removing the Blank Cover

4. Keep the removed blank cover for future use.
5. Insert the power supply unit in the server.

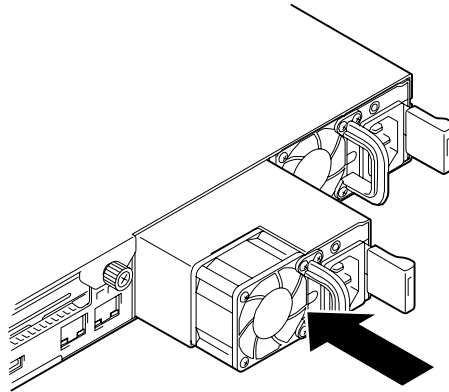
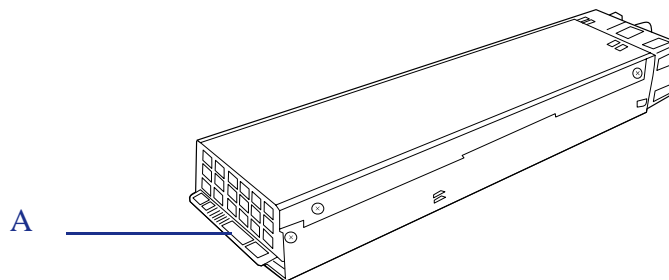


Figure 44: Inserting the Power Unit in the Server

⚠ Caution

Do not touch the terminals A of the power supply unit.



A - Contact terminals

-
6. Grasp the handle and firmly push the power supply until you hear a “click”. The power supply unit is locked.

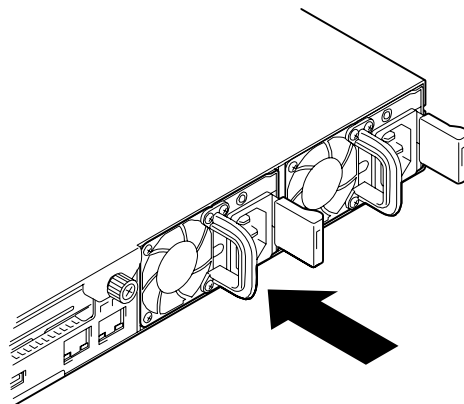


Figure 45: Locking the Power Unit Supply

7. Connect two power cords. Use the power cord provided with the standard power supply unit and the one provided with the server.
The AC POWER lamps flash when the power cords are connected.

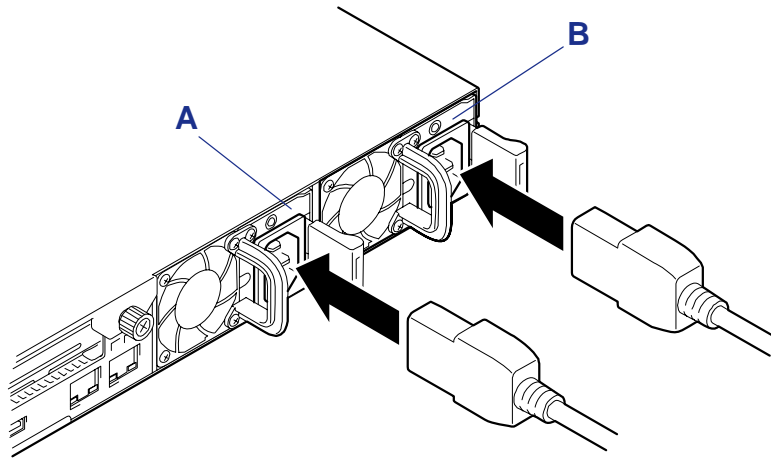


Figure 46: Connecting the Power Cords

A - Power supply unit 1 (Option)
B - Power supply unit 2 (Standard)

8. Power on the server.
The AC POWER lamps go on.

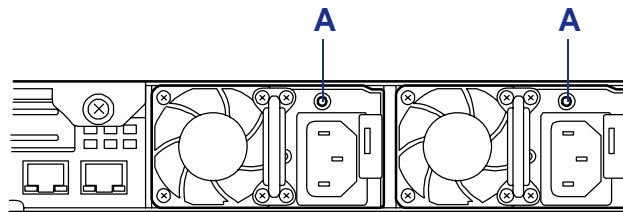


Figure 47: AC Power lamps

A: AC Power LED


9. Confirm, by the STATUS lamp or on the POST screen, that there are no errors related to the power supply units.
10. If the AC POWER lamps are off, reinstall the power supply units. If the same error message still appears, contact your sales representative.

Replacing a Failing Power Supply Unit

Replace only a failing power supply unit.

Caution

Do not remove a power supply unit operating normally.

 *Note: If one power supply unit fails while the server contains two power supply units in a redundant configuration, the failing power supply unit can be replaced with the system operating (power-on state).*

1. Locate the failing power supply unit by the AC POWER lamp on the rear of each power supply unit. (The lamp of the failing power supply unit is amber.)
2. Shutdown the server.
3. To turn off the power, press the POWER switch.
4. Disconnect the power cord from the failing power supply unit.
5. Hold the handle of the failing power supply unit.
6. While pressing the lever (1), pull the power supply unit (2) to remove it from the chassis.

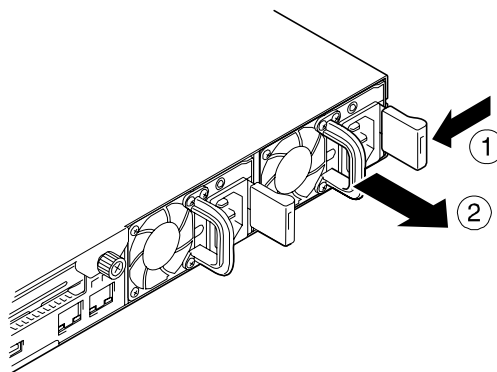



Figure 48: Removing the Power Supply from the Chassis

7. If operating the server with a single power supply unit without installing a new one, install the blank cover you removed in [“Hold and pull the lever of the blank cover and remove the blank cover.”](#) on page 113 of power supply unit installation procedure.

 **Caution**

To maintain the cooling effect in the server, install the blank cover in the vacant slot.

8. Install the new power supply unit. [*See “Installing a Power Supply Unit” on page 113.*](#)
9. Check that the power supply unit is installed correctly.

 *Note: If one of the two power supply units of the server is replaced while the power is on, the POWER lamp of the new power supply unit goes on.
(If it is replaced while the power is off, the lamp flashes. The lamp goes on when you power on the server.)*

Removing and Replacing the Top Cover

The top cover is made of two separate parts:

- the front part (drive cover) that has be removed to install or remove a 5.25-inch optical device,
- the rear part (logic cover) that has to be removed to install or remove DIMMs or PCI boards.

This section explains how to:

- Remove and install the drive cover
- Remove and install the logic cover.

Removing and Installing the Drive Cover

Open the drive cover when installing/removing a fan assembly, a processor, and backup file device, or reconnecting an internal cable.

Removing the Drive Cover

1. Read section [“Preparing Your Server for Upgrade” on page 105](#).
2. Pull out the server from the rack.
3. Slide the drive cover toward the rear of the server while pressing the lock button on the cover.
4. Lift off the drive cover from the server.

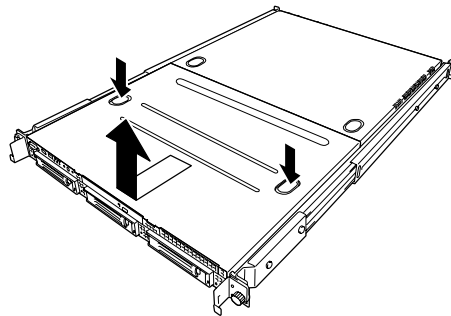


Figure 49: Removing the Drive Cover from the Chassis

Installing the Drive Cover

1. Install the drive cover, check that the tab of the cover is securely inserted into the slot in the server frame.

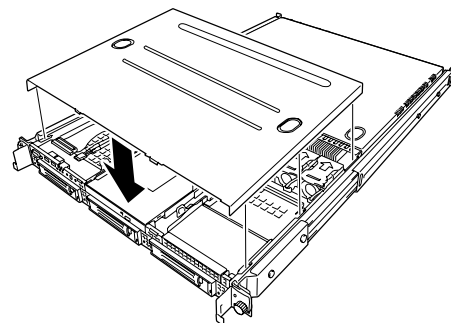


Figure 50: Installing the drive cover

2. Slide the drive cover toward the rear of the server until you hear a “click”.
The drive cover is locked.
3. Check the release button for normal state.

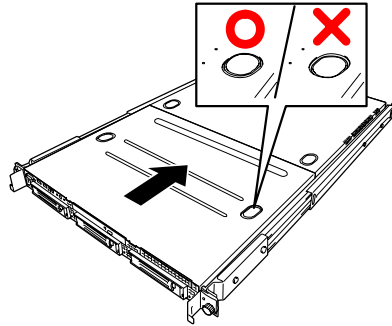


Figure 51: Chassis release button

Removing and Installing the Logic Cover

Open the logic cover when installing/removing a DIMM, processor, and PCI add-in card or reconnecting an internal cable.

Removing the Logic Cover

1. Read section [“Preparing Your Server for Upgrade” on page 105](#).
2. Pull out the server from the rack.
3. Remove the captive thumbscrew at the rear of the server (see Figure 4 - 5 below).
4. Slide the logic cover toward the rear of the server and lift off the cover from the server.

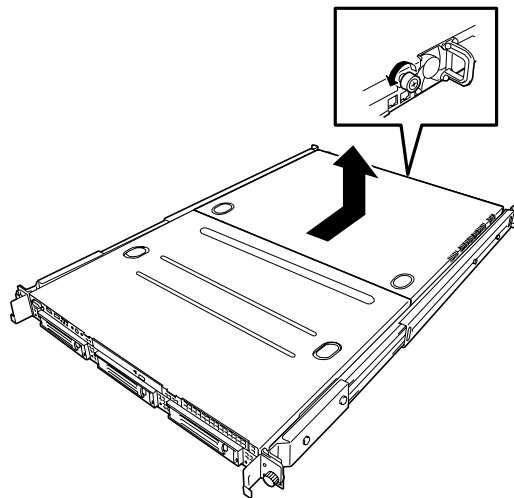


Figure 52: Removing the Logic Cover

Installing the Logic Cover

1. Slide the logic cover toward the rear of the server and secure the cover with the captive thumbscrew.

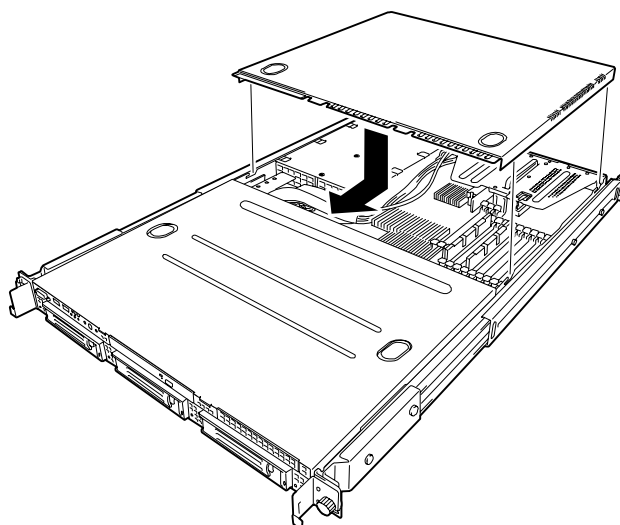




Figure 53: Installing the Logic Cover

2. Check that the tab of the cover is securely inserted into the slot in the server frame.

 *Note: If the logic cover cannot be closed firmly, remove the drive cover before installing the logic cover.*

Installing or Removing Random Access Memory

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

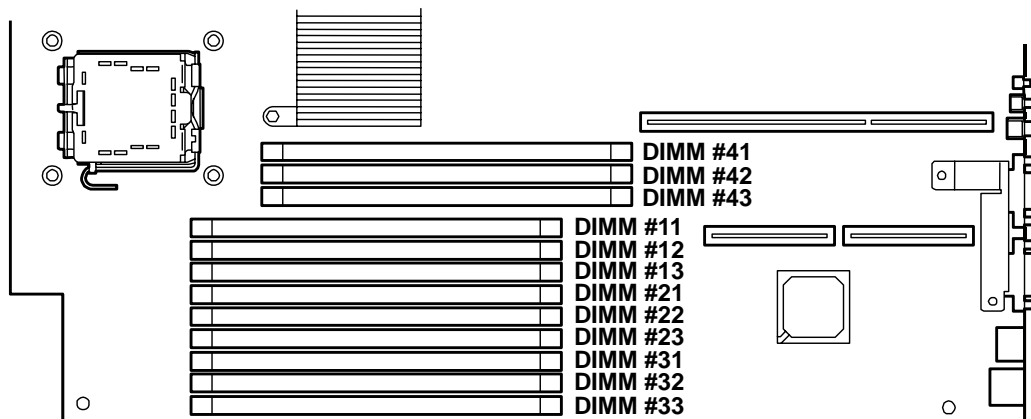
 *Note: Up to 48 GB of memory (4 GB DIMM x 12) can be installed. (The DIMMs installed as standard need to be replaced in this case.)*

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” on page 103.](#) for details about the static electricity.
 - Use a DIMM approved by Bull. If an unapproved third party's DIMM is installed in the server, the DIMM and the server may be defected. You will be charged by any repair of a malfunction or defect caused by such a device within the warranty period.
-

DIMMs Installation Order

DIMMs must be populated in pairs and in the following order: Group #1, #2, #3, #4, #5 and #6.



Order	Group	Sockets N°
1	1	#11 and #21
2	2	#31 and #41
3	3	#12 and #22
4	4	#32 and #42
5	5	#13 and #23
6	6	#33 and #43

Figure 54: Locating the DIMM Sockets

Caution

- Install matched pairs of DIMMs equal in speed and size.
- Refer to [“Using the Memory RAS Features” on page 126](#) to configure the memory mirroring and online spare memory features.

Installing DIMMs

Caution

The server supports DIMMs of only the low-profile type (30 mm (1.2 inches) in height). It does not support DIMMs exceeding the specified height.

To install a DIMM module:

1. Read section [“Preparing Your Server for Upgrade” on page 105](#).
2. Pull out the server from the rack.
3. Open the logic cover. See [“Removing the Logic Cover” on page 121](#).
4. Locate the socket in which a DIMM module is installed.
5. Open the levers at both ends of the socket.

Caution

To avoid damaging the lever, do not apply an excess force onto the lever.

6. Align the new module with an empty memory socket. Make sure the notch on the module aligns with the key in the socket. The module is designed to install into the socket in only one way.
7. Press the DIMM module firmly into the socket. If the DIMM is inserted into the DIMM socket, the lever is automatically closed.

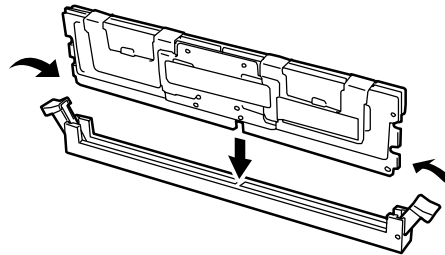



Figure 55: Inserting the module

 **Note:** Make sure of the orientation of the DIMM. Position the DIMM so that a notch in the bottom edge of the DIMM aligns with the keyed socket. Applying too much pressure can damage the socket. Keyed DIMMs insert only one way.

8. Make sure the locking clips at either end of the module click closed. If the brackets don't secure themselves to the module, carefully remove the module, then reinstall it.
9. Replace the logic cover.
10. Install the server on the rack.
11. Power on the server and verify that POST displays no error messages.
12. If POST displays an error message, take a note on the message and see [“POST Error Messages” on page 180](#).
13. Start the SETUP and select [Advanced] > [Memory Configuration] to check that the installed DIMM shows the status "Normal". (See [“BIOS Setup Utility” on page 67](#) for more details.)

