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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 15](#)

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.

System Features

Your server is a modular, multiprocessing server based on the Intel® Pentium® 4 and Intel® Xeon® microprocessor families. It is a solid performer and offers the latest technology.

The combination of computing performance, memory capacity, and integrated I/O provides a high performance environment for many server market applications. These range from large corporations supporting remote offices to small companies looking to obtain basic connectivity capability such as file and print services, e-mail, web access, web site server, etc.

Your server is housed and available as a tower-based system, but you can also install it in a 19-inch rack unit using a separate rack-mount kit. Refer to [“Setting Up Your Server \(Rack\)” on page 55](#) for more information.

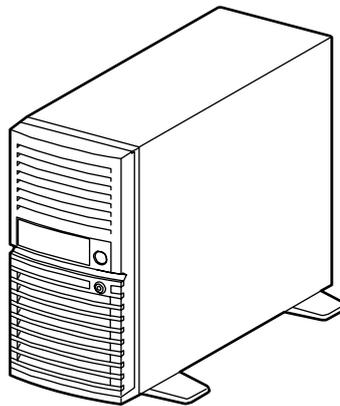


Figure 1: Front View

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

The server features the following major components:

- A high-performance Intel® Pentium® 4 or Intel® Xeon® processor.
- Up to 8GB of memory (using 2GB DIMMs). Minimum configuration is 512MB of memory.
- Dual channel memory configuration.
- Five integrated I/O expansion PCI/PCI-EXPRESS slots for add-in boards (1 PCI-EXPRESS 8x, 1 PCI-EXPRESS 4x, 3 PCI 32bit/33MHz)
- Onboard enhanced IDE interface controller.
- Onboard enhanced serial ATA RAID controller.
- Onboard 1000/100/10 network controller.
- Integrated optical disc drive.

- Four hard disk drive expansion bays.
- Two removable media expansion bay.
- Embedded PC-compatible support (serial, mouse, keyboard, USB, LAN, and video).
- High degree of SATA hard disk drive fault tolerance and advanced disk array management features through the use of RAID Technology.

To get comfortable with your computer, we recommend you read this user guide. Keep it in a safe place for future reference.

Related Documents

In the ExpressBuilder CD-ROM in which you found this User's Guide, you can also find several other documents relevant to your system, options and accessories.

Some printed documents may also have been shipped with your system.

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

System Chassis Features

Front View

The following figure shows the location of the front system features

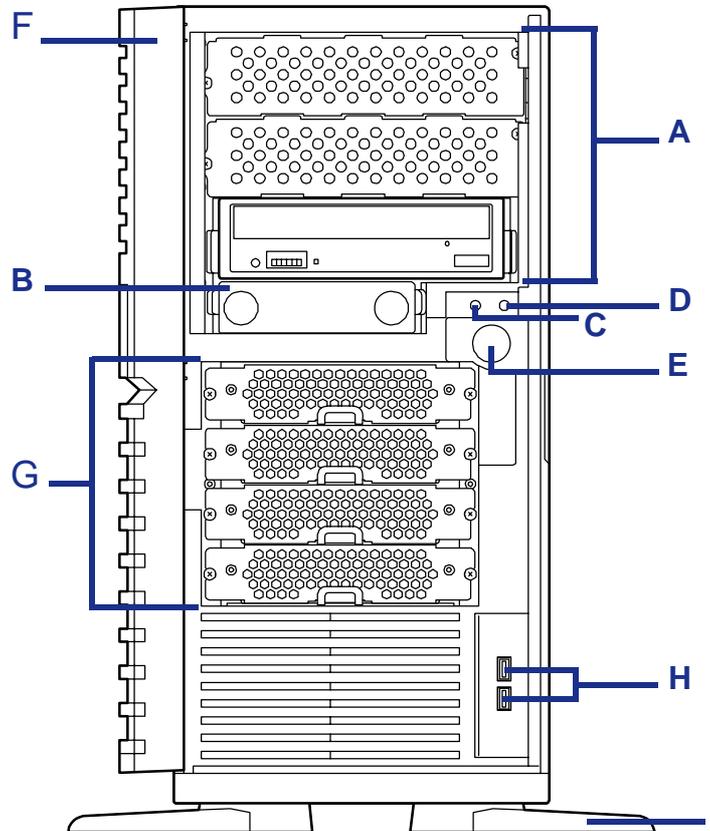


Figure 2: Front View

- | | |
|---|--|
| <p>A 5.25-inch bays Three 5.25-inch bays; the bottom bay may include a DVD-ROM drive or DVD Writer drive.</p> | <p>F Front door Open the front door to access the USB ports.</p> |
| <p>B 3.5-inch bay One 3.5-inch bay that may include a 3.5-inch floppy disk drive.</p> | <p>G Hard disk drive bays These bays contain one or several hard disk drives.</p> |
| <p>C Power/Sleep lamp Indicates whether the computer is on or off. A steady green lamp indicates the computer is on. The lamp blinks green when the computer is in stand-by mode.</p> | <p>H USB ports Two Universal Serial Bus (USB) ports allow you to connect USB-equipped peripheral devices such as printers.</p> |
| <p>D Disk Access lamp Lights up when a hard disk drive is active, reading or retrieving data. If the internal hard disk drive is connected to an optional board, this lamp lights only if the LED cable provided with the server is connected.</p> | <p>I Stabilizer Use the stabilizers to prevent the server from falling down. Close the stabilizers when laying the server down.</p> |
| <p>E Power button Press this switch to turn on/off the power. Refer to the 'Powering On your System', 'Powering Off your System' and 'Forcing a Power Shutdown' sections hereafter for details.</p> | |