14. Select "Yes" for [Reset Configuration Data] on the [Advanced] menu.
This setting is required to change the hardware configuration data. (See [“BIOS Setup Utility” on page 67](#) for more details.)
15. If the Windows operating system is in use, set the paging file size to the recommended value (total memory size × 1.5) or a greater value.

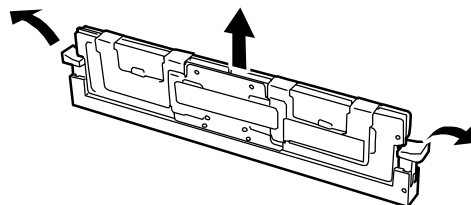
Removing DIMMs

Notes:

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

To remove a DIMM module:

1. Read section [“Preparing Your Server for Upgrade” on page 105](#).
2. Pull out the server from the rack.
3. Open the logic cover. See [“Removing the Logic Cover” on page 121](#).
4. Open the levers at both sides of the socket from which you remove the DIMM.
The DIMM is unlocked and ready for removal.



5. Replace the logic cover.
6. Install the server on the rack.

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.

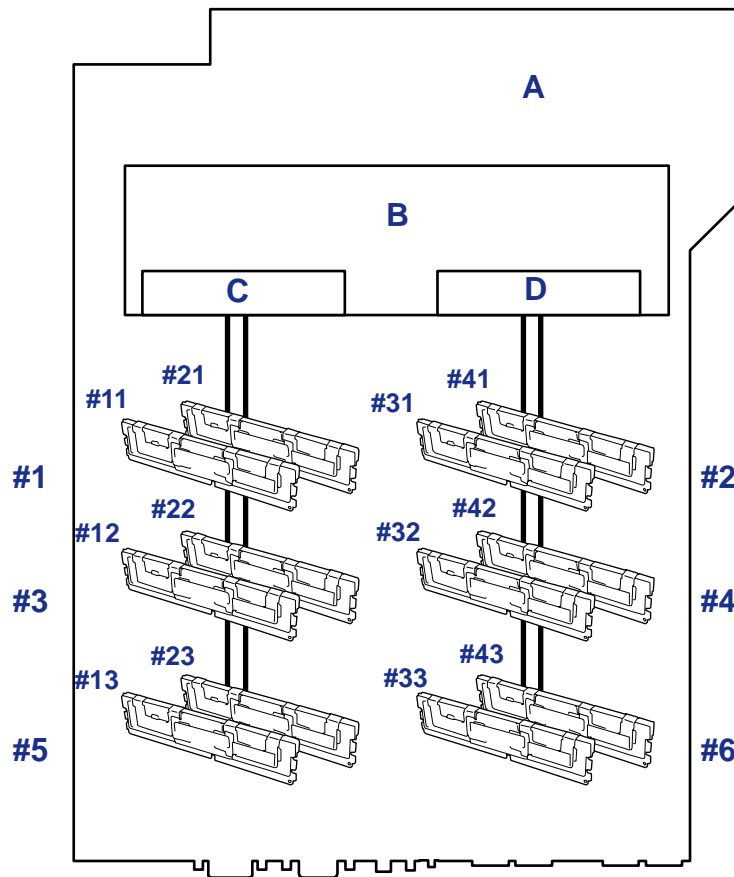


Figure 56: Memory Branches

- 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.

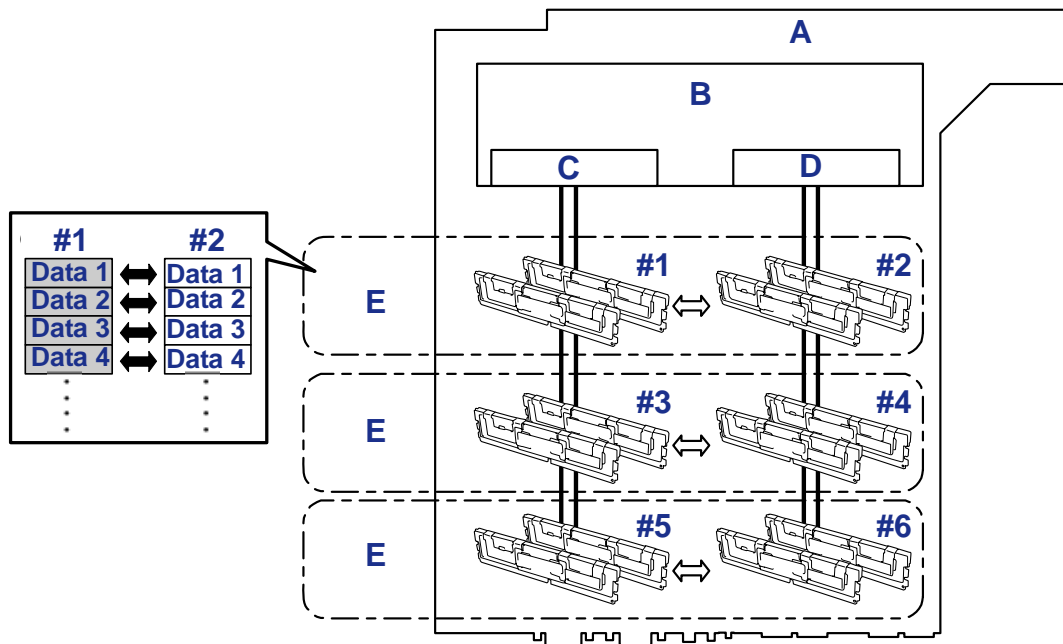



Figure 57: Memory Mirroring

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.

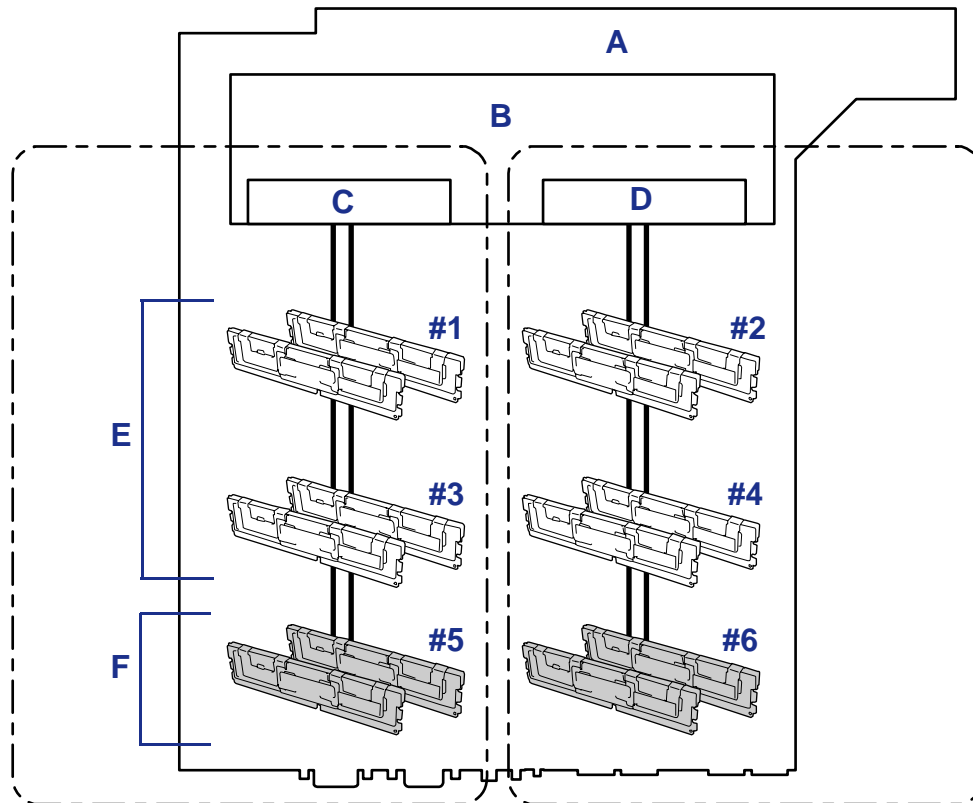


Figure 58: Online Spare Memory

- 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)

Installing and Removing a Microprocessor

The server may have another CPU installed in addition to the standard CPU (Intel® Xeon™ Processor).

Caution

- The CPU is easily affected by static electricity. Touch the metal frame of the server to discharge static electricity from your body before handling the CPU. Do not make bare hands contact with the CPU pins. Do not place the CPU directly on the desk. [See “Static Precautions” on page 103.](#) for details about the static electricity.
 - Do not operate the server until confirming that the additionally installed CPU is in normal state.
 - Use a CPU approved by your sales representative. If an unapproved third party's CPU is installed in the server, the CPU and the server may be defected. You will be charged by any repair of a malfunction or defect caused by such a device within the warranty period.
-

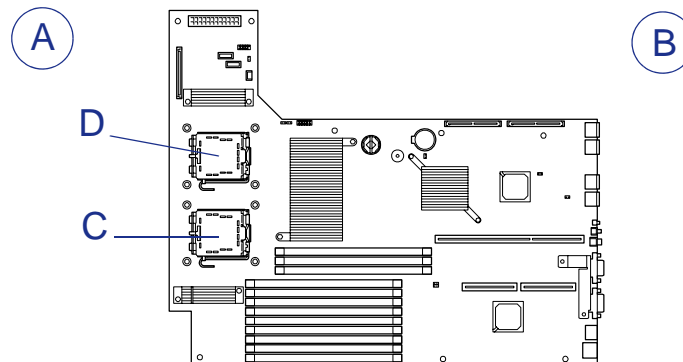

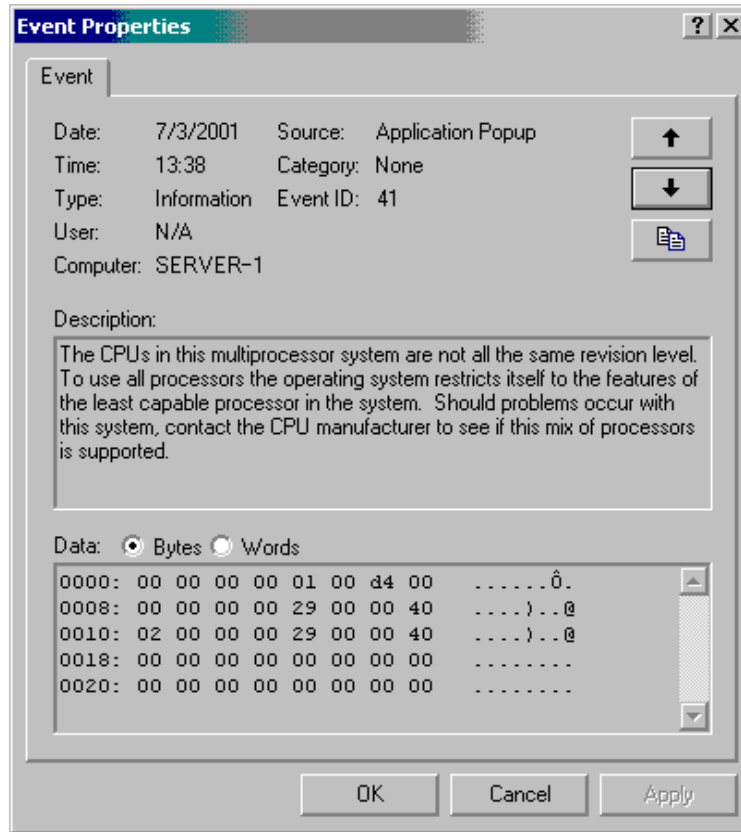


Figure 59: Processor Slots

A - Front B - Rear
C - Processor 1 D - Processor 2

 *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 Server for Upgrade” on page 105](#).
2. Pull out the server from the rack (See [“Removing the Server from the Rack Assembly” on page 57](#)).
3. Remove the drive cover ([“Removing the Drive Cover” on page 119](#)) and the logic cover ([“Removing the Logic Cover” on page 121](#)).
4. Remove the processor air duct from the chassis.

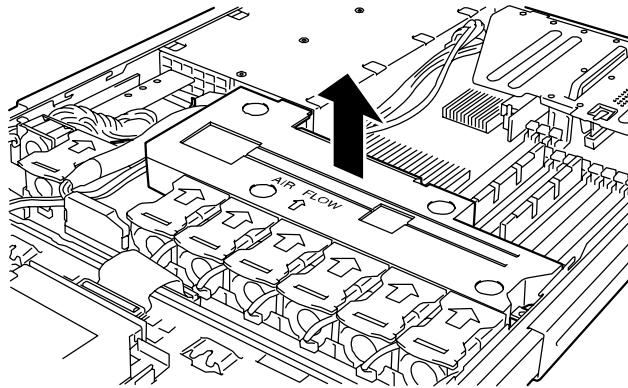


Figure 60: Removing the Processor Air Duct

5. Locate the CPU socket which you are going to install CPU.
6. Remove the protective socket cover from the load plate.

Caution

Do not discard the protective socket cover. Always replace the socket cover if the processor is removed from the socket.

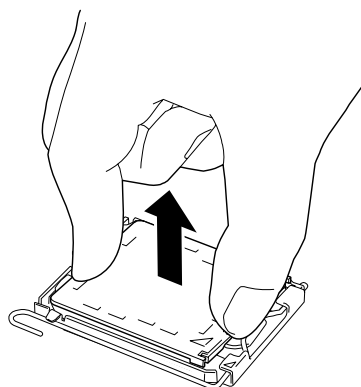


Figure 61: Removing the Protective Socket Cover

7. Open the socket lever by pushing the lever down and away from the socket.

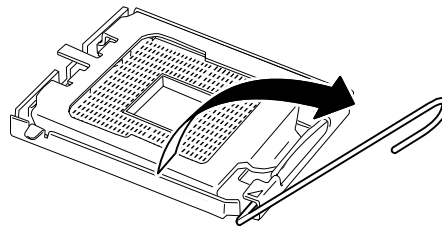


Figure 62: Unlocking the Socket

8. Lift The Load Plate.

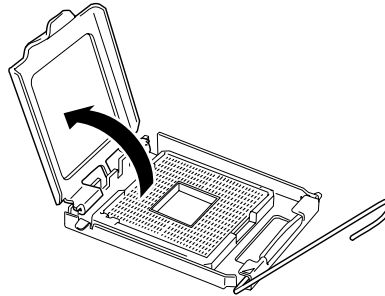


Figure 63: Lifting the Load Plate

⚠ Caution

Do not touch the socket contacts.

9. Remove the processor from the protective cover.

⚠ Caution

- Hold the processor only at the edges, being careful not to touch the bottom of the processor.
 - Do not discard the protective processor cover.
 - Always replace the processor cover if the processor is removed from the socket.
-

10. Hold the processor with your thumb and index fingers oriented as shown in the figure below.

⚠ Caution

Make sure fingers align to the socket cutouts.

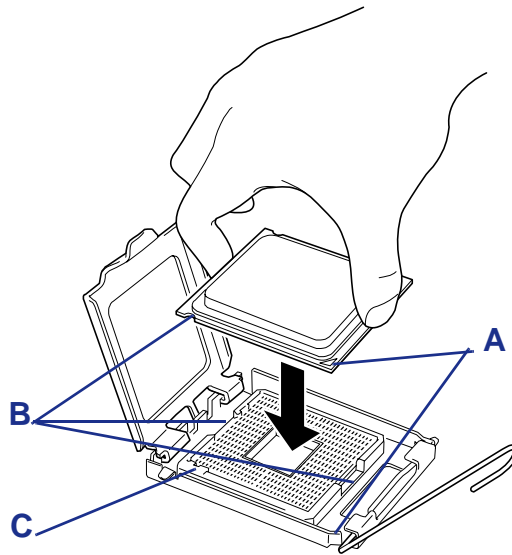


Figure 64: Holding the processor

A: Pin Marker
B: Notches
C: Key

11. Align notches with the socket.
12. Lower the processor straight down without tilting or sliding it in the socket.
13. While pressing down on the load plate, close and engage the socket lever.