Rear View

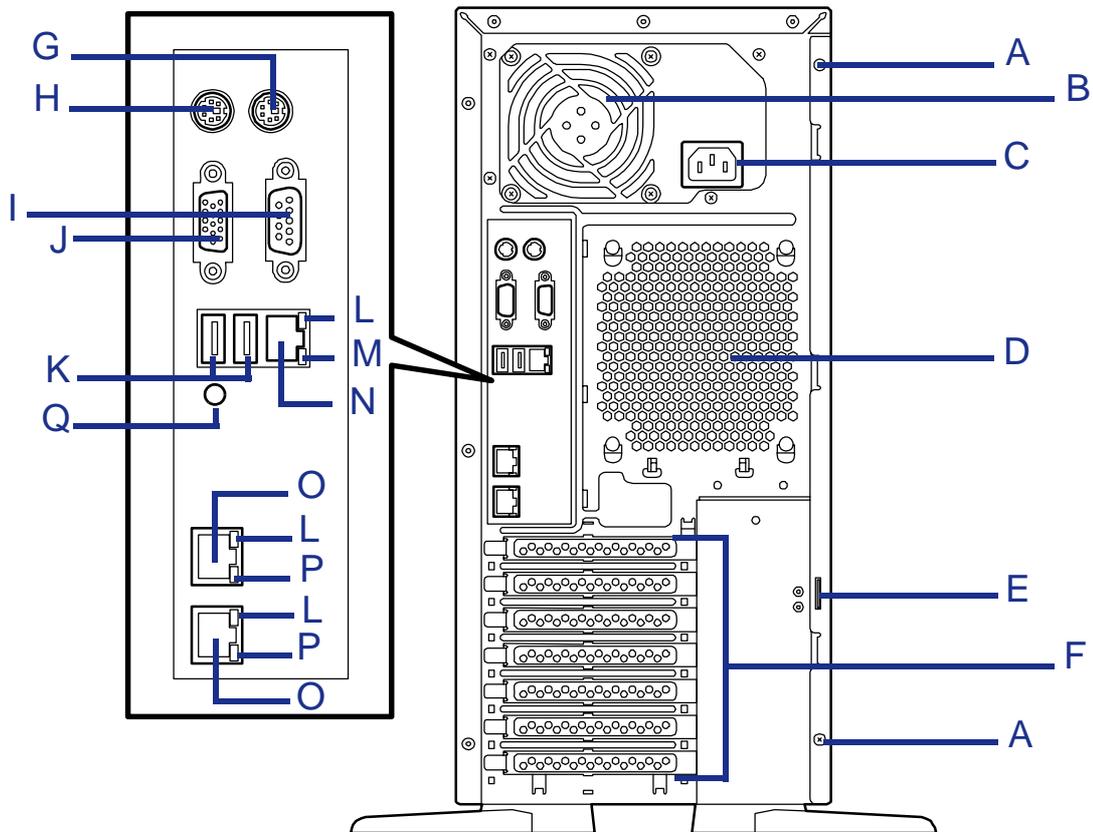
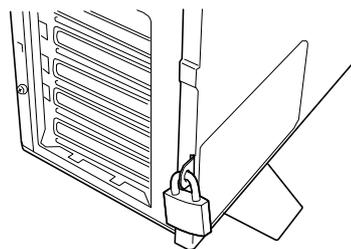


Figure 3: Rear View

- A Fixing screws**
These screws secure the left side cover.
- B Power supply ventilation holes**
Keep the area near the venting holes clear for proper ventilation.
- C AC power connector**
Connect the power cord to this socket.
- D Ventilation holes**
Keep the area near the venting holes clear for proper ventilation.
- E Cover lock plate**
Install a theft protection device to protect the system internal components.



- F Expansion boards slots**

Refer to [“Standard Features” on page 31](#)

G Mouse connector

Connect the mouse included with the system.

H Keyboard connector

Connect the keyboard included with the system.

I Serial Port connector

Connect any peripheral with a serial interface. The system cannot be connected directly to a leased line through this connector.

J Monitor connector

Connect the monitor included with the system

K USB connectors

Connect any peripherals with an USB interface.

L Link/ACT lamp

Shows the Local Area Network (LAN) access status.

M 100/10 lamp

Indicates the Management port transfer rate.

N Management LAN port

O LAN connector

Connect the system to a LAN allowing the following transfer speeds: 1000BASE-T/
100BASE-TX/10BASE-T.

P 1000/100/10 lamp

Indicates the LAN port transfer rate.

Q Dump button

Used by maintenance staff only. Do not press this button.

Status Indicators

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

Power Lamp

- Lights green to indicate normal operation with the server powered on.
- Remains off when the server is powered off.
- Blinks green when the server is in a power-saving mode.

Access Lamps

Lights green when one of the drives is being accessed.

Caution

To indicate the access states of the built-in hard disk drives when an optional board (e.g. disk mirroring controller or disk array controller) is installed, connect the LED cable provided with the server to the LED connector on the motherboard and the optional board.

LAN Connector Lamps

LINK/ACT Lamp

The link/ACT lamp indicates the state of each network port normally equipped with the server.

- Lights green when power is supplied to the server and the hub and they are correctly connected with each other (LINK state).
- Blinks green when information is transmitted through a network port (ACT state).

If the lamp does not light in LINK state, check the network cable and the cable connection. If the lamp still does not light, the network (LAN) controller may be defective. Contact your service representative.

1000/100/10 Lamp

The 1000/100/10 lamp indicates the network port mode, either 1000BASE-T, 100BASE-TX or 10BASE-T.

- Lights orange in 1000BASE-T mode.
- Lights green in 100BASE-TX mode.
- Turns off in 10BASE-T mode.

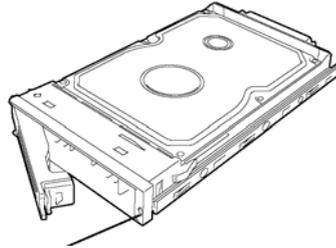
100/10 Lamp

The 100/10 lamp indicates the network port mode, either 100BASE-TX or 10BASE-T.

- Lights green in 100BASE-TX mode.
- Turns off in 10BASE-T mode.

Hard Disk Drive Lamp

The optional hot-swap hard disk drive bay can contain four SATA or SAS hard disk drives. Each hard disk drive has a DISK lamp on its front panel.



The DISK lamp indicates the drive status as follows.