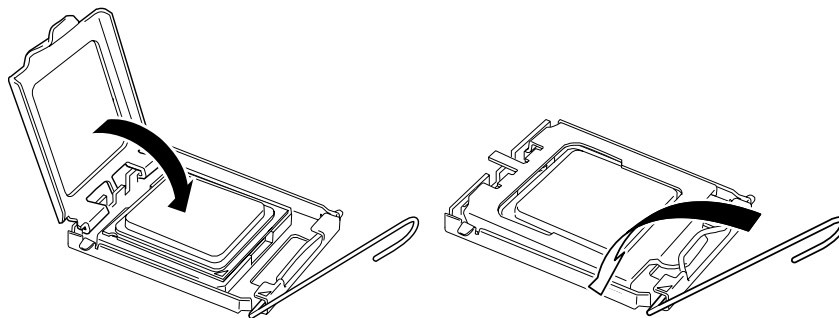


Figure 65: Socket Lever

- Put the heat sink on CPU and fix the heat sink with four screws.

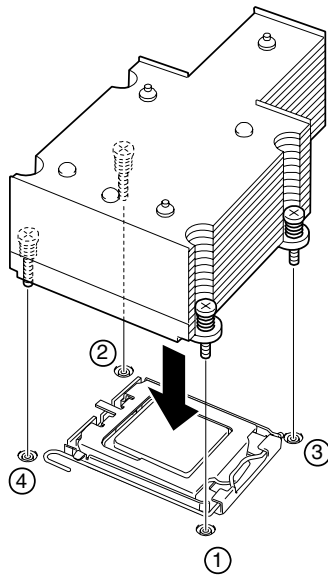

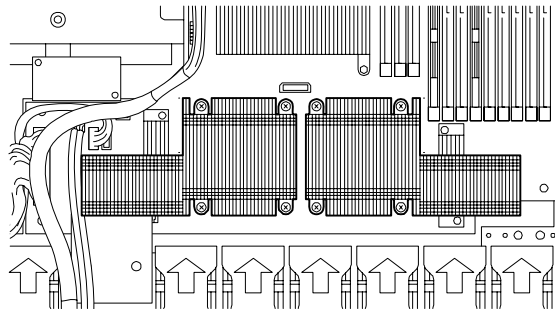


Figure 66: Securing the Heatsink

 **Note:** Take care of the direction of the heat sink (see figure below)..



- Make sure that the heat sink is level.

 **Notes:**

- If the heat sink is not level, remove it, and then install it again. The following probably causes the heat sink not to be level:
 - –The CPU is not positioned correctly.
 - –All screws are not completely tightened.
- Do not move the secured heat sink.

16. Lay the USB cables as shown in the figure below.

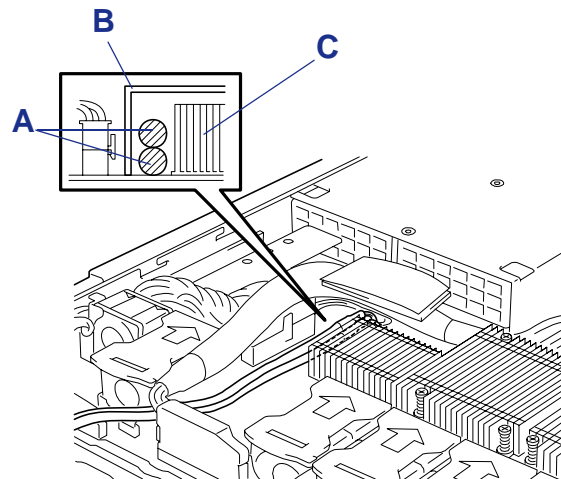


Figure 67: Routing the USB cables

A: USB cables
B: Processor duct
C: Heatsink

17. Install the processor air duct.

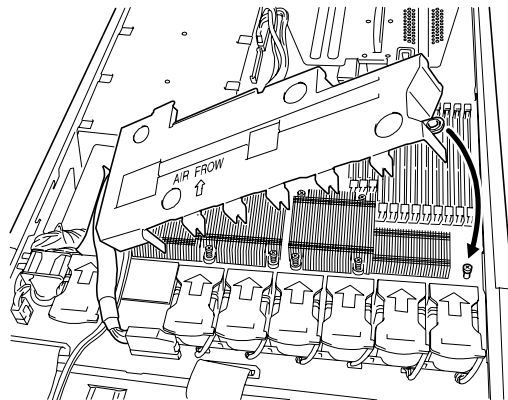


Figure 68: Installing the CPU Duct

 Note:

- Place the internal USB cable inside the processor duct (see figure above).
- Check to see that the processor duct is firmly installed with no clearance between the duct and chassis.

- Put the hard disk drive signal cable under the sub-board as figure below.

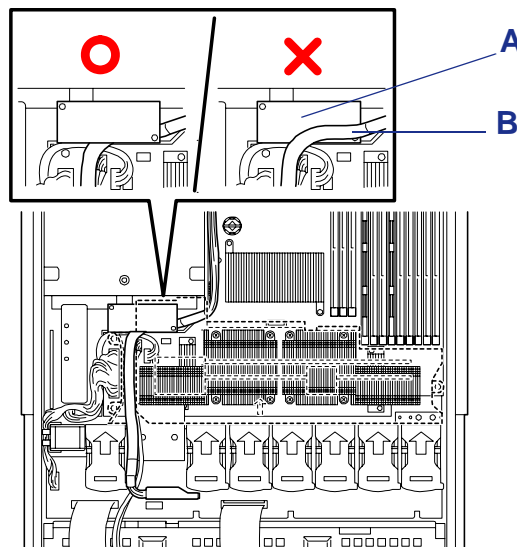


Figure 69: Routing the cable

A: Sub-board

B: Hard disk drive signal cable

18. Install the covers you removed previously.
19. Power on the server, start the SETUP utility, and set "Processor Retest" of "Processor Settings" on the Main menu to "Enable".
20. Set "Reset Configuration Data" on the Advanced menu to "Yes".
This setting is required to change the hardware configuration data. See [“BIOS Setup Utility” on page 67](#) for details.
21. Verify that POST displays no error messages.
If POST displays an error message, take a note on the message and see the POST error messages listed in [“POST Error Messages” on page 180](#).
22. To add one CPU to the server in 1-CPU configuration to operate the server with more than one CPU, change the driver of [Computer] in the device manager to [ACPI multi-processor PC] and then update the system.

Removal

To remove the CPU, prepare the removal referring to steps 1 and 12 in the installation procedure and do the reverse procedure of steps 17 to 9.

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 slightly to make sure that the heat sink can be apart from the CPU. Removing the heat sink with it adhering to the CPU may cause the CPU and/or socket to be defected.

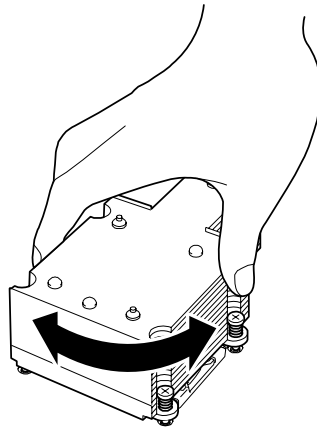


Figure 70: Removing the Heat Sink

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

1. Start BIOS Setup to select menus "Main" – "Processor Settings" – "Processor Retest" in the order to clear the error information on the removed CPU (see ["BIOS Setup Utility" on page 67](#)).

When a CPU is replaced, select menus "Main" – "Processor Settings" to check that the ID and L2 Cache of the additional CPU are defined normally (see ["BIOS Setup Utility" on page 67](#)).

2. Set "Reset Configuration Data" on the Advanced menu to "Yes."

This is required to update the hardware configuration information. See ["BIOS Setup Utility" on page 67](#) for details.

Installing and Removing a PCI Board

The server has a riser card assembly on the motherboard that enable installation of PCI boards. The riser card assembly can hold up to two PCI boards.

Insert PCI boards for network extension and file device function extension into PCI board slots in each riser card.

Caution

- The PCI board is sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the PCI board. Do not touch the PCI board terminals or on-board parts by a bare hand or place the PCI board directly on the desk. See [“Static Precautions” on page 103](#).
 - Some restrictions are imposed on the combination of PCI boards which can be installed in the server. Contact your sales agent for details.
 - A riser card is designed for installing only low-profile PCI boards or full-height PCI boards. Before installing a PCI board, make sure of the card specification.
-

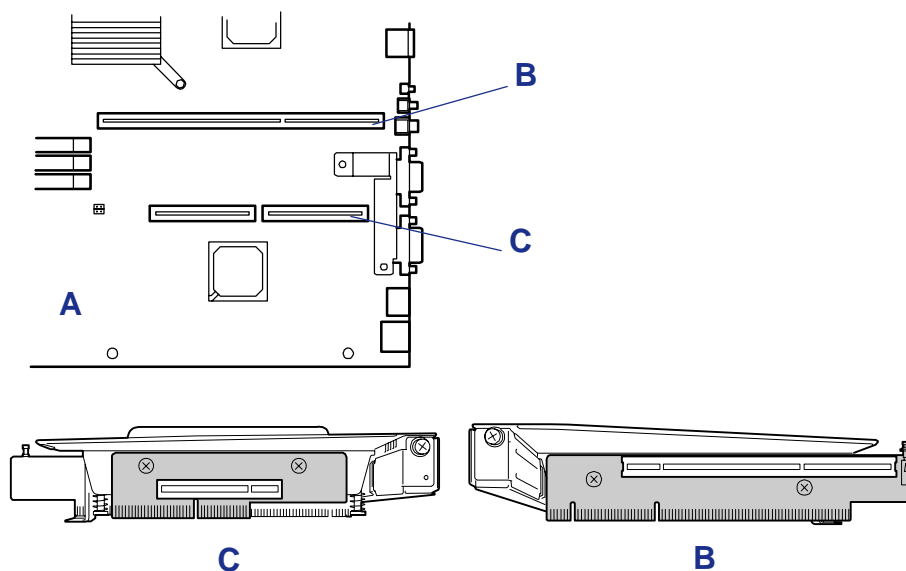



Figure 71: PCI slots

A: Motherboard

B: Riser card slot (dedicated to full-height PCI boards) - slot number 1B

C: Riser card slot (dedicated to low-profile PCI boards) - slot number 1C

 Notes: Observe the following notes on installing/removing a PCI board:

- Do not touch the terminals of the riser cards and the leads of electronic components with your bare hand. Fingerprints and dust left on them cause the server to malfunction due to a connection failure or damage to the leads.
- A riser card is designed for installing only low-profile PCI boards or full-height PCI boards. Before installing a PCI board, make sure of the card specification.
- The system detects the boot devices in order of the PCI bus slots 1B (full-height PCI board) and then 1C (low-profile PCI board).
- The PCI devices of the same type (including onboard PCI device) may be recognized in different order from that described above, depending on the OS or the disk array BIOS utility. Check the slot location of PCI device by PCI bus number, device number and function number shown in the table below.

	Bus number	Device number	Function number
Onboard NIC1	2	1	0
Onboard NIC2	2	1	1
Onboard HDD	D	5	0
Slot 1C	18	0	X
Slot 1B	D	3	X

* On certain PCI devices, other bus numbers may be assigned.

- Set "Disabled" for the optional ROM of a LAN device not to be booted by using the BIOS SETUP utility.
 - If an additional LAN device is installed, it is hard to push the catch of the connector with your finger that is connected to the LAN port. Disconnect the connector pushing the catch with a standard screwdriver. At this time, be very careful for the screwdriver not to damage the LAN port or other ports.
 - If a bootable PCI board (e.g., a disk array controller, SCSI controller, or LAN card) is additionally installed, the boot priority is changed. After the additional installation, start the BIOS SETUP utility, select [Boot] and set the new boot priority.
 - Contact your service representative for the acceptable optional PCI board.
-

Installing a PCI Board

Caution

- The full-height riser card is equipped with an "insulator (black)" to protect PCI boards. Do not remove the insulator, and handle it carefully. The insulator is not shown in the figures in this guide for simplifying the illustrations.
 - Each riser card supports low-profile or full-height PCI boards. Before installing a PCI board, check the type of the PCI board.
 - When installing a PCI board, check that the card connector matches the connector of the riser card.
-

To install a PCI board on the riser card:

1. See the section [“Preparing Your Server for Upgrade” on page 105](#).
2. Pull out the server from the rack (see [“Removing the Server from the Rack Assembly” on page 57](#)).
3. Remove the drive cover and the logic cover.
4. Grasp a handle on the riser module assembly and lift straight up and remove the riser module assembly from the server.

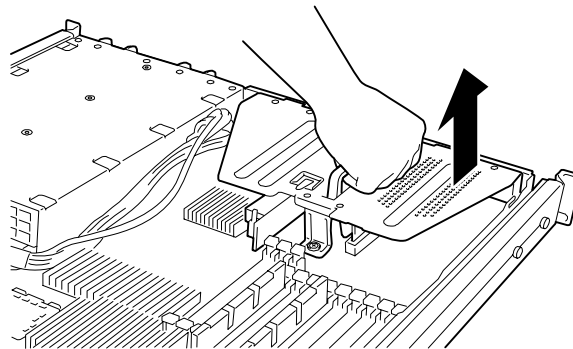


Figure 72: Removing the Riser Card Assembly

5. Remove the screw from the riser card and remove the extension slot cover.

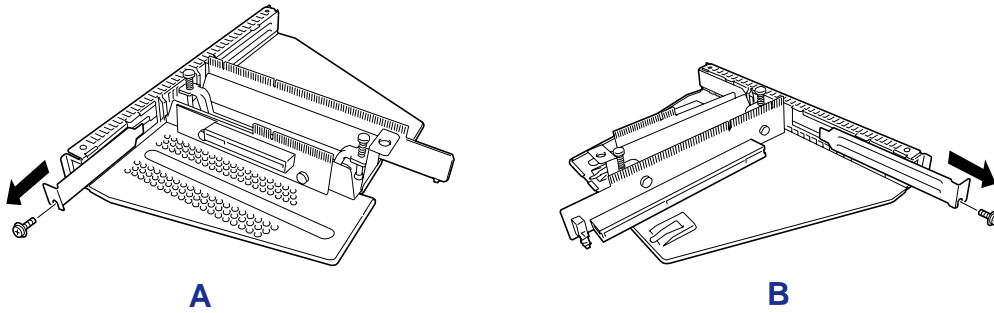


Figure 73: Removing the extension slot cover

A: Low-Profile type

B: Full-height type

6. Install the PCI board on the riser card.
Align the PCI board terminal section with the riser card slot, and firmly push the PCI board until it is fully seated.

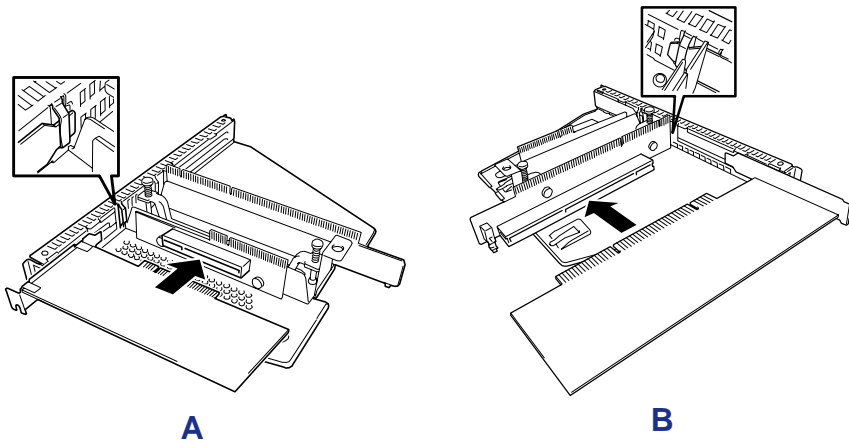



Figure 74: Installing PCI Boards into the Riser Cards

A: Low-Profile type

B: Full-height type

Caution

- Do not touch the terminals of the riser cards and PCI boards with your bare hand. Fingerprints and dust left on them cause the server to malfunction.
 - If you are unable to install a PCI board correctly, remove it, and then install it again. Be careful not to apply excess force to a PCI board or riser card. Doing so may damage the card.
-

 *Note: Check that the end of the PCI board bracket is inserted in the frame slot of the riser card.*

7. Secure the PCI board with the screw you removed in step 5.

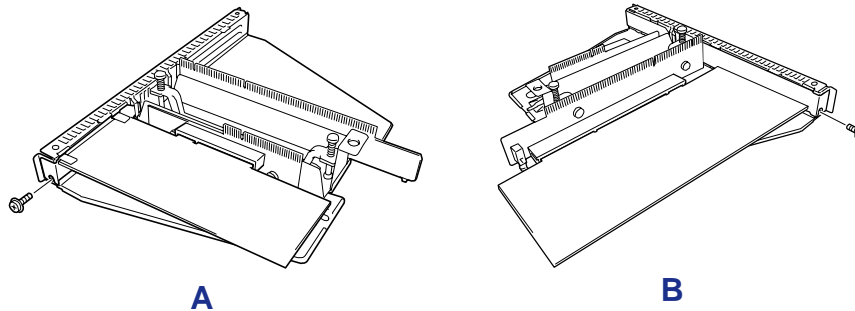


Figure 75: Securing the PCI Board

A: Low-Profile type

B: Full-height type

Caution

This step is to protect the terminals of the riser card from dust or fingerprints. Dust and fingerprints left on them cause the server to malfunction.