- **Blinking green**
Indicates that the hard disk drive is being accessed.
- **Lighting amber**
Indicates that the installed hard disk drive is defective.

 **Note:** A single failed hard disk drive does not affect a server operating in RAID1 or RAID5 configuration. However, we strongly recommend you replace the failed hard disk drive and auto-rebuild (reconfigure) the hard disk drives as soon as possible. (You can hot-swap a failed hard disk drive.)

- Alternately blinking amber or green

Indicates that the hard disk drive is being rebuilt (this status is not a failure). When a defective hard disk drive is replaced with a new one in a disk array configuration, the data is automatically rebuilt (auto rebuild function).

The lamp goes off once the rebuild is finished. The lamp lights amber if the rebuild fails.

 **Caution**

To abort the rebuilding, power off the server. Observe the following notes to use the auto-rebuild feature.

- Do not power off the server. (If the server is powered off before rebuilding a hard disk drive, the auto-rebuild feature will not start.)
 - Wait at least 90 seconds between the removal and insertion of a hard disk drive.
 - Do not replace another hard disk drive while a rebuilding is already in progress.
-

Internal View

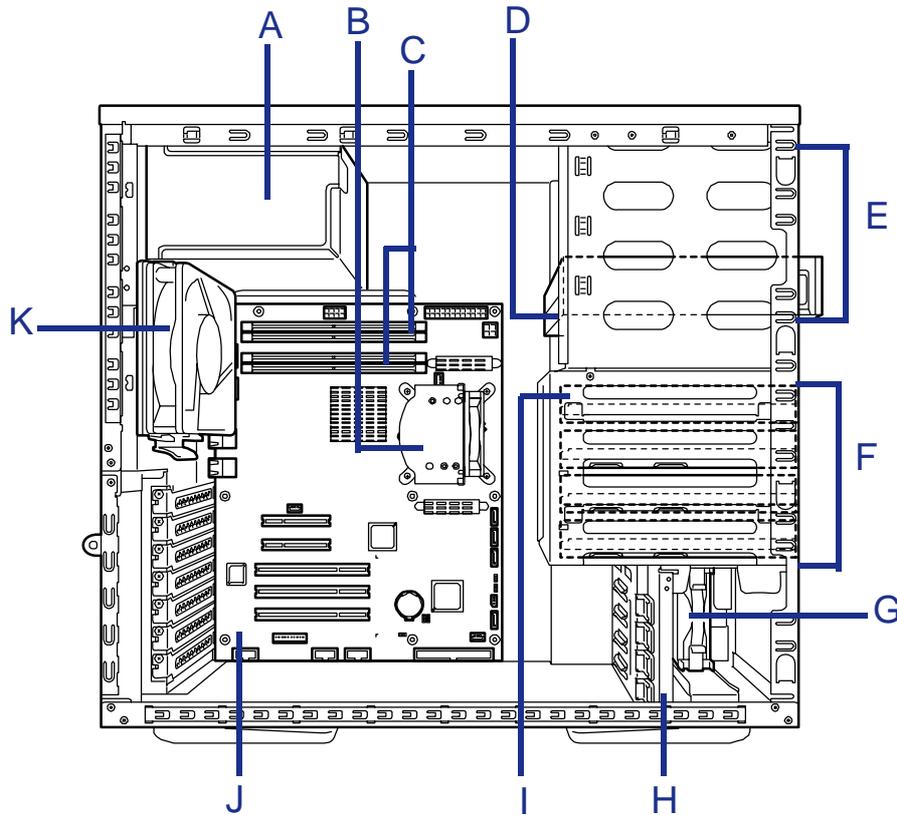


Figure 4: Internal View

- A Power supply slot
- B CPU heat sink
- C DIMMs
- D Optical disc drive
- E 5.25-inch devices slots
- F Hard disk drives slots
- G Front cooling fan
- H PCI guide rail
- I Hard disk drive (optional)
- J Motherboard
- K Rear cooling fan