8. Insert the riser card assembly into the slot on the motherboard. Align the riser card terminal section with the slot on the motherboard, and firmly push the riser card until it is fully seated.

 *Notes:*

- *There are catches on the riser card frame that are used to secure the riser card to the cabinet. When inserting the riser card, confirm that the catches are correctly fit into the holes on the rear of the cabinet. After the insertion, push the riser*

card with your fingers until you cannot see any part of the riser card terminal section. The riser card is now fully seated in the slot.

- Pay attention not to damage the components on the motherboard with the riser card when inserting it into the slot.

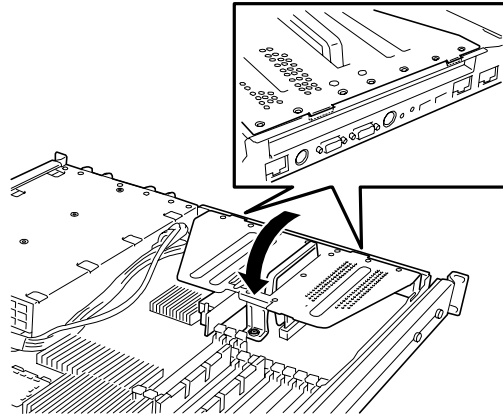


Figure 76: Inserting the Riser Card Assembly into the Motherboard

9. Install the components you removed previously.
10. Verify that POST displays no error messages.
11. If POST displays an error message, take a note on the message and see the POST error messages listed in [“POST Error Messages” on page 180](#).
12. Run the BIOS SETUP utility and select "Yes" for [Advanced] ® [Reset Configuration Data].
This setting is required to change the hardware configuration data. See [“BIOS Setup Utility” on page 67](#) for details.

Removing a PCI Board

Remove a PCI board in reverse order of the installation steps.

Installing and Removing a Raid Controller Board

Using the optional RAID controller allows you to use hard disks in the device bays of the server and those in the optional expansion disk cabinet in the disk array configuration.

Caution

- The disk array controller board is extremely sensitive to static electricity. Make sure to touch the metal frame of the Server to discharge static electricity from your body before handling the disk array controller board. Do not touch the disk array controller board terminals or on-board parts by a bare hand or place the disk array controller board directly on the desk. For static notes, see [“Static Precautions” on page 103](#).
- Making hard disks in the disk array configuration or changing the RAID level initializes hard disks. If the hard disk to be configured in the array has your valuable data stored, make sure to make a backup copy of the data before installing the disk array controller board and configuring the array.
- The disk array configuration requires at least two hard disks.
- Use hard disks of the same capacity and performance (e.g., revolution) for each pack to configure them in the array.

Notes:

- *Before installing a disk array controller board, start the SETUP utility, select [Advanced] → [PCI Configuration], and check that [Enabled] is set for the parameter [PCI Slot xx ROM] (xx: PCI slot number).*
- *Your motherboard includes a RAID controller supporting RAID0 and RAID1.*
- *A disk array configuration of RAID1 or RAID5 increases disk reliability. However, the actually available capacity becomes smaller than the total hard disk capacity in the disk array configuration.*

Installing a SCSI RAID Controller Board

See [“Installing a PCI Board” on page 143](#).

Use of internal hard disk drives in a disk array configuration

Onboard RAID Controller (RoMB)

A RAID controller is factory embedded in your mother board. Refer to [“RAID Configuration” on page 83](#) to enable the controller.

Optional RAID Controller

Your server can include an optional PCI add-in RAID controller. The optional RAID controller can control the internal hard disk drives as a RAID drive.

To use the internal hard disk drives in a disk array configuration with an optional RAID controller, reconnect the hard disk drive interface cable on the motherboard. At the factory, the interface cable is connected to the motherboard connector as shown below.

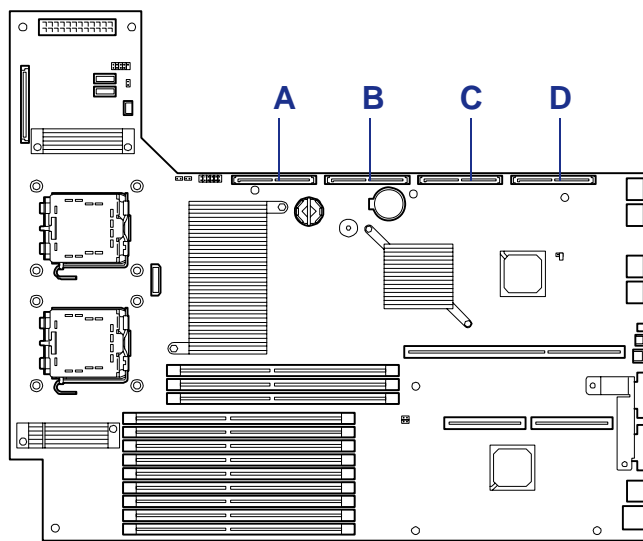


Figure 77: Hard disk drive connectors

- A: SATA connector 2 (not used)
- B: SATA connector 1 (for ports 0 to 2)
- C: SAS connector 2 (not used)
- D: SAS connector 1 (for ports 0 to 2)

 Notes:

- The SAS connectors are mounted only on the SAS hard disk drive model.
 - The SATA connectors are mounted only on the SATA hard disk drive model.
-

Change the cable connection as the following procedures.

1. Remove the end of the interface cable that is plugged into the SAS (or SATA) connectors on the motherboard.

2. Reinstall the end of the interface cable just removed into the connector on the RAID controller.

Caution

Connect the cables to the disk array controller before installing the PCI riser module assembly to the chassis.

Cabling diagram example for the SATA hard disk drive model

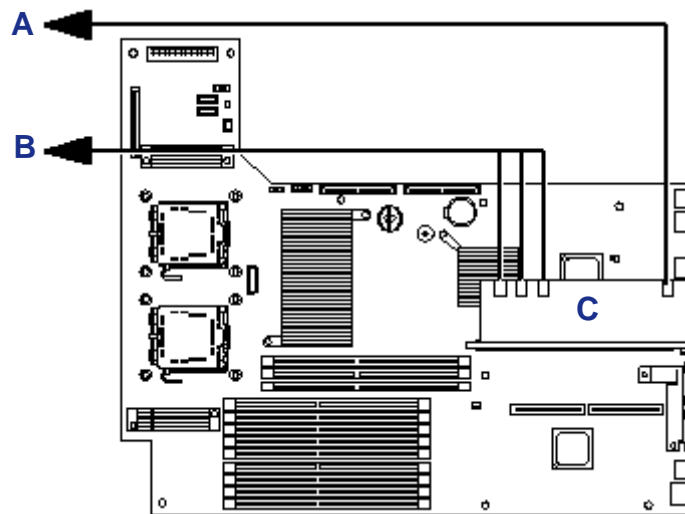


Figure 78: SATA cabling diagram

- A: I2C cable (to the backplane)
- B: Interface cable (to the backplane)
- C: Optional RAID controller

Cabling diagram example for the SAS hard disk drive model

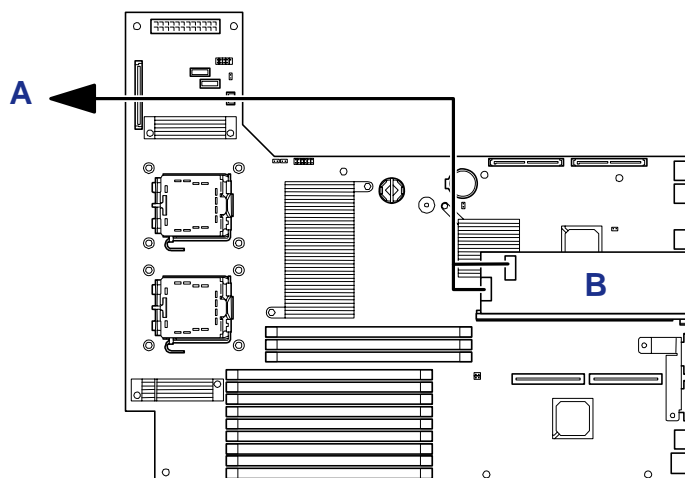


Figure 79: SAS cabling diagram

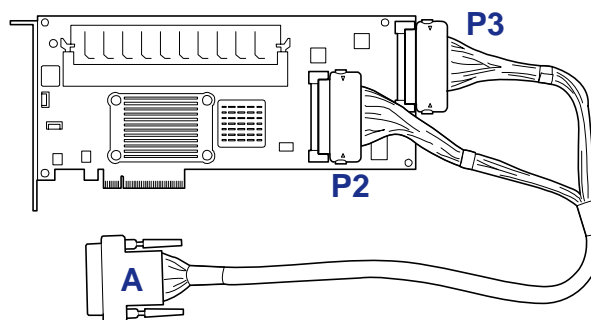
- A: Interface cable (to the backplane)

B: Optional RAID controller

Caution

Notes on using the LSILogic MegaRAID SAS 8408E disk array controller (internal SAS HDD):

Pay attention to connect the interface cable to the proper cable connectors P2 and P3. Otherwise, the SAS port number for the hard disk drive may not be displayed correctly (see figure below).



A: to the backplane

Disk array configuration of internal hard disk drives

- The installed hard disk drives must be the same capacity and the same rotational speed. The minimum number of required disks depends on the configuration of RAID (Redundant Arrays of Inexpensive [Independent] Disks).
- Select/set a RAID level "RAID0", "RAID1", or "RAID5" of disk array configuration.

When installing a system in an internal hard disk, you should use "Express Setup" to perform all the procedures for RAID configuration, OS installation, and then OS setup.

Use Express Setup even when not installing a system. Start Express Setup, select [OS Selection] → [Others]. The installer automatically performs all the procedures for RAID configuration, maintenance partition setting, and then maintenance utility installation.

When making the setup in manual mode, use the RAID configuration utility in the chip on the board. You can start the utility during execution of POST that automatically starts immediately after you turn on the server power switch. For details, see the online document in the ExpressBuilder CD-ROM provided with the server. (The utility varies depending on the disk array controller board.) For details on the data transfer rate, RAID, and array configuration, see the manual provided with the disk array controller board as well as the online document.

Disk Expansion Unit

A disk expansion unit is an exclusive device that can install up to 14 hard disk drives. (The number of hard disk drives depends on the model.) The server containing a disk array controller board can connect one or two of these devices. For details on the number of devices connected, see the manuals provided with the disk array controller and disk expansion unit.

Caution

A disk expansion unit is provided with no hard disk drives. You need to purchase hard disk drives separately.

An optional cable may be required to connect with a disk expansion unit. Refer to the manual coming with the disk expansion unit for details.

After connecting the disk expansion unit, use the RAID configuration utility in the chip on the board to set the disk expansion unit in a disk array configuration (RAID0, RAID1, or RAID5). (The utility varies depending on the board.)

For details on settings and the setting methods, see the online document in the ExpressBuilder CD-ROM provided with the server or the manual provided with the board.

While a disk expansion unit is set in a disk array configuration, you can use the "Auto Rebuild" feature of the disk array controller to restore data if one of the hard disk drives installed in the disk expansion unit fails. (Replace the failing hard disk drive while the power is on. (Hot swapping))

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.

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 server after replacing the battery.

To replace the battery on the motherboard:

1. Turn off and unplug the server and any external options connected to the server.
2. Remove the top cover. [See “Removing and Replacing the Top Cover” on page 118.](#)
3. Locate the battery on the motherboard. [See “Motherboard” on page 27.](#)
4. 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 server top cover.
7. Connect external peripherals and power cables.
8. Run Setup to reconfigure server parameters.

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 system board 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 top cover removed can damage your system components.

For proper cooling and airflow, always replace the top cover before powering on your server.

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.

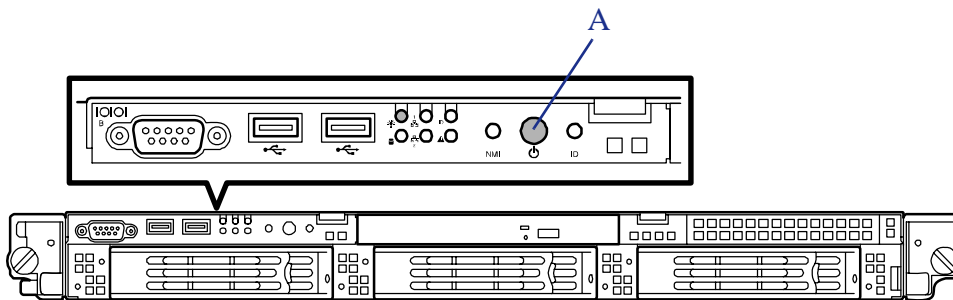
Caution

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 power switch (A) at the front of the server. ([See “Forcing a Power Shutdown” on page 65.](#))



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

This section provides you a guide to identify a problem and locate its source.

Warning

The system power and any peripheral devices should be turned off before connecting or disconnecting peripheral devices to or from the system.

Otherwise, you could permanently damage the system or peripheral devices.

1. Turn off the server and any peripheral devices. Disconnect all external peripherals from the system, except for the keyboard and monitor. The system's power cord must be plugged into a grounded electrical outlet.
2. Make sure your keyboard and monitor are properly connected to the system. Turn the monitor on, then adjust its brightness and contrast controls to suit your preference (see your monitor's documentation).
3. Turn the system on. If the power indicator does not light up, but the system seems to be operating normally, the indicator may need replacement.
4. Monitor the power-on self test (POST) execution. Each time you turn on the system, the POST checks the system board, memory, keyboard, and certain peripheral devices.
5. Check the following during the POST:
 - (Error Message Line 1)
 - (Error Message Line 2)
 - Press **F1** to continue,
 - **F2** to enter Setup
 - You should note the error and press **F2** to resume the boot-up process, or **F1** to enter Setup.
6. Errors that prevent the boot process from continuing (fatal errors) are communicated by a series of audible beeps. If this type of error occurs, record the information and refer to ["Beep Codes" on page 184](#).

System Viewers

Monitor the occurrence of fault by NEC ESMPRO during the system operation.

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

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 system board 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 section earlier in this chapter.

- If you are running software from a diskette or an optical device, 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? Unauthorised copies often do not work. Obtain an authorised copy of the software.
- If you are running the software from an optical device or a diskette, is it a good copy?
- If you are running the software from an optical device, 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 20: 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 system board 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 system board and the front panel. If OK, the light may be defective.</p>

Problems with the Server

Fail to power on the server:

- Is the server is properly supplied with power?
 - Check if the power cord is connected to a power outlet (or UPS) that meets the power specifications for the server.
 - 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: [Advanced] - [AC-LINK]>

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

Fail to power off the server

- Is the power switch enabled?
 - Restart the server and start the BIOS setup utility

- Is the server running in 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.