Motherboard

Motherboard Layout

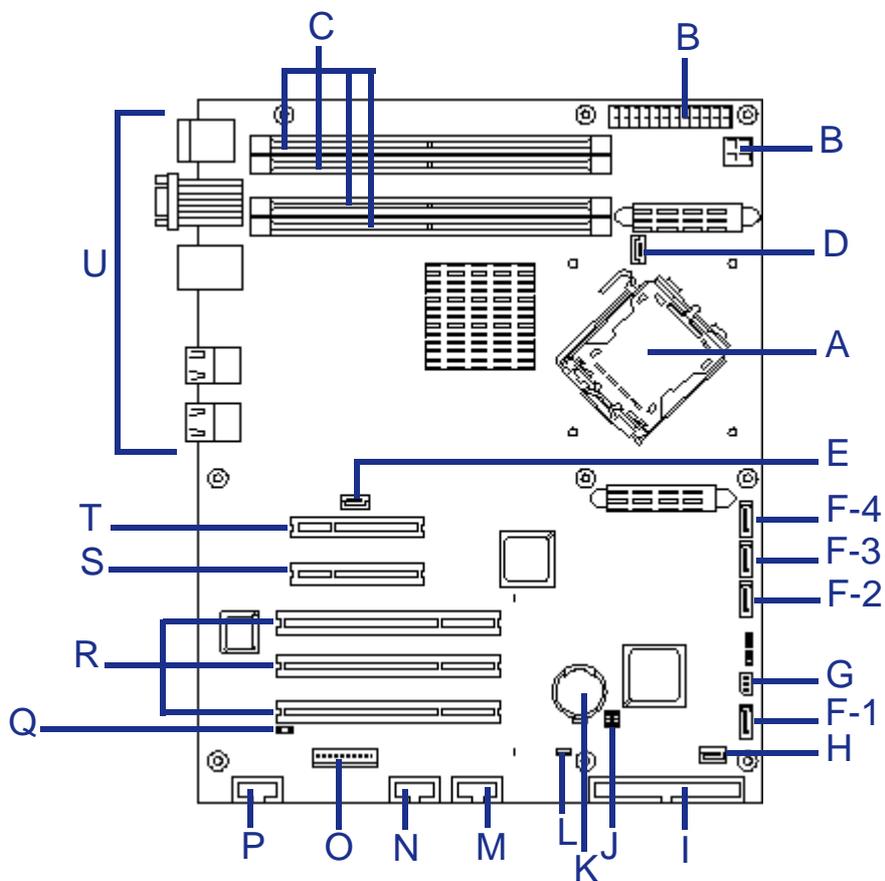


Figure 5: Motherboard Layout

Table 1: Server Board Connector and Component Locations

| | | |
|---------------------------------------|---|--|
| A. Processor socket | B. Power connectors | C. DIMM sockets (numbered 1 to 4 from bottom to top) |
| D. CPU heatsink fan | E. Rear fan | F. Serial ATA connectors (numbered 1 to 4) |
| G. JPMB connector | H. Front fan | I. IDE connector |
| J. Password clear jumper switch | K. Lithium battery | L. CMOS memory configuration jumper switch |
| M. Front USB connector | N. Internal USB device connector (optional) | O. Switch/LED cable connector |
| P. Serial port B connector (optional) | Q. RAID LED connector | R. 32bit/33MHz PCI-X slot |
| S. PCIe x4 (connector x8) slot | T. PCIe x8 slot | U. External connectors |

CMOS Jumper

Use the following procedure to clear the CMOS data in the server.

Caution

- Clearing the CMOS data resumes the factory-set configuration data.
 - Do not change any other switch settings. Any change may cause the server to fail or malfunction.
 - Clearing CMOS resets the [SATA RAID Enabled] option in the [Advanced] - [Peripheral Configuration] menu to [Disabled]. If SATA hard disk drives are installed in your server and if the onboard SATA RAID feature is used, change the [SATA RAID Enabled] parameter from [Disabled] to [Enabled] before exiting BIOS Setup. Leaving this parameter as the factory-set value (Disabled) may destroy the data in hard disk drive.
-

 **Note:** To display the [SATA RAID Enabled] menu, select [Advanced] - [Peripheral Configuration] - [SATA Controller Mode Option] - [Enhanced].

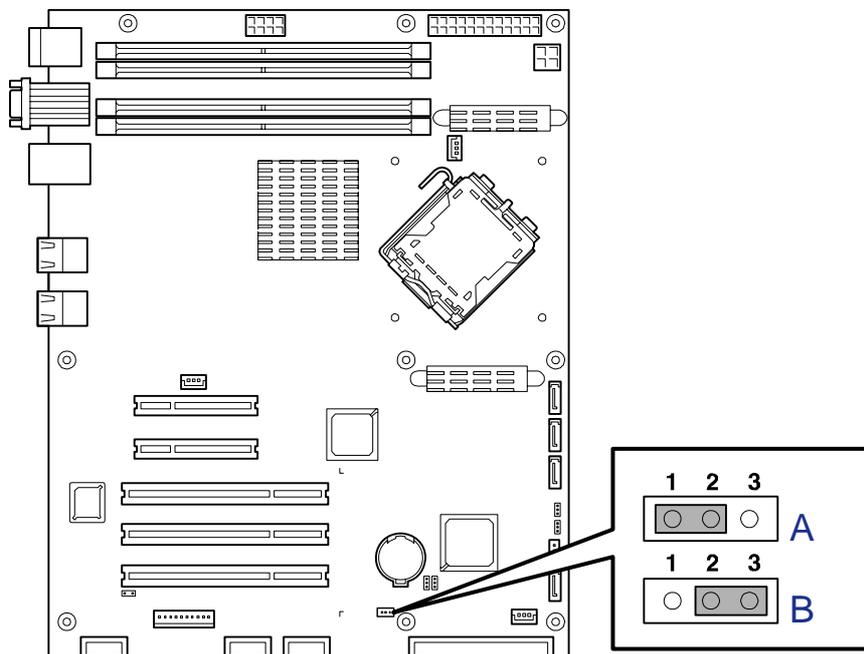


Figure 6: Motherboard Jumpers

A: Protect
B: Clear

Clearing the CMOS

1. Power down the system and disconnect the AC power.
2. Remove the left side cover. Refer to [“Removing the Left Side Door” on page 99](#).
3. Move the jumper from the normal operation position (pins 1 and 2) to pins 2 and 3 (Clear CMOS position).
4. Wait about three seconds, and replace the jumper on pins 1 and 2.
5. Close the server chassis.
6. Reconnect the AC power and power up the system.
7. Press **F2** during POST to run the BIOS Setup utility, and configure the mother board again.

Caution

If the SATA hard disk drives are installed in your server and the onboard SATA RAID feature is used, change the parameter of the [SATA RAID Enabled] in the [Advanced] - [Peripheral Configuration] menu from [Disabled] to [Enabled] before exiting BIOS Setup. Leaving this parameter as the factory-set value (Disabled) may destroy the data in hard disk drive.

Back Panel Connectors

Refer to [“Rear View” on page 20](#) for more information.

Memory Configuration

The server board provides four DIMM sockets across two channels, Channels A and B.

- Channel A consists of DIMM sockets 1 and 2.
- Channel B consists of DIMM sockets 3 and 4.

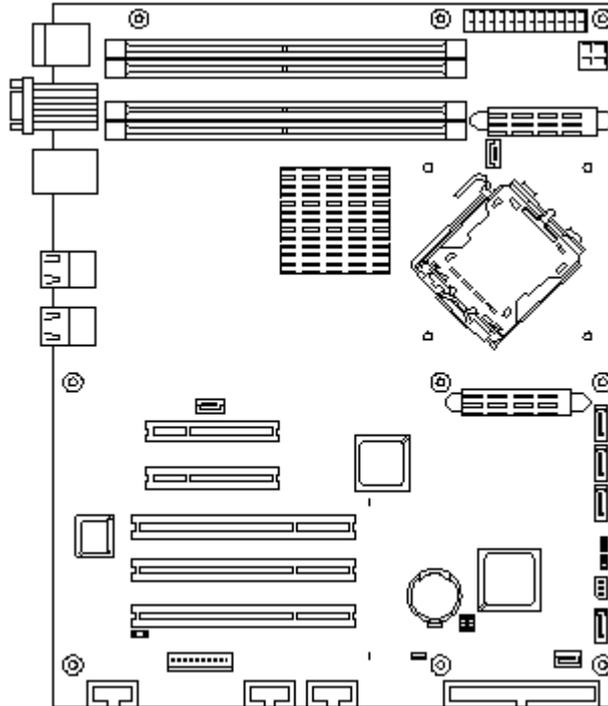


Figure 7: Memory Channels

Memory modules of the same capacity, when installed in even numbers, operate in the dual-channel mode, at a throughput speed of 8.6GB/S (4.3GB/S in the regular mode).

Refer to [“Recommended Memory Configuration” on page 125](#) for more information.

Maximum memory capacity supported by the OS and user memory capacity

Please see the table below for maximum memory capacities supported by some operating systems.

Some chipsets require a PCI resource area of approximately 750MB, meaning that the user memory capacity may be less than the installed memory capacity. The actual used PCI resource memory capacities varies depending on the kind and number of PCI cards installed.

Table 2: Maximum memory capacity supported by the OS and user memory capacity

| Physical Memory limits of the Operating System | | Installed memory and actually used memory (110Ek supports up to 8GB memory max.) |
|---|--------------|--|
| Windows Server 2003 Standard Edition (SP1 or later) | 4 GB | Installed memory: up to 3 GB Actually used memory: same as installed |
| Windows Server 2003 R2, Standard Edition | | Installed memory: 4 GB Actually used memory: approx 3.37 GB |
| Windows Server 2003 R2, Standard x64 Edition | 8 GB or more | Installed memory: up to 8 GB Actually used memory: same as installed |

Standard Features

Processor

The system board can accommodate either an Intel® Pentium® D, or an Intel® Xeon® processor.

Memory

The system board provides four DIMM slots each supporting DDR2 667 ECC memory. You may install a minimum of 512MB and as much as 8GB (4 x 2GB).

Your system supports dual-channel memory architecture. Refer to [“Memory Configuration” on page 29](#) for details.

Expansion Slots

- Three full length 32-bit/33MHz PCI connectors.
- One PCIe x8 connector.
- One PCIe x8 connector (operating at 4x).

Video

The motherboard features an on-board video controller with 2MB external video memory.

Network Controller

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

The motherboard features:

- A dual port controller for 10/100/1000 Mbit/s Ethernet LAN connectivity.
- A 10/100 controller dedicated for management.

Power Management

The power-saving mode is only available when the OS supports the power-saving feature. Some operating systems allow you to set the server to automatically turn in the power-saving mode when no access is made to the server for a certain period of time or to select the power-saving mode with a command.

Keyboard and Mouse

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

RAID Support

The motherboard features an onboard LSI controller providing RAID support for SATA configurations.

- RAID0, RAID1 and RAID5 (with additional cage) support.
- Microsoft Windows and Linux support.
- Set-up with the [“RAID Configuration using the LSI Logic Software RAID Configuration Utility” on page 83](#).

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 in order to turn it on.

To enable this feature, you must enable each submenu in the Power Management Setup of the Advanced menu of the BIOS setup utility, "SETUP." Refer to [“Advanced Menu” on page 282](#) for more information.

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

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

In these cases, press the POWER/SLEEP switch once to start the OS, and power off the server in an appropriate procedure.

AC LINK Feature

When the power cord of the server is connected to an uninterruptible power supply (UPS) unit, the server supports the power linkage feature that enables control over the power supply from the UPS to the server. The AC LINK feature can be enabled or disabled with Power Management Setup in the Server menu of the BIOS setup utility. Refer to [“Server Menu” on page 291](#) for more information.

Power Supply

The system contains one auto-sensing 380W power supply at an operating frequency of 50/60 Hz.

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

Peripheral Bays

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

- One 3.5-inch file bay to install a 3.5-inch floppy disk drive (supports 720KB and 1.44MB floppy disk media).
- Three 5.25-inch file bays to install half-height 5.25-inch peripheral devices such as optional tape drives (An optical drive is factory-installed).
- The hard disk drive bays to install up to four S-ATA hard disk drives or an additional hard disk cage in which SAS/SATA hot-swap hard drives can be installed.

Optional Features

You will find hereafter information about the optional components that may be installed in your system.

This is not an exhaustive list, some options may not be available any more, others may have been added.

LTO 2 Tape Drive (SCSI)

Please refer to the documentation on the *Tape Online CD* for more information.

Sony AIT-2 Turbo Tape Drive (SCSI)

Please refer to the documentation on the *Tape Online CD* for more information.

Sony AIT-1 Turbo Tape Drive (IDE)

Please refer to the documentation on the *Tape Online CD* for more information.

DAT72 Tape Drive (USB)

Please refer to the documentation on the *Tape Online CD* for more information.

Intel Pro/1000 PT Single Port LAN Board

One gigabit copper server connection in a PCI Express slot.



Interface

- PCI Express.

Connectors

- One RJ-45.

IEEE standards / network topology:

- 10BASE-T, 100BASE-TX, 1000BASE-T.

Features

- High-performance, self-configuring 10/100/1000 Mbps connection for PCI Express slots
- Multi-Gigabit scalability and increased uptime through advanced server features
- Load balancing on multiple CPUs: Increases performance on multi-processor systems by efficiently balancing network loads across CPU cores.
- Interrupt moderation: Delivers increased performance while significantly reducing CPU utilization.
- Compatible with x1, x4, x8, and x16 full-height and low-profile PCI Express slots.
- Remote management support.
- Intel® PROSet Utility for Microsoft Device Manager: Provides point-and-click power over individual adapters, advanced adapter features, connection teaming, and VLAN configuration.
- Advanced cable diagnostics: Dynamically tests and reports network problems (error rate, cable length) and automatically compensates for cable issues (cross-over cable, wrong pin-out/polarity).