No screen display appears and beep occurs.

- Is the DIMM board installed securely?
 - Check whether the DIMM board is inserted into the mating connector securely.
 - Check whether DIMMs of different specifications are installed in the specific bank.
 - DIMMs must be populated in pairs and in the following order:
11 and 21, 31 and 41, 12 and 22, 32 and 42, 13 and 23, and 33 and 43.
 - Installed DIMMs must be the same speed and must all be registered.
 - Take a note of beep code pattern, and take appropriate action according to the table listed in [“Beep Codes” on page 184](#).
 - Make sure the jumper switches have been returned to their original positions after CMOS clearing. See "Configuring Mother Board Jumpers" in Chapter 4 for the positions of the jumper switches.

POST fails to complete:

- Is the DIMM board installed?
 - At least two DIMM boards are required for operation.
 - DIMMs must be populated in pairs and in the following order:
11 and 21, 31 and 41, 12 and 22, 32 and 42, 13 and 23, and 33 and 43.
 - Installed DIMMs must be the same speed and must all be registered.
- 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?
 - Some devices connected to the serial or parallel port may require I/O port address or operation mode settings. Refer to the manual that comes with the board for details to make correct settings.

The Power switch and sleep features are disabled:

- Is the POWER switch masked by the BIOS feature?

- The BIOS can disable power-off with the POWER switch after the operating system is started (including shutdown by pressing the POWER switch for at least four seconds).
Run the BIOS SETUP utility to change 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 the BIOS configuration correct?
 - The keyboard and mouse may have been disabled with the BIOS SETUP utility of the server. Check the settings with the BIOS SETUP utility.
- 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 CD-ROM:

- Is the CD-ROM properly set in the DVD-ROM drive tray?
 - The tray is provided with a holder to secure the CD-ROM. Make sure that the CD-ROM is placed properly in the holder.
- Is the CD-ROM applicable to the server?
 - The CD-ROM for Macintosh is not available for use.
 - For the disk which does not conform to the CD standard, the playback of such a disk with the CD drive is not guaranteed.
- Is the optical disc drive bay correctly installed?
 - Reinstall the optical disc drive bay.

Inserted the correct CD-ROM but an error message is displayed:

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

- Is the data side of the CD-ROM dirty or injured?

- Take the CD-ROM out of the DVD-ROM drive, check 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 Bull is not guaranteed.
- Is the hard disk properly installed?
- Is the hard disk properly configured?

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 Bull is not guaranteed.
- Is the cable connection changed?
- 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.
- Is cable length exceeded?
 - Refer to the manual that comes with the SCSI device for details.
- Are the optional SCSI controllers properly configured?
 - 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.

The server is not found on the network:

- Is the LAN cable connected?
 - Make sure to connect the LAN cable to the network port on the rear of the server. Also make sure that the LAN cable to use conforms with the network interface standard.
- Is the BIOS configuration correct?
 - The internal LAN controller may be disabled with the BIOS SETUP utility of the server. Check the setting with the BIOS SETUP utility.
- Have the protocol and service already configured?

- Install the distinctive network driver for the server. Make sure that the protocol, such as TCP/IP, and services are properly specified.

■ Is the transfer speed correct?

- Open the network property dialog box in control panel to specify the "Link Speed & Duplex" value the same as the value specified for HUB.

Wake on LAN does not start from standby state.

■ Is Hub set to Auto-Negotiation? Or, Is the client set to Auto-Negotiation/optimum speed?

- For both hub and client, Wake on LAN does not start from the standby state if the speed is fixed to 1000Mbps.

Problems with Disk Array Configuration

Check the following if the server configured with a disk array does not operate properly or if an utility does not operate correctly.

Fail to display the BIOS banner to run the utility:

■ Is the mother board configured?

- Change the RAID configuration jumper on the motherboard.

Fail to install the OS:

■ Is the disk array controller configured?

- Provide proper configuration for the disk array controller by using the SoftwareRAID Setup Utility (see Chapter 4).

Fail to start the OS:

■ Did the BIOS of the disk array controller change?

- Change the RAID configuration jumper on the motherboard.

■ Does the POST recognize the disk array controller?

- Make sure that the disk array controller is connected correctly, and power on the server.
- The disk array controller on the mother board may be faulty. Contact your service representative.

Rebuild fails:

■ Is the capacity of the hard disk drive to be rebuilt sufficient?

- The hard disk drive to be rebuilt should have a capacity equal to the failed hard disk drive capacity.

- Is RAID0 configured?
 - RAID0 has no data redundancy, and therefore, Rebuild is disabled in the RAID0 configuration. Replace the failed hard disk drive, create the configuration data again and initialize the hard disk drives. Then recover the data by using backup data.

Auto rebuild fails:

- Was a sufficient time taken for hot swap of hard disk drives?
 - To allow the auto rebuild to operate correctly, wait at least 90 seconds between the removal of the failed hard disk drive and the installation of a new hard disk drive.
- Is the configuration correct?
 - Check the auto rebuild settings by using the SoftwareRAID Setup Utility.

A hard disk drive fails:

- Contact your service representative.

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 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 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 DVD-ROM drive first.
<Menu to check: [Boot]>

■ Has an error message appeared?

- When an error occurs while the ExpressBuilder is in progress, the following message appears. After this message appears, check the error and take the appropriate corrective action according to the message listed in the table below.

Table 21: 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

■ Express Setup cannot be used.

Express Setup does not support the installation of Microsoft Windows Server 2003 x64 Editions. Perform “manual setup” if necessary.

■ 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 CD-ROM or checking CD-ROM:

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

- Express Setup terminated and asks to input setup information.
 - There are some errors on the specified setup information. Follow the instruction to input the correct value. It is not necessary to cancel the installation. On Windows 2000, you might be asked to press Enter again after the last reboot of the setup.
- [OK] appears on the [Role of Computer] screen.
 - If you select [OK] here, the setup will select the default value of Express Setup for the later specification to continue the process.

Table 22: Default Value for Windows 2003

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
	MegaRAID Storage Manager (disk array systems)
	Power Console Plus (disk array systems)

- [OK] does not appear on [Role of Computer] screen.
 - [OK] does not appear if the Setup File that has already been created is loaded.
 - [OK] appears only when you first enter the [Role of Computer] screen. Once you go to the next screen from [Role of Computer], the [OK] will not appear even if you enter [Back] to go back to the [Role of Computer] screen.
- Selected [Use Existing Array] at [New/Existing RAID Configuration], but the OS is installed in the whole area of the disk.
 - Is there any other partition than the partition to re-use (excluding maintenance area)? If 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.
- Windows starts with a 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 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.
- Windows is started with Network adapter that has not been specified during Express Setup
 - Windows 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. 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.

Problems with Disk Array Configuration

Refer to the manual supplied with the RAID controller.

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 CD-ROM Autorun feature is supported by Windows NT 4.0 and Windows 95. The older versions do not automatically start from the CD-ROM.
- Is Shift pressed?
 - Setting the CD-ROM with Shift pressed down cancels the Autorun feature.
- Is the system in the proper state?
 - The menu may not appear depending on the system registry setting or the timing to set the CD-ROM. In such a case, start the Explorer and run \MC\1ST.EXE in the CD-ROM.

Problems with Configuration Diskette Creator

- The bit map of the Configuration Diskette Creator window is not displayed correctly during setting of setup information. (When the Trekking command is used)
 - If the specified number of colors is fewer than 256 in the display setting, the bit map is not displayed correctly, but the setup information can be displayed correctly.
- The Point to Point tunneling protocol cannot be set.
 - The protocol is not supported at present. After installation, set the protocol through Control Panel. In this case, rebooting is not necessary.
- The details of a network adapter cannot be set.
 - Configuration Diskette Creator is unable to set the details of network adapters. Start Windows 2003, and set the details through Control Panel.
- More than one network board is connected during setting of setup information, but TCP/IP cannot be set for each network.
 - Perform the installation procedure during DHCP setting. To create a temporary IP configuration, perform the installation procedure during DHCP setting, and then set TCP/IP again through Control Panel.

Problems with Disk Array Configuration

Refer to the manual that comes with the disk array controller for any trouble occurring with the disk array in this 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 sales agent 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.

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

Warning

Do not use a toothpick or plastic stick that could break easily. Do not use any pin easily broken such as a toothpick or plastic pin.

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.

Caution

- The Off-line Maintenance Utility is intended for use of your sales agent. 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 sales agent and follow instructions.
 - Starting the Off-line Maintenance Utility disables any access from a client to the server.
-

Starting the Off-line Maintenance Utility

The Off-line Maintenance Utility may be started in many ways.

Caution

Do not start the Off-line Maintenance Utility while the server is in successful operation.

- From the CD-ROM

Set the ExpressBuilder CD-ROM in the DVD-ROM drive and reboot the system.

After the menu is displayed on the screen, select "Tools" - "Off-line Maintenance Utility".

The Off-line Maintenance Utility program starts from the CD-ROM.

- From the floppy disk

Set the Off-line Maintenance Utility Bootable FD in the floppy disk drive and reboot the system.

The Off-line Maintenance Utility program starts from the boot disk.

The Off-line Maintenance Utility Bootable FD is created by selecting "Tools" - "Create Support FD" on the ExpressBuilder.

- Manual start (by pressing **F4**)

When the Off-line Maintenance Utility is installed, press **F4** while the start-up screen of the server is on screen. The Off-line Maintenance Utility starts from the hard disk.

Off-line Maintenance Utility Features

The Off-line Maintenance Utility provides the following features. (Available features vary depending on the way you started the Off-line Maintenance Utility.)

Caution

See the on-line help for details of the Off-line Maintenance Utility. For further information, ask your sales agent.

■ IPMI Information Viewer

Provides the functions to view the system event log (SEL), sensor data record (SDR), and field replaceable unit (FRU) and to make a backup copy of them.

Using this feature, you can find system errors and events to determine a maintenance part.

■ BIOS Setup Viewer

Provides the functions to export the current configuration data defined with the SETUP utility to a text file.

■ System Information Viewer

Provides the functions to view information on the processor and the BIOS and export it to a text file.

■ System Information Management

Provides the function to make a back-up copy of your data.

Without the backup data, the system-specific information and/or configuration may not be restored.

Only the authorized personnel is allowed to restore the backup data.

■ Start of Utilities

With the ExpressBuilder, you can start the following utilities installed in the maintenance partition.

–System Management

–System Diagnostics


–Maintenance Partition Update

■ Chassis Identify

This function can distinguish the machine with the lamp or buzzer of the machine. This is convenient if you have to distinguish a machine among many machines on the rack.

If You Need Assistance

If you have a problem with your computer, first review the troubleshooting sections of this guide.

 *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.nec-computers.com>.

Error Messages

Error Messages

If an error occurs in the server, an error message appears on the display unit connected to the server.

Error Messages after Power-on


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

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

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

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

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

 *Note: Take a note on the on-screen message before contacting your sales agent. The alarm indication would be a great help for maintenance.*

POST Error Messages

When POST detects an error, it displays an error message on the display unit screen. The following table lists error 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 23: 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.	
02B0	Diskette drive A error.	Start the SETUP to set the "Legacy Floppy A" in the Main menu again. If the same error occurs successively in spite of the resetting, contact your service representative.
02B2	Incorrect Drive A type - run SETUP.	Start the SETUP to provide the setting again. If the error cannot be corrected, contact your service representative.
02D0	System cache error - Cache disabled.	The cache cannot be used. Contact your service representative.

Table 23: POST Error Messages (Continued)

Error code	Error message	Recommended Action
02D1	System Memory exceeds the CPU's caching limit.	Contact your service representative.
02F4	EISA CMOS not writeable.	
02F5	DMA Test Failed.	
02F6	Software NMI Failed.	
02F7	Fail-safe Timer NMI Failed.	
0B22	Processors are installed out of order.	Request the maintenance to replace the CPU.
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.	
0B33	FAN4 Alarm occurred.	
0B34	FAN5 Alarm occurred.	
0B35	FAN6 Alarm occurred.	
0B36	FAN7 Alarm occurred.	
0B37	FAN8 Alarm occurred.	
0B38	FAN9 Alarm occurred.	
0B39	FAN10 Alarm occurred.	
0B3A	FAN11 Alarm occurred.	
0B3B	FAN12 Alarm occurred.	
0B3C	FAN13 Alarm occurred.	
0B3D	FAN14 Alarm occurred.	
0B3E	FAN15 Alarm occurred.	
0B42	Resource conflict	Contact your service representative.
0B43	Warning: IRQ not configured	
0B45	System Configuration Data Write Error	
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.	

Table 23: POST Error Messages (Continued)

Error code	Error message	Recommended Action
8100	Memory Error detected in DIMM group #1.	Contact your service representative to replace the DIMM in the different 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.
8161	Mismatch processor speed detected on processor 2.	
0B80	BMC Memory Test Failed.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B81	BMC Firmware Code Area CRC check failed.	
0B82	BMC core Hardware failure.	
0B83	BMC 1BF or 0BF check failed.	
0B8B	BMC progress check timeout.	
0B8C	BMC command access failed.	
0B8D	Could not redirect the console - BMC Busy -	
0B8E	Could not redirect the console - BMC Error -	
0B8F	Could not redirect the console - BMC Parameter Error -	
0B90	BMC Platform Information Area corrupted.	
0B91	BMC update firmware corrupted.	
0B8A	BMC SEL area full	Clear the system event logs by using the BIOS Setup utility.
0B8F	Could not redirect the console BMC Parameter Error	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B92	Internal Use Area of BMC FRU 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.
0B93	BMC SDR Repository empty.	Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B94	IPMB signal lines do not respond.	This is not a fatal error. Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B95	BMC FRU device failure.	
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 RMC firmware. If the error cannot be corrected, contact your service representative.
0B9B	Private I2C bus not responding.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B9C	BMC internal exception.	
0B9D	BMC A/D timeout error.	
0B9E	SDR repository corrupt.	
0B9F	SEL corrupt.	

Table 23: POST Error Messages (Continued)

Error code	Error message	Recommended Action
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.	
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 “BIOS Setup Utility” on page 67).
	H/W Configuration of BMC is corrupted. !! Update BMC F/W Configuration by configuration tool !! !! Refer to BMC configuration manual !!	Use ExpressBuilder to configure the optional remote management card .

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 1-5-2-1 indicates 1 beep, pause, 5 beeps, pause, 2 beeps, pause, and 1 beeps notifying that a checksum error occurred on ROM.

Table 24: POST Error Beep Codes

Beeps	Error	Recommended Action
1-2	Option ROM initialization error	<ol style="list-style-type: none"> 1. Check if the optional add-in card is properly installed. 2. Run the BIOS setup utility to check the IRQ assignment. 3. Ask your service representative to replace the add-in card or motherboard..
3-3	ROM checksum error	Replace the motherboard.
1-2-2-3		
1-3-1-1	DRAM refresh test error	<ol style="list-style-type: none"> 1. Check if the DIMM is properly installed. 2. Remove the DIMM once, and then re-install it to check if it operates normally. 3. Ask your service representative to replace the failed DIMM or mother board.
1-3-1-3	Keyboard controller error	<ol style="list-style-type: none"> 1. Check if the keyboard is properly connected. 2. Replace the mother board
1-3-3-1	No memory or capacity check error	<ol style="list-style-type: none"> 1. Check if the DIMM is properly installed. 2. Remove the DIMM once, and then re-install it to check if it operates normally. 3. Ask your service representative to replace the failed DIMM or mother board
1-3-4-1	DRAM address error	
1-3-4-3	DRAM test Low Byte error	
1-4-1-1	DRAM test High Byte error	
1-5-1-1*	CPU startup error	<ol style="list-style-type: none"> 1. Check if the CPU is properly installed. 2. Remove the CPU once, and then re-install it to check if it operates normally. 3. Ask your service representative to replace the failed CPU.
1-5-2-1*	No CPU installed	
1-5-4-4*	Abnormal voltage	
2-1-2-3	BIOS ROM copyright test error	Replace the motherboard.
2-2-3-1	Unexpected interrupt test error	

* Beeps only when the optional remote management card is installed in your system.