Intel Pro/1000 PT Dual Port LAN Board

Two gigabit copper server connections in a single PCI Express slot.



Interface

- PCI Express.

Connectors

- Two RJ-45.

IEEE standards / network topology:

- 10BASE-T, 100BASE-TX, 1000BASE-T.

Features

- Intel® PROSet Utility and Intel® PRO Intelligent Install for easy installation.
- Intel® lead-free¹ technology.
- Plug and play specification support Standard.
- Auto-negotiation, full-duplex capable.
- Integrated media access control (MAC) and physical layer (PHY).
- Includes a full-height bracket.
- Cable distance: 100m in Category-5 for 100/1000 Mbps and Category-3 for 10 Mbps.

Network Management

- Wired for Management (WfM) baseline v2.0 enabled for servers.
- DMI 2.0 support, Windows Management Instrumentation (WMI) and SNMP-manageable SMBus support.
- Remote Installation Services (RIS).
- Diagnostics (loopback, testability, PHY register access).
- Advanced Configuration and Power Interface (ACPI) 1.0 power management.
- Wake on LAN support over PCI Express.
- PXE 2.0 enabled through boot read-only memory (ROM).

Advanced Software Features

- Adapter Fault Tolerance (AFT).
- Switch Fault Tolerance (SFT).
- Adaptive Load Balancing (ALB).

- Fast EtherChannel (FEC).
- Gigabit EtherChannel (GEC).
- Teaming support : Scales up to 8 connections.
- Multiple teams: Supports 4 separate teams, maximum.
- IEEE 802.3ad (link aggregation control protocol).
- PCIe Hot Plug/Active peripheral component interconnect (PCI).
- IEEE 802.1Q VLANs.
- IEEE 802.3 (z, ab, u, x) flow control support.
- TCP checksum offload — transmission control protocol (TCP), user datagram protocol (UDP), Internet protocol (IP).
- IEEE 802.1p.
- TCP segmentation/large send offload.
- Interrupt moderation.

Intel Pro/1000 MT Single Port LAN Board

PCI-X Gigabit Adapter for Copper Networks.



Interface

- PCI-X.

Connector

- One RJ-45.

IEEE standards / network topology:

- 10BASE-T, 100BASE-TX, 1000BASE-T.

Features

- Intel® Single Driver™ technology.
- Backward Compatibility with previous generations of Intel PRO/1000 Network Adapters.
- Supports 64- or 32-bit PCI-X 1.0 or PCI 2.2 buses.
- Remote Management Support (WfM, RIS, SNMP/DMI).
- IEEE 802.3ab Compatibility.
- Interrupt Moderation: delivers increased performance while significantly reducing CPU utilization.
- Includes a low profile and a full-height bracket.

Network Management

- Compatible with Fast Ethernet.
- Gigabit speeds on Category-5 cable networks.
- Auto-sensing, self-configuring 10/100/1000 Mbps.
- Advanced Cable Diagnostics: dynamically tests and reports network problems (error rate, cable length) and automatically compensates for cable issues (cross over cable, wrong pin-out/polarity).
- Large Send Off-load/TCP Segmentation Off-load: Compatible with Large Send Off-load feature of Microsoft Windows Server 2003, 2000 and XP which enables wire speed performance with low CPU utilization.
- Expanded Advanced Server Features: Intel® ANS software increases uptime with redundant, teamed connections and scales bandwidth by balancing network traffic across multiple server connections. Now offers Switch Fault Tolerance and Test Switch Configuration to test compatibility and further increase uptime.

ATI RN50 (ES1000) Video Board

Interface

- PCI

Connector

- VGA

Specifications

- Memory speed: 250 MHz
- Memory size: 16 MB
- Memory interface: 16 bit

Key Features and Benefits

- 2D Graphics Accelerator
- Maximum display modes supported
 - 1600x1200 @ 75Hz, 8-bit colour
 - 1280x1024 @ 120Hz, 16-bit colour
 - 1152x864 @ 80Hz, 24-bit colour

Adaptec 29160ALP SCSI Controller

The Adaptec SCSI Card 29160 delivers the maximum throughput for a single channel Ultra160 SCSI card by using a 64-bit PCI interface.

The Adaptec SCSI Card 29160 provides the ideal connection to external Ultra160 SCSI (LVD) devices.

Highlights

- 160 MByte/sec performance
- SpeedFlex technology ensures top performance of all connected devices, regardless of SCSI generation
- Seamless backwards compatibility protects legacy devices
- Industry-leading compatibility, reliability*
- CRC (Cyclical Redundancy Checking) improves data integrity
- Domain Validation intelligently verifies system configuration for improved reliability

Specifications

- 1-channel, 64-bit (32-bit compatible), ideal for internal and external hard disk drive configurations
- Data Transfer Rate: 160MB/sec
- External Connectors
 - One 68-pin for LVD SCSI devices
- Internal Connectors
 - One 68-pin for LVD SCSI
 - One 68-pin for Ultra Wide SCSI
 - One 50-pin for Ultra SCSI Bus Type 64-bit PCI (32-bit compatible)
- Board Dimensions 6.87" x 3.87"

Adaptec 29320ALP SCSI Controller

The Adaptec SCSI Card 29320 provides the ideal connection to external Ultra320 SCSI (LVD) devices.

Highlights

- Adaptec Seamless Streaming® ; this technology pushes the performance of Ultra320 SCSI to its theoretical limit by implementing in hardware three new design advances:
 - Ultra Streaming Data Path
 - Matrix Command Management
 - Rapid Packet Protocol Engine
- 320 MByte/sec performance per channel
- Industry-leading compatibility and reliability

Specifications

- Hardware Features
 - 64-bit/ 133 MHz PCI/PCI-X interface
 - Compatible with 32-bit PCI slots (thus running in the slower 32-bit mode)
 - Single-channel Ultra320 SCSI card.
- Connectors
 - 68-pin internal connector
 - 68-pin VHDCI external connector for Ultra320 SCSI (LVD) hard disks drives
- Physical Specifications
 - Size: 16,8cm x 6,4cm

Promise SuperTrak EX8350 RAID Controller (SATA)

 **Notes:** For more information, refer to the documentation included on the ExpressBuilder CD.

Features

- 8-Port Serial ATA (SATA) RAID controller with 3.0 Gb/s per port.