How to Identify BIOS Revision Level

To identify your system's current BIOS revision level, perform either one or the other of the following procedures:

1. Power-on or reboot the system.
2. When logo displays, press the **ESC** key.
3. The BIOS revision level is displayed. Immediately press **Pause** to have time to read the BIOS version.

or

1. Power-on or reboot the system. "Press <F2> to enter SETUP" displays.
2. Press **F2**.
3. In the **Server** menu, select **System Management** and press **ENTER**. The BIOS revision level is displayed.

Status Indicators

This section explains the indication and meanings of the server lamps.

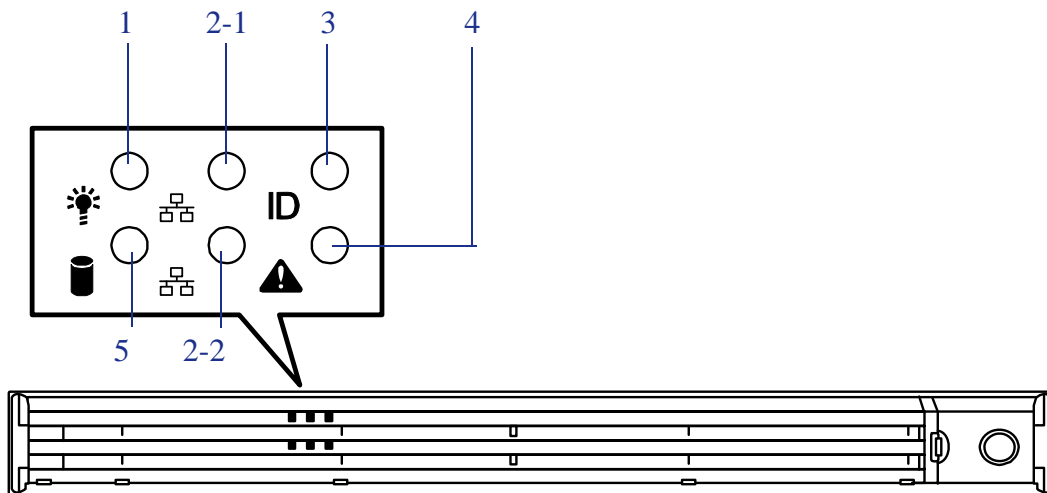


Figure 80: Front Lamps

- 1 Power lamp (green)
- 2 ACT lamp (green)
- 3 UID lamp (blue)
- 4 Status lamp (green)
- 5 Disk access lamp (green/amber)

POWER Lamp

The POWER lamp is on (green) while the server power switch is on. It is off while no power is supplied to the server.

The POWER lamp indicates that the server is running in the power-saving mode (sleep mode). If the OS supports the power-saving mode such as Windows Server 2003, running the command blinks the POWER lamp in green and place the server in the power-saving mode. Press the POWER switch to turn out the POWER 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.

Status Lamp

The STATUS lamp is on (green) while the server is operating normally. (The rear panel also has the STATUS lamp on it.) If the STATUS lamp is off or turns amber and flashes, it indicates that the server is in abnormal state.

The table below explains the STATUS lamp indication, the meanings, and the procedures.

Notes:

- If NEC ESMPRO or the offline maintenance utility is installed, you can confirm the cause of a failure by referring to the error log.
 - If shutdown processing can be performed through the operating system when you want to restart the system after turning the power off, restart the system by performing shutdown processing. If shutdown processing cannot be performed, restart the system by resetting, forcibly turning the power off, or disconnecting and then connecting the power cord.
-

Table 25: Status Lamp Indications

Status lamp indication	Description	Procedure
On (green)	The server is operating normally.	—
Flashing (green)	The server is operating with the memory, CPU, or power supply unit in degraded state. An uncorrectable memory error has often occurred.	Check the AC power lamp indication on the rear panel of the server. Identify the device in degraded state by using the BIOS setup utility "SETUP," and replace it as soon as possible.
Off*	The power is off.	—
	POST is in progress.	Wait for a while. The status lamp turns green when POST is completed.
	A CPU error occurred.	Turn the power off and then turn it on. If the POST screen displays an error message, take notes of the message, and contact your sales representative.
	A CPU temperature alarm was detected.	
	A timeout occurred when the time set for the watchdog timer arrived.	
	A CPU bus error occurred.	
A memory dump request is made.	Wait until the memory dump is completed.	
On (amber)*	A temperature alarm was detected.	Check if the internal fans are clean and if the fan units are firmly connected. If the status lamp indication does not change when the fans are normal, contact your sales representative.
	A voltage alarm was detected.	Contact your sales representative.
	All the power supply units failed.	

Table 25: Status Lamp Indications (Continued)

Flashing (amber)*	A voltage warning was detected.	Contact your sales 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 sales representative.
	A temperature warning was detected.	Check if the internal fans are clean and if the fan units are firmly connected. If the status lamp indication does not change when the fans are normal, contact your sales representative.

* Only when the optional remote management card is installed in your server.

Disk Access Lamp

The DISK ACCESS lamp indicates the status of the hard disk mounted in the 3.5-inch disk bay.

The lamp turns green each time access is made to the hard disk.

When the DISK ACCESS lamp turns amber, it indicates that a hard disk failure has occurred. Check the hard disk lamp for the status of the failing hard disk.

Caution

If a hard disk in the server is connected to the internal disk array controller (which is additionally mounted), the access lamp signal cable (connected to the connector on the mother board) must be connected from the disk array controller to the mother board.

ACT Lamp

The ACT lamp is green while the server is connected to the LAN. The lamp flashes while the server is accessed via the LAN (during transmission/reception of packets). The number next to the icon indicates the network port number on the rear panel of the server.

UID Lamp (UID)

Pressing the UID switch toggles the front panel UID lamp (blue) and the motherboard UID lamp on and off. The motherboard UID lamp is visible through the rear of the chassis and allows you to locate the server you're working on from the rear of the servers on a rack.

Refer to [“Identification of Servers ~ UID Switch ~” on page 24](#) for more information on the UID switch.

Disk Access Lamp

The disk access lamp of the optical device drive is on while the drive is accessed.

Hard Disk Lamp

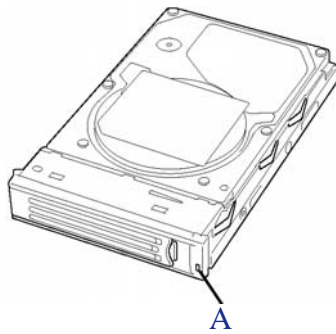


Figure 81: Hard Disk Lamp


The disk lamp (A) located on the drive carrier indicates the following depending on the status:

■ Flashing (green)

The lamp indicates that the hard disk is accessed.

■ On (amber)

The lamp indicates a failure of a hard disk mounted in disk array configuration.

 *Note: Even if one of the hard disks fails in disk array configuration (RAID1 or RAID5), the server can continue operation. However, replace the disk as soon as possible, and perform reconstruction (rebuild) processing. (The failing disk can be replaced in hot swap mode.)*

- Flashing switching back and forth between green and amber

The lamp indicates that reconstruction (rebuild) processing is being performed for the hard disk. (This flashing does not indicate a failure.) When a failing hard disk is replaced in disk array configuration, the system rebuilds the data. (Auto-rebuild function) The lamp switches back and forth between green and amber during rebuild processing.

The lamp goes off when the rebuild processing finishes.
It turns amber when the rebuild processing fails.

Caution

If the server is turned off during rebuild processing, the processing is stopped. Restart the server, mount the new hard disk in hot swap mode, and then perform rebuild processing again. Observe the following notes on using the auto-rebuild function.

- Do not turn the power off. (Once the power is turned off, the auto-build function does not start.)
 - Let 90 seconds or more pass between when dismantling a failing hard disk and when mounting the new one.
 - Do not replace a failing hard disk while rebuild processing is being performed for another hard disk.
-

LAN Connector Lamps

There are two lamps for each of the two LAN ports (connectors) on the rear panel.

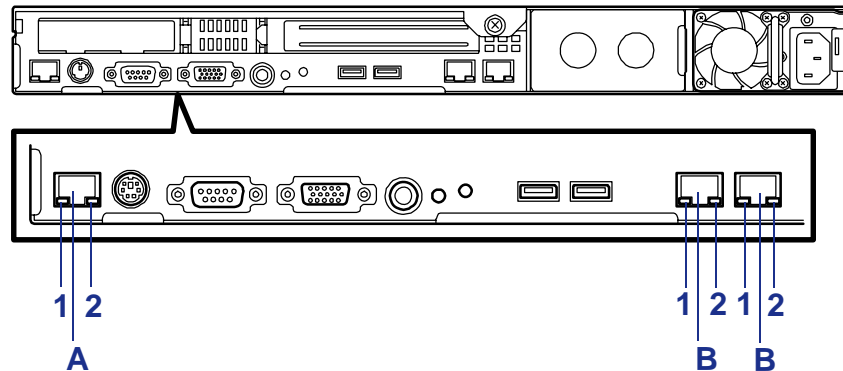


Figure 82: LAN Connector Lamps

- A: Management Port
- B: LAN Port
- 1: LINK/ACT LED
- 2: Speed LED

■ LINK/ACT lamps

Each LINK/ACT lamp indicates the status of the standard network port of the server. While power is supplied to the server and HUB and the connection is correct, the lamp is on (green).

The lamp turns green and flashes while the network port is transmitting/receiving data.

If the lamp does not go on when the LINK state is placed, check if the network cable is in normal state and if it is connected correctly. If the lamp does not go on yet when the network cable is normal, the network (LAN) controller may be faulty. In this case, contact your sales representative.

■ Speed lamp (for data transmission ports)

This lamp indicates whether each of the network ports normally equipped with the server is operated through the 1000BASE-T, 100BASE-TX or 10BASE-T network interface.

If the lamp is lit orange, the network port is operated through 1000BASE-T. If the lamp is lit green, the network port is operated through 100BASE-TX.

If the lamp is off, the network port is operated through 10BASE-T.

■ Speed lamp (for management port)

This LED indicates whether each of the network ports normally equipped with the server is operated through the 100BASE-TX or 10BASE-T network interface. If the LED is lit amber, the network port is operated through 100BASE-TX. If the LED is off, the network port is operated through 10BASE-T.

AC Power LED (SAS Hot-swap Hard Disk Model Only)

There is an AC POWER LED for the power supply unit on the rear. The LED turns green and flashes when the power supply unit receives AC power from the power cord, which is connected to the AC inlet. (Flashing amber indicates no AC power is received in any one of two power supplies in the redundant configuration.)

The LED turns green when the server power switch is turned on. If the LED does not go on when the server power switch is turned on or if it turns amber, the power supply unit is probably faulty. In this case, contact your service representative to replace the power supply unit.

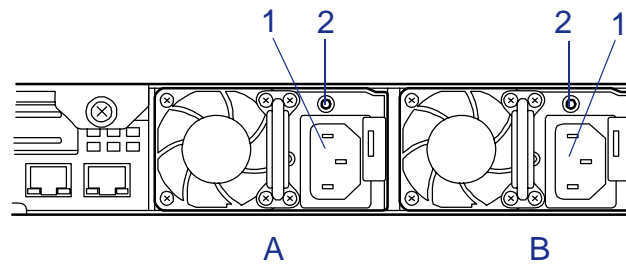



Figure 83: AC Power LED

- A: Power supply slot (option)
- B: Power supply slot (standard)
- 1: AC inlet
- 2: AC Power LED

 *Note: If one power supply unit fails while an optional power supply is mounted, the system can continue operation with the other power supply unit (redundant function). The failing power supply unit can be hot-swapped, that is, replaced without shutting down the system.*

Appendix 1: Specifications

Table 26: Bull NovaScale R440 Specifications

Cabinet design		Rack-mount type (1U)
CPU	Type	Intel® Xeon™ Processor
	Number of processors	1 (max: 2)
	L2 cache	4 MB
Chipset		Intel 5000P (1066/1333 MHz)
Memory	Minimum	1 GB (512MB x 2)
	Maximum	48 GB (The standard DIMM must be replaced.)
	Connectors	12 memory connectors 184-pin wide
	Expansion unit	2 DIMMs (512 MB/1 GB/2 GB/4 GB)
	Expansion times	6 times
	Memory module	SDRAM DIMM (Low Profile DDR2-533 or DDR2-667 Buffered Type)
	Error check	ECC
Graphics (VRAM)		VRAM 2 MB
Hard Disk Drive		SATA: 750 GB (250 GB x 3) SAS: 900 GB (300 GB x 3)
Hard Disk Bay	Interface	SATA2/300 or SAS
	Slots	3
	RAID	RoMB: RAID0/RAID1 Optional: RAID0/RAID1/RAID5
	Hot-swap	Supported if the RAID system is configured
Optical device Drive (standard)		DVD-ROM ATAPI interface x 1 (Load on tray type, x24 speed)
Additional Slots	Low Profile	1 slot PCI-EXPRESS (x8)
	Full Height	1 slot PCI-X (64-bit/100MHz)
External interface	Keyboard/ Mouse	MINI DIN 6-pin connector (1 port)
	USB	4-pin (Front: 2 ports; Rear: 2 ports)
	Serial	DB9 compatible (2 ports)
	Network	10/100/1000BASE-T (2 ports) 100BASE-TX/10BASE-T (1 management port)
	Video	MINI D-Sub 15-pin (1 port)
Power supply		100 to 120 VAC ±10%, 200 to 240 VAC ±10%, 50/60 Hz ±1 Hz SATA: 1 (no redundancy) SAS: 1+1 redundant option hot-swappable
Power consumption (maximum)		660 W
Cooling		15 (redundant, non hot-swappable)
Weight (Max)		SATA: 19 kg SAS: 19 kg
External dimensions		425 (width) × 718* (depth) × 43 (height) mm

Table 26: Bull NovaScale R440 Specifications (Continued)

Environmental requirements	Temperature	10 to 35°C (operating), -10 to 55°C (non-operating, storage)
	Humidity	20 to 80% RH (no condensation)
Others	ExpressBuilder supported, NEC ESMPRO provided in the standard configuration	

* Excluding the front bezel.

Appendix 2:

Interrupt Requests

Table 27: Interrupt Requests

IRQ	Peripheral Device (Controller)	IRQ	Peripheral Device (Controller)
0	System timer	12	Mouse
1	Keyboard	13	Numeric processor
2	-	14	Primary IDE
3	COM2 serial port (PCI)	15	Secondary IDE
4	COM 1 serial port (PCI)	16	USB
5	PCI	17	VGA
6	Floppy disk drive	18	-
7	PCI	19	USB
8	Real-time clock	30	LAN1
9	ACPI compliant system	31	LAN2
10	PCI	49	Onboard SAS/SATA 1
11	BMC IRQ	50	Onboard SAS/SATA 2

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 device 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 External Surfaces of the Server

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.
-

For daily cleaning, wipe the external surfaces of the server with a dry soft cloth

If stains remain on the surfaces:

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 of the Server

One important item 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.

To clean the interior of the server, you will need a small vacuum cleaner (with plastic tipped nozzle and electrostatic protection), a computer grade canned air, and a small brush.

Warning

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 the brush made of chemical fabric, or the cleaning material that will generate an electrostatics.

To clean the interior of the server:

1. Turn off the server and unplug all power cables.
2. Remove the logic cover and the drive cover.
3. Use a small brush to loosen any dust and debris on the mother board.
4. Use computer grade canned air to blow dust off components on the motherboard.
5. Use a small vacuum cleaner with plastic tip to vacuum out dust and debris from the interior of the server.
6. Reinstall the logic cover and the drive cover.
7. Reconnect all power cables and turn on the server.

Cleaning the Keyboard

1. Power off the server and peripheral devices.
The POWER/SLEEP lamp is off.
2. Wipe the keyboard surface with a dry cloth.

Cleaning the Mouse

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.

To clean the mouse:

1. Prepare cold or lukewarm water, neutral detergent, alcohol, two dry soft clothes, and cotton swabs.
2. Power off the server.
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 an Optical Drive and CD-Rom/CD-RW/DVD-Rom

A dust-accumulated tray or a dusty optical drive may cause the device not to read data correctly.

To Clean an Optical Drive:

1. Power the server.
The POWER/SLEEP lamp is lit.
2. Press the optical drive tray Open/Close button on the front of the optical drive.
The tray is opening.
3. Hold the CD-ROM/CD-RW or DVD-Rom and take it out from the tray.

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

4. Wipe the tray with a dry soft cloth.

 **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 on the tray front to close the tray.

To Clean a CD-Rom or CD-RW or DVD-Rom:

Wipe the signal side of the disk with a dry soft cloth.

 **Caution**

- Wipe disks from the center to the outside.
 - Use only CD-ROM cleaner if necessary. Cleaning a CD-ROM or CD-RW or DVD-ROM with record spray/cleaner, benzene, or thinner causes damage to the disk contents. At worst, inserting the disk 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 remove the LAN cable.

Executing the System Diagnostics with the LAN cable connected, the network may be influenced.

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

Starting and Ending the System Diagnostics

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

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. Reboot the server with the ExpressBuilder CD-ROM.
5. Select [Tools].
6. Select [System Diagnostics].

The System Diagnostics starts and completes in three minutes.

When the diagnosis completes, the test window title shows "Test End".

- **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 shown in the bottom of the screen and press **Esc** to show the End user Menu.
 - <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> gives access to the different option menus.
 - <Reboot> restarts the server.
8. Select <Reboot> in the Enduser Menu above.

The Express Server restarts and ExpressBuilder boot the system.
9. Exit ExpressBuilder, and remove the CD-ROM from the optical device 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 cord.

This completes the System Diagnostics.

Appendix 4: 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=

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 \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:

$3500 \text{ MB} + (512 \text{ MB} * 1.5) + (512 \text{ MB} + 12 \text{ MB}) + \text{Application size} = 4792 \text{ MB} + \text{Application size}$

If the required partition size is larger than the size of a hard disk drive, we recommend you split the file across several disks.

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 insert the disk labeled
manufacturer-supplied hardware support disk
into Drive A:
*Press ENTER when ready.

6. Insert the Windows Server 2003 OEM-DISK for 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 214](#) and [“Updating System” on page 204](#).

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 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].

Note on using the Adaptec 29320 Controller Board

It may happen that the driver is not installed during the OS installation.

In that case, please use the following procedure to install the driver.


1. Start [Device Manager] from [Start] menu → [Control Panel] → [Administrative Tools] → [Computer Management].
2. Double-click the SCSI Controller driver in Other device.
3. Click [Update Driver].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select "Don't search. I will choose the driver to install" and click [Next].
6. Click [Have Disk..].
7. Insert "Windows Server 2003 OEM-DISK for EXPRESSBUILDER" into the floppy disk drive, enter "a:\" into "copy manufacturer's file from:" and click [OK].
8. Specify one of the following drivers and click [Next].
 - INITIO INI-A10XU2W PCI SCSI Controller
(When board Initio 101 is installed.)
 - Adaptec SCSI Card 29320ALP-Ultra320 SCSI]
(When board Adaptec 29320 is installed.)

The installation of the driver is completed.

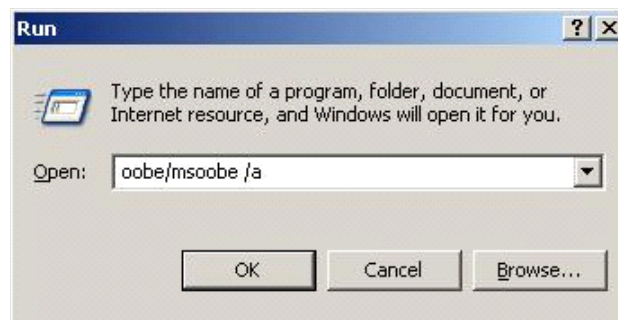
Restart the system when prompted to do so.

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



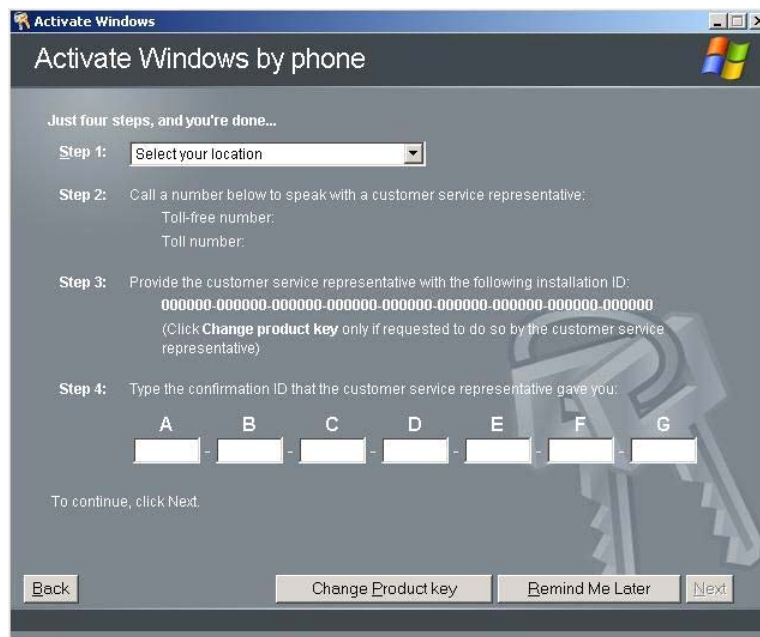
2. Click on [Next] when prompted to do so on the following screen.



The following screen is displayed.



3. Process with the "Windows activation" according to the following message.



Available Switch Options for Windows Server 2003 Boot.ini File

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

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

- Microsoft Knowledge Base - Article ID: 833721

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

If your system 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 5: 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.
 - The dump file size for the system with more than 2GB memory mounted is '2048MB + 1MB'.
 - If you install any application program or the like, add necessary space to the partition to install these programs.
-

For example, if the mounted memory size is 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 x64 Editions (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.

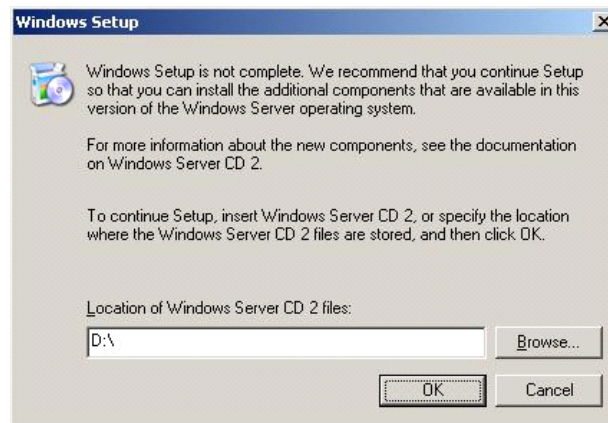
5. When the following message is displayed, press **S**.

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\WS3XPX64
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 232.](#)
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 232](#).
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 converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

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

This feature includes AFT feature.

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 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 6: 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™ 2003.

To install other operating systems, please contact your service representative for more information on the operating systems certified on the server.

 *Note: Before using ExpressBuilder for initial setup, complete the hardware configuration.*


ExpressBuilder includes three distinct programs:

■ 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.

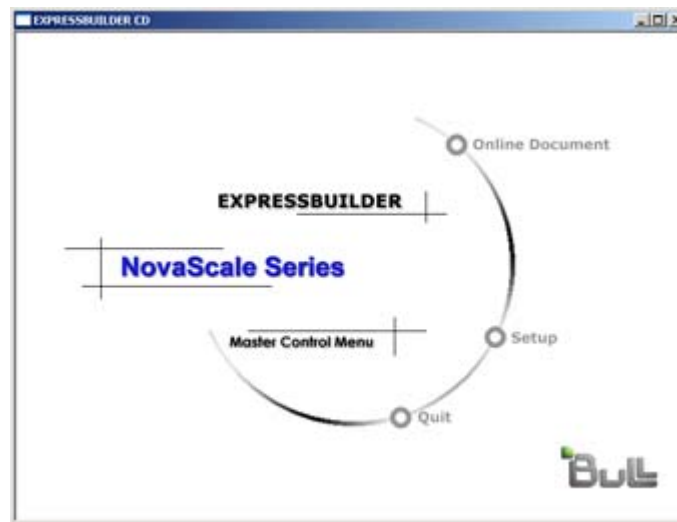
■ DOS-based with remote console

Used to set up the server from the management workstation by accessing the server over the network or via serial port B.

 *Note: The "CSL_LESS.CFG" file is required to run this program. Refer to ["ExpressBuilder for DOS-based with Remote Console" on page 244](#) for more information.*

■ Windows-based

This program is called "Master Control Menu" and runs 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 this menu.



ExpressBuilder for DOS-Based with Local Console

This subsection describes the procedures necessary to use 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 first the peripheral devices and then the server.

2. Insert the ExpressBuilder CD-ROM supplied with your server into the DVD-ROM drive of your server.
3. Ensure that the floppy disk drive is empty.
4. Press the RESET switch or press **Ctrl, Alt, and Delete** to reboot from the ExpressBuilder. (You may also turn off and then on again to reboot the server.) ExpressBuilder boots up displaying the top menu.



"Express Setup" is intended for the 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, insert the Windows CD-ROM, input a product ID number, and acknowledge the license agreement.

Caution

- The Express Setup does not support the installation of Windows server x64 Editions.
 - 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.
 - If applicable, once the Express setup has started, do not remove the "Configuration Diskette" from the floppy disk drive until you are asked to do so.
-

"Tools" is also intended for initial setup of the server. It allows additional installation options and allows 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 28: Tools Menu

Tools Menu	
Save/Restore RAID Configuration Data	RAID Board: None
Off-line Maintenance Utility	Server Management Board: None
System Diagnostics	
Create Support Disk	System Configuration: None
Setup Maintenance Partition	
BIOS/FW/etc. Update	
Initialize Remote Management Card	
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.
-

■ 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 BMC (Baseboard Management Controller) 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 ExpressBuilder. Doing so may cause a failure of the server.
 - When a keyboard is connected to the server, the remote console feature is disabled. (Nothing 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 this feature, you need to create a configuration file (3.5-inch floppy disk) that includes communication method between the server and the management PC, and various setup parameters. Use NEC DianaScope or run the "System Management" menu from the EXPRESSBUILDER to create a configuration file. Save the configuration file into the root directory of the floppy disk with the following file name.
 - File name: CSL_LESS.cfg

 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]
-

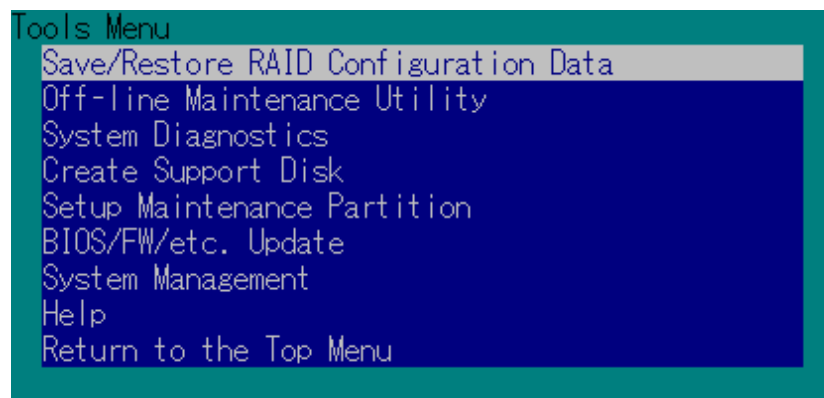
Top menu items are listed below:

- 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.
-

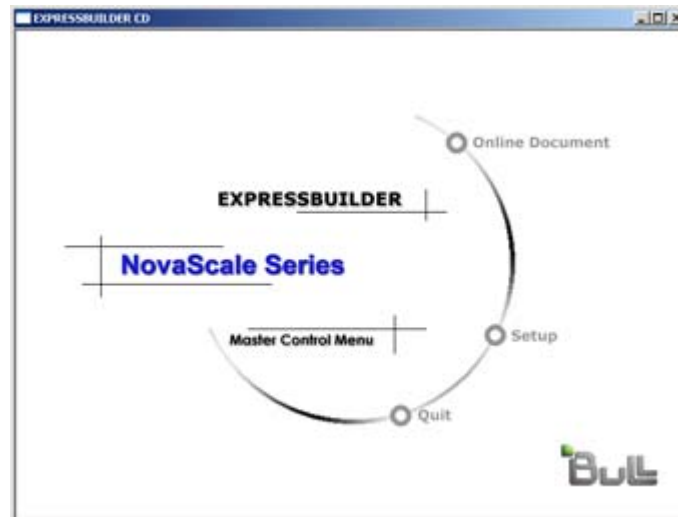
ExpressBuilder for Windows-Based (Master Control Menu)

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 system board temperature, memory failure, crashes, and software failure information.
- Performance
 - NEC ESMPRO monitors server performance and displays server usage on the screen and displays information, such as the rate of CPU load, memory usage, disk usage, and LAN traffic. Usage threshold values can help the system administrator monitor and prevent server overloads.

 **Note:** For the installation procedure and detailed explanations on NEC ESMPRO, refer to the online documentation provided on the ExpressBuilder CD-ROM.

Web-based Promise Array Manager

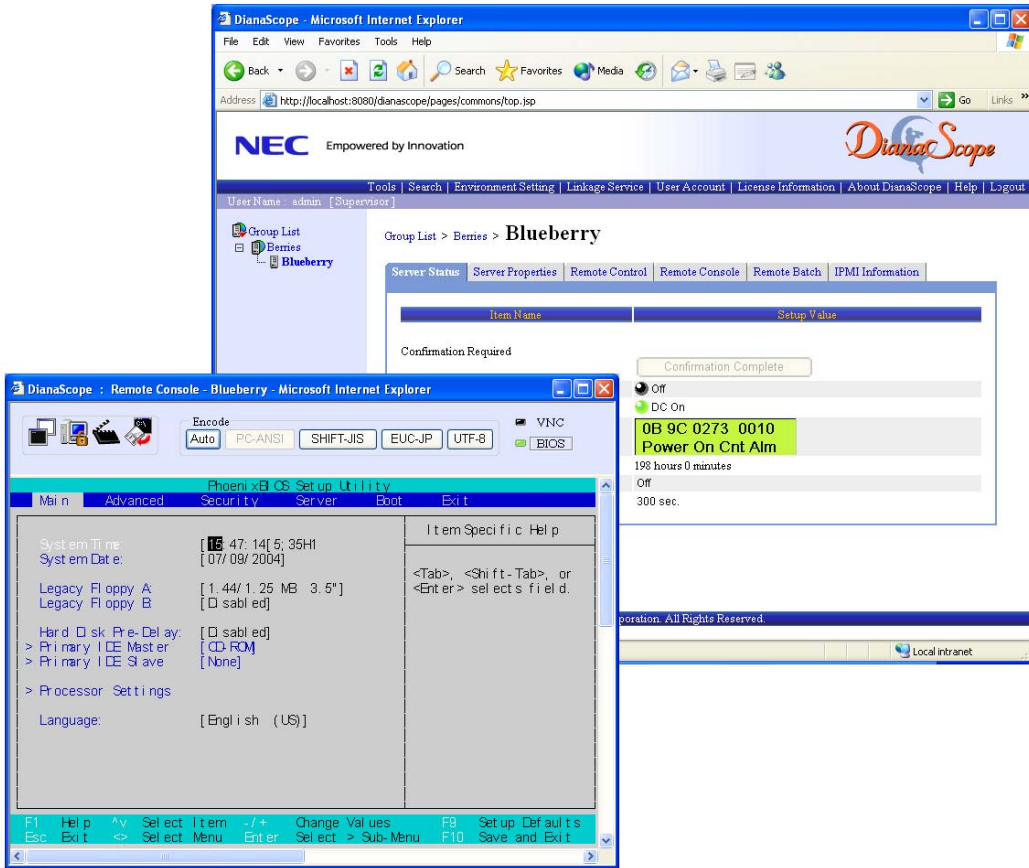
Web-based Promise Array Manager is a RAID management utility used for monitoring the SATA2 RAID controller.