The SuperTrak EX8350 RAID controller provides support for SATA 3Gb/s drives and meets the needs of disk-to-disk backup, NAS storage, security and surveillance, video editing, and near-line storage.
- PCI-Express x 4 Host Bus Interface, allowing for up to 1GB throughput per second.
- Support RAID levels 0, 1, 5, 6, 10, 50 and JBOD (depending on your server configuration).
- Online capacity expansion and RAID level migration to add capacity as needed.
- Hardware-accelerated RAID 6 Capable for maximum reliability.

The SuperTrak EX8350 delivers multi-drive performance by taking advantage of Intel's XScale 80333 I/O processor technology. It offers advanced RAID 6 technology for high level fault tolerance, allowing multiple simultaneous drive failures without downtime or data loss.
- Multiple logical drive support.
- Automatic/manual rebuild of hot spare drive.
- PerfectRAID technology for robust error handling and recovery.
- Battery backup module optional.
- Easy to manage through the Web-based Promise Array Manager (WebPAM) software, a browser-based graphical user interface.

Specifications

- Hardware Specifications.
 - Eight SATA ports at 3.0Gb/s (300MB/sec).
 - Storage capacity up to 16.0 terabytes (with eight 500GB drives x 4 controllers/system).
 - PCI-Express x 4 host bus interface.
 - Intel IOP333 XScale I/O processor (500 MHz).
 - 128MB DDR ECC on-board controller cache.
 - Battery back-up module option.

- Four controller support within a system.
- Low profile form factor ideal for 1U/2U server.
- Combine with the SuperSwap 4100 for an advanced internal storage system.

- RAID Levels Supported.
 - RAID 0,1,5,6,10, 50 and JBOD.

- RAID Fault Tolerance and Robustness Features.
 - Multiple logical drive support enables combining different RAID levels on one set of disks.
 - Read Check table to avoid data read errors.
 - Online capacity expansion and RAID level migration to add capacity as needed.
 - PerfectRAID technology for error handling and recovery of fatal, media and disk errors.
 - Support hot swap of failed drives and hot spares.
 - Automatic/manual rebuild of hot spare drive.
 - Background initialization for instant drive availability.
 - Supports bad sector remapping.
 - Variable stripe block size support to meet various application requirements.
 - Synchronization can be scheduled periodically for RAID array data consistency.

- Advanced Performance Features.
 - Multiple caching policy support.
 - Packet commands and interrupt coalescing minimize interrupts for better performance.
 - Elevator seek streamlines commands based upon data location on the disk.

- Web-based Promise Array Manager.
 - Creates, deletes, expands, and converts disk arrays remotely.
 - Array synchronization and rebuild scheduling.
 - Monitors drive, array, and enclosure status and provides online event logging.
 - E-mail notification of drive, array, controller or enclosure events (e.g. error or degrade conditions).

- SuperBuild BIOS.
 - Array configuration utility at the BIOS level.
 - BIOS Boot Specification support: boot system from any array.

Promise SuperTrak EX4350 RAID Controller (SATA)

 **Notes:** For more information, refer to the documentation included on the ExpressBuilder CD.

Features

- 4-Ports Serial ATA (SATA) RAID controller.
The SuperTrak EX4350 RAID controller provides support for SATA drives and meets the needs of disk-to-disk backup, NAS storage, security and surveillance, video editing, and near-line storage.
- PCI-Express x 4 Host Bus Interface, allowing for up to 1GB throughput per second.
- Support RAID levels 0, 1, 5, and 10.
- Additional battery support to operate in write-back mode.
- Automatic detection of faulty drives.
- Easy to manage through the Web-based Promise Array Manager (WebPAM) software, a browser-based graphical user interface.

Specifications

- Hardware Specifications:
 - Eight SATA ports at 3.0Gb/s (300MB/sec).
 - PCI-Express x 4 host bus interface.
 - 64MB SDRAM on-board controller cache.
- RAID Levels Supported: RAID 0,1,5 and 10.
- Web-based Promise Array Manager:
 - Creates, deletes, expands, and converts disk arrays remotely.
 - Array synchronization and rebuild scheduling.
 - Monitors drive, array, and enclosure status and provides online event logging.
 - E-mail notification of drive, array, controller or enclosure events (e.g. error or degrade conditions).
- BIOS:
 - Array configuration utility at the BIOS level.
 - BIOS Boot Specification support: boot system from any array.

Promise Ex4650 RAID Controller (SAS)

 **Notes:** For more information, refer to the documentation included on the ExpressBuilder CD.

Features

- 4-Ports Serial Attached SATA (SAS) RAID controller.
- RAID level 5 support (depending on your system configuration).
- PCI-e x 4 Host Bus Interface.
- Onboard 128MB ECC DDRII memory.
- Half height/low profile.
- Intel 667MHz XScale integrated I/O processor (Sunrise Lake).
- Hardware XOR engine to offload parity calculation.
- Staggered drive spin-up to avoid excessive power draw at power up (only available for the drives attached directly to Sunrise Lake).
- Optional battery backup unit to keep data retention up to 72 hours.
- Easy to manage through the Web-based Promise Array Manager (WebPAM) software, a browser-based graphical user interface.

Compliance

- ACPI support.
- Conforms to SAS1.1 specification.
- Supports SAS specification of 3Gb/s transfers with CRC error-checking.
- Supports hot-plug SAS drives.
- Native PCIe host interface.

LSI 8408E RAID Controller (SAS)

 **Notes:** For more information, refer to the documentation included on the ExpressBuilder DVD-ROM.

Features

- Eight internal SAS/SATA ports: two x4 SFF 8484 connectors.
- 3 Gb/s throughput per port.
- Greater than 2TB array support.
- Advanced data integrity and recovery.
- Enhanced error handling and reporting.
- FlexRAID[®]:
 - Online Capacity Expansion (OCE).
 - Online RAID Level Migration (RLM).
- Comprehensive management and configuration utilities.