Refer to the online documentation (pdf format) provided on the ExpressBuilder CD-ROM for more information.

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.

MegaRAID Storage Manager™ (Management PC)

Install the MegaRAID Storage Manager™ (hereinafter abbreviated to MSM) in a management PC that manages servers via the network.

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.

Appendix 7: 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 67.](#)

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 224](#) for more information.
 - If you install Windows Server 2003 without using Express Setup, see [“Appendix 4: Installing Microsoft Windows Server 2003” on page 204](#).
-


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")

 **Note:** Express Setup does not support the installation of Windows Server x64 Editions. If you want to install it, see [“Installing Microsoft Windows Server 2003 x64 Editions” on page 224](#).

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=

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:

$3500 \text{ MB} + (512 \text{ MB} * 1.5) + (512 \text{ MB} + 12 \text{ MB}) + \text{Application size} = 4792 \text{ MB} + \text{Application size}$

If the required partition size is larger than the size of a hard disk drive, we recommend you split the file across several disks.

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 [*“Installing Microsoft Windows Server 2003” on page 208*](#) 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 55 MB).

This area is used for saving some maintenance utilities.

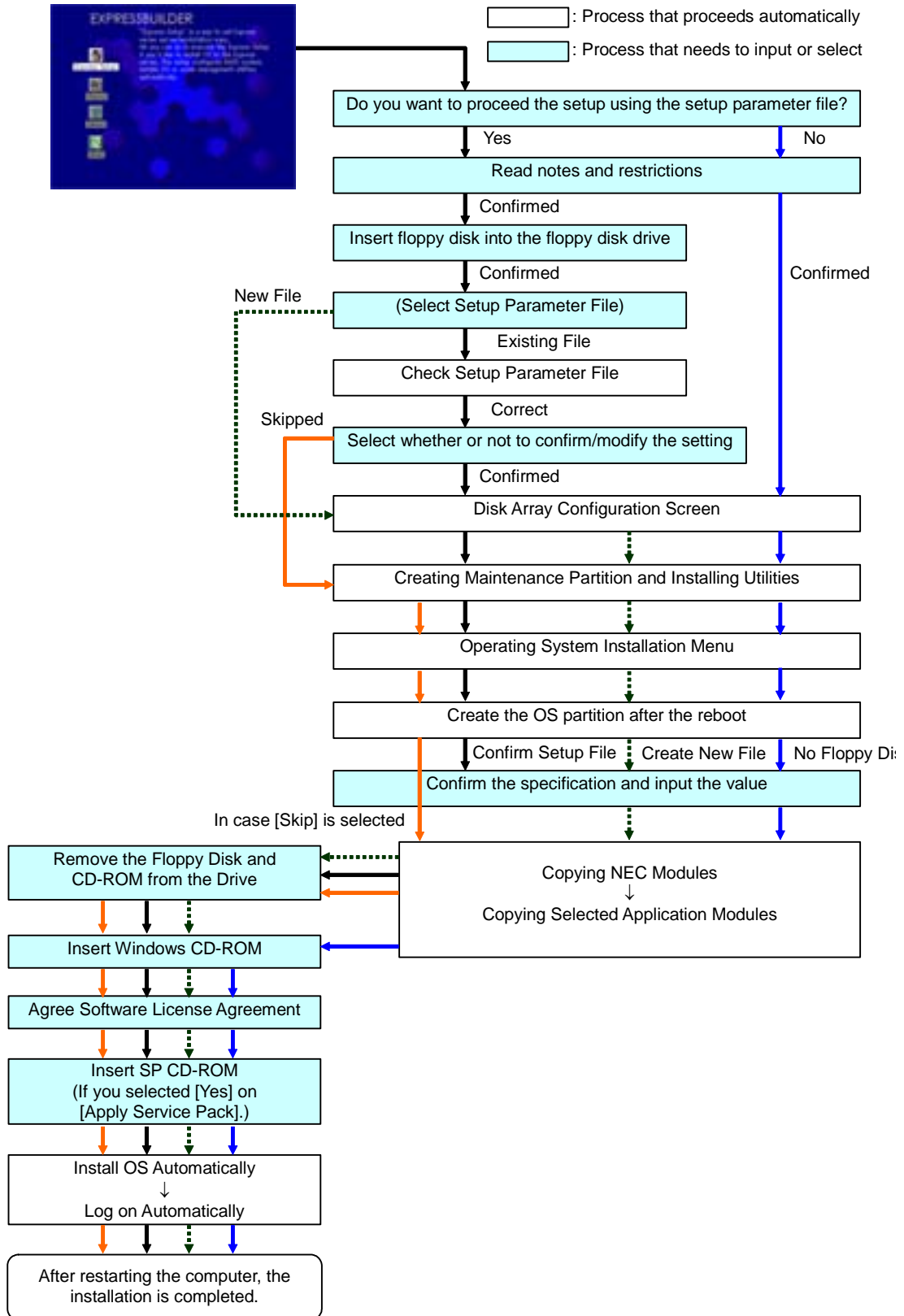
Do not delete the maintenance partition.

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
*2

The process is operated only when Disk Array Controller Board is connected and the configuration is specified.
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.*
-

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 Array" at "New/Existing RAID Configuration", the information included in the first partition (excluding maintenance partition) will all be formatted and deleted. The information included in the other partition will be retained. The figure below describes the partition which information will be deleted when maintenance partition exists.

First Partition <Maintenance Partition> Retained	Second Partition Deleted	Third Partition Retained	Fourth Partition Retained
--	--------------------------------	--------------------------------	---------------------------------

- You can not re-install the system with the existing partition that is upgraded to Dynamic Disk remained. Do not select "Use Existing Array" at "New/Existing RAID Configuration".
- If you specify other than 4095 MB for the "Installing Partition", it is necessary to convert to NTFS.
- If "Use Existing Array" at "New/Existing RAID Configuration" is selected but the partition other than the one to install Windows Server 2003 does not exist (excluding maintenance partition), Express Setup will reserve the maximum area of the hard disk to install Windows Server 2003.
- You 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 29: 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).*

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 270](#).
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 converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

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

This feature includes AFT feature.

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, Ultra SCSI 160, 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 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 re-start 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 FileFor 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 or 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 box appears.
5. Click to select the [Network Monitor Tools] check box, then click [OK].
6. The [Windows Components Wizard] dialog box appears again. Click [Next].
7. If the setup asks to install the disk, insert the OS CD-ROM into the CD-ROM drive and click [OK].
8. Click [Finish] in the [Windows Component Wizard] dialog box.
9. Close the [Add or Remove Programs] dialog box.
10. Close the [Control Panel] dialog box.

To start Network Monitor, point to [Program] → [Administrative Tools] and click [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 6: Installing and Using Utilities” on page 237](#).

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. Administrator) 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 8: Restrictions

This document describes the restrictions on the Bull NovaScale R440. Please read the below notices carefully and make sure to follow them.

Table 30: Bull NovaScale R440 Restrictions


List of Restrictions	
Wake ON LAN Feature	<p>Immediately after the AC power is turned on, the Remote Power ON/OFF feature (Wake ON LAN) is disabled. Start Windows 2003 once, provide settings as shown below, then shutdown the system. After restart, the Remote Power On/Off feature is available unless the AC power is turned off.</p> <p>Select [Start] → [Administrative Tools] → [Computer Management].</p> <p>Select Device Manager, double-click [Intel(R) PRO/1000 EB Network Connection with I/O Acceleration #n] under Network Adapter, and specify as follows in [Detail] tab.</p> <p>PME: [ON] Wake On:[Magic Packet]</p>
Standby Feature	<p>The standby feature of Windows Server is not available. Do not select "Standby" in the Windows shutdown menu.</p>
Memory Mirroring	<p>In memory mirroring configuration, the menus related to memory mirroring in BIOS SETUP are grayed out and unselectable in the following cases:</p> <ul style="list-style-type: none"> When you additionally install DIMMs that unable to configure memory mirroring When you remove DIMMs that takes down the memory mirroring <p>In this case, execute [Load Setup Defaults] to cancel the memory mirroring configuration.</p> <p><Procedure></p> <ol style="list-style-type: none"> (1) Note the BIOS SETUP settings. (2) Press the <F2> key during POST to run BIOS SETUP utility. (3) Select [Exit] → [Load Setup Defaults]. (4) When a message "Load default configuration now?" appears, select [Yes]. (5) Enter the parameter values you have saved in step (1). <p style="text-align: center;"> <i>Note: Executing [Load Setup Defaults] restores the default values for all Setup parameters. You need to specify those parameters again.</i></p>
When Installing Operating System without Using Express Setup	

Table 30: Bull NovaScale R440 Restrictions (Continued)




List of Restrictions	
	<p>To install the Windows operating system on the server, be sure to remove the external USB floppy disk drive when the message prompting you to restart the system appears upon completion of text-mode setup (Screen 1). Connect the external USB floppy disk drive after the OS has been installed.</p> <p>Once the external floppy disk drive has been removed, keyboard entry may be disabled when you attempt to reply to popup message during setup in GUI mode. In such a case, use a mouse instead (Screens 2 and 3).</p> <p>If the installation is conducted with an external floppy disk drive connected, the keyboard and mouse may not work properly during setup in GUI mode.</p> <p>[Screen 1]</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">Windows Server 2003 . Standard Edition Setup</p> <hr/> <p>This portion of Setup has completed successfully. If there is a floppy disk in drive A:, remove it. To restart your computer, press ENTER. When your computer restarts, Setup will continue.</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto; width: 80%;"> <p>Your computer will reboot in 5 seconds...</p> </div> </div> <p>[Screen 2]</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">Software Installation</p> <hr/> <p> has not passed Windows Log testing to verify its compatibility with this version of Windows</p> <p>Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the software vendor for software that has passed Windows Logo testing.</p> <p>Do you want to continue installing the software?</p> <p style="text-align: center;"> <input type="button" value="Yes"/> <input type="button" value="No"/> </p> </div> <p>[Screen 3]</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">Hardware Installation</p> <hr/> <p> The software you are installing for this hardware</p> <p>LSI Logic Embedded MegaRAID ...*</p> <p>has not passed Windows Logo testing to verify its compatibility with this version of Windows.</p> <p>Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor of software that has passed Windows Logo testing.</p> <p>Do you want to continue installing the software for this hardware?</p> <p style="text-align: center;"> <input type="button" value="Yes"/> <input type="button" value="No"/> </p> </div>
	When Using LSI Logic Embedded MegaRAID(tm) (SATA)

Table 30: Bull NovaScale R440 Restrictions (Continued)

List of Restrictions																						
<p>To use LSI Logic Embedded MegaRAID(tm), update the driver for LSI Logic Embedded MegaRAID(tm) stored in Software Update Kit CD-ROM, after you have installed an OS according to the User's Guide or Installation Supplement Guide.</p> <p>For detailed procedure, refer to "\\SWRAID\Driver\Readme_Eng.txt" stored in Software Update Kit CD-ROM.</p> <p><Outline of Installation Procedure></p> <p>(1) Start the system and logon to the system as a user having an administrative authority (e.g., administrator).</p> <p>(2) Insert the Software Update Kit CD-ROM into the DVD-ROM drive.</p> <p>(3) From the Windows Explorer or the like, double-click "\\SWRAID\Driver\Update.vbs" in Software Update Kit CD-ROM.</p> <p>(4) When the message "Do you update LSI Logic Embedded MegaRAID(tm) Driver?" appears, click [OK]. Updating the driver starts.</p> <p>(5) When updating completes, the message "Setup has successfully updated your system. Please restart your system." appears. Restart the system.</p>																						
Installing Additional SATA 2Hard Disk Drive																						
<p>When installing additional hard disk drive (SATA2), the slot number indicated in Chassis ID is not identical to that indicated in [Disk Management] of Windows 2003. When managing or replacing hard disk drives, be sure to verify the hard disk drive number on POST screen before starting work.</p>																						
<table border="1"> <thead> <tr> <th rowspan="2">Slot number indicated in chassis ID</th> <th colspan="3">Disk number in [Disk Management] of Windows</th> </tr> <tr> <th>1 HDD installed</th> <th>2 HDDs installed</th> <th>3 HDDs installed</th> </tr> </thead> <tbody> <tr> <td>ID0 (Fixed disk 0)</td> <td>Disk 0</td> <td>Disk 0</td> <td>Disk 0</td> </tr> <tr> <td>ID1 (Fixed disk 1)</td> <td>-</td> <td>Disk 1</td> <td>Disk 2</td> </tr> <tr> <td>ID2 (Fixed disk 2)</td> <td>-</td> <td>-</td> <td>Disk 1</td> </tr> </tbody> </table>				Slot number indicated in chassis ID	Disk number in [Disk Management] of Windows			1 HDD installed	2 HDDs installed	3 HDDs installed	ID0 (Fixed disk 0)	Disk 0	Disk 0	Disk 0	ID1 (Fixed disk 1)	-	Disk 1	Disk 2	ID2 (Fixed disk 2)	-	-	Disk 1
Slot number indicated in chassis ID	Disk number in [Disk Management] of Windows																					
	1 HDD installed	2 HDDs installed	3 HDDs installed																			
ID0 (Fixed disk 0)	Disk 0	Disk 0	Disk 0																			
ID1 (Fixed disk 1)	-	Disk 1	Disk 2																			
ID2 (Fixed disk 2)	-	-	Disk 1																			
<p>* To display POST screen, press the <Esc> key while the logo is displayed on screen after power-on. If the POST screen proceeds faster, use the <Pause> key to stop it.</p> <p>NOTE: Indication on POST screen is shown in parentheses.</p>																						

 *Note: If you have any questions about this document, please contact your sales representative.*

Appendix 9: Equipment Log

Use this equipment log form to record pertinent information about your system. You will need some of this information to run the System Setup Utility. Be sure to update the equipment log 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 system board. 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.

Hardware

Main Unit						
	Model name		Serial No.		Date installed	
CPU						
#1	Clock		Serial No.		Date installed	
#2	Clock		Serial No.		Date installed	
Memory						
#11, #12	Size		Serial No.		Date installed	
#9, #10	Size		Serial No.		Date installed	
#7, #8	Size		Serial No.		Date installed	
#5, #6	Size		Serial No.		Date installed	
#3, #4	Size		Serial No.		Date installed	
#1, #2	Size		Serial No.		Date installed	
Monitor						
	Type		Model name		Serial No.	
					Date installed	
Hard Disk						
ID0	Type		Serial No.			
	Capacity		Date installed			
	Type number					
ID1	Type		Serial No.			
	Capacity		Date installed			
	Type number					
ID2	Type		Serial No.			
	Capacity		Date installed			
Backup Device						
	Size		Capacity		Serial No.	
	Model name		Type number		Date installed	
PCI Slot #1B						
	Model name		Serial No.			
			Date installed			
PCI Slot #1C						
	Model name		Serial No.			
			Date installed			
Printer						
	Model name		Serial No.			

	Manufacturer		Date installed	
Additional cabinet for disk				
	Model name		Serial No.	
			Date installed	
External Peripheral Device 1				
	Model name		Serial No.	
	Manufacturer		Date installed	
External Peripheral Device 2				
	Model name		Serial No.	
	Manufacturer		Date installed	
External Peripheral Device 3				
	Model name		Serial No.	
	Manufacturer		Date installed	
External Peripheral Device 4				
	Model name		Serial No.	
	Manufacturer		Date installed	

Software

Firmware version				
OS	Apply	Name:		Version
Application of RUR media		Name:		Version
File system	FAT	HPFS	NTFS	
	Others ()			
Bundled software installed				
Licensed software installed				
Application running when a failure occurred				

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