Specifications

- Hardware Specifications.
 - Intel[®] IOP333 I/O Processor.
 - PCI Express 1.0a compliant.
 - 2.5 Gb/s per lane.
 - x8 lane width.
 - 256MB DDRII 400MHz SDRAM.
 - Optional intelligent transportable battery backed DIMM module.
 - Full SAS expander support (32 disk support).
- RAID Levels Supported.
 - RAID Levels 0, 1, 5, 10, and 50.
- Configuration software: MegaRAID Management Suite. Refer to [“RAID Configuration using the MegaRAID Configuration Utility” on page 95](#).
 - Online.
 - MegaRAID Storage Manager.
 - MegaCLI (Command-line Interface).
 - Pre-Boot.
 - MegaRAID BIOS Configuration Utility.

Setting Up Your System

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

Unpacking the System

When you receive your system, inspect the shipping containers prior to unpacking. If the shipping boxes are damaged, note the damage, and if possible, photograph it for reference.

Remove the contents of the containers, and 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.

The carton contains various accessories, as well as the server itself. If you find any component missing or damaged, contact your service representative.

Store the provided accessories in a designated place for your convenience. You will need them to install an optional device or troubleshoot your server, as well as to set it up.

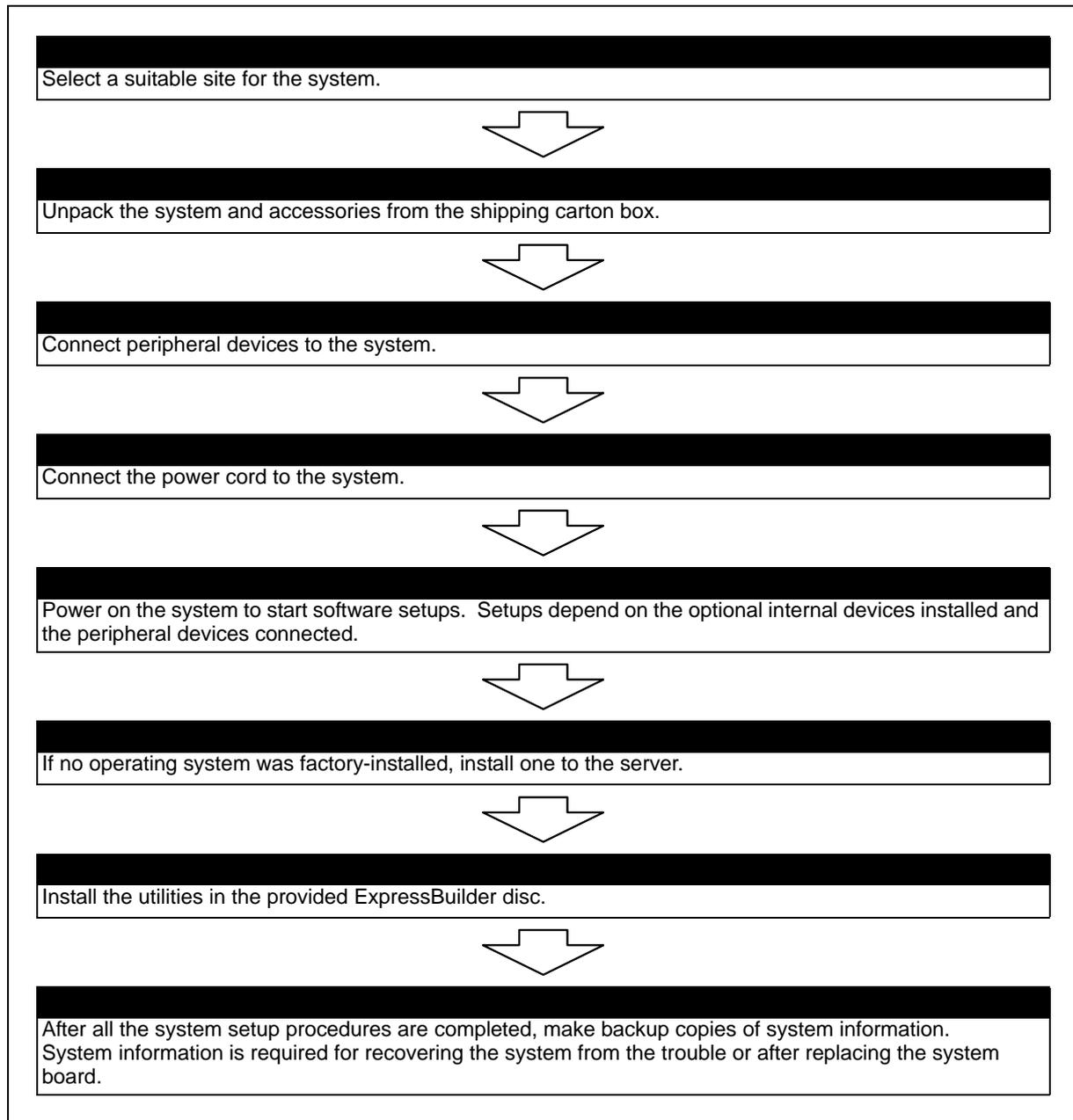
Make a backup copy of each provided discs, if any. Store the original disc as the master disc in a designated place, and use its copy.

Improper use of any provided disc may alter your system environment. If you find anything unclear, immediately ask your service representative for help.

Setting Up Your System (Tower)

This chapter describes how to select a site, unpack the system, make cable connections, and power on the system units.

Setup Flow.



Selecting System Site

Warning

Observe the following instructions to use the system safely. Failure to follow these instructions may result in death or serious personal injury. See [“General Safety Information” on page 96](#) for details.

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

Caution

Failure to follow the instructions listed below may cause a fire, personal injury, or property damage. See [“General Safety Information” on page 96](#) for details.

- Do not install the system where the load may be concentrated on a specific point.
 - Do not provide the wiring exceeding the rating power.
-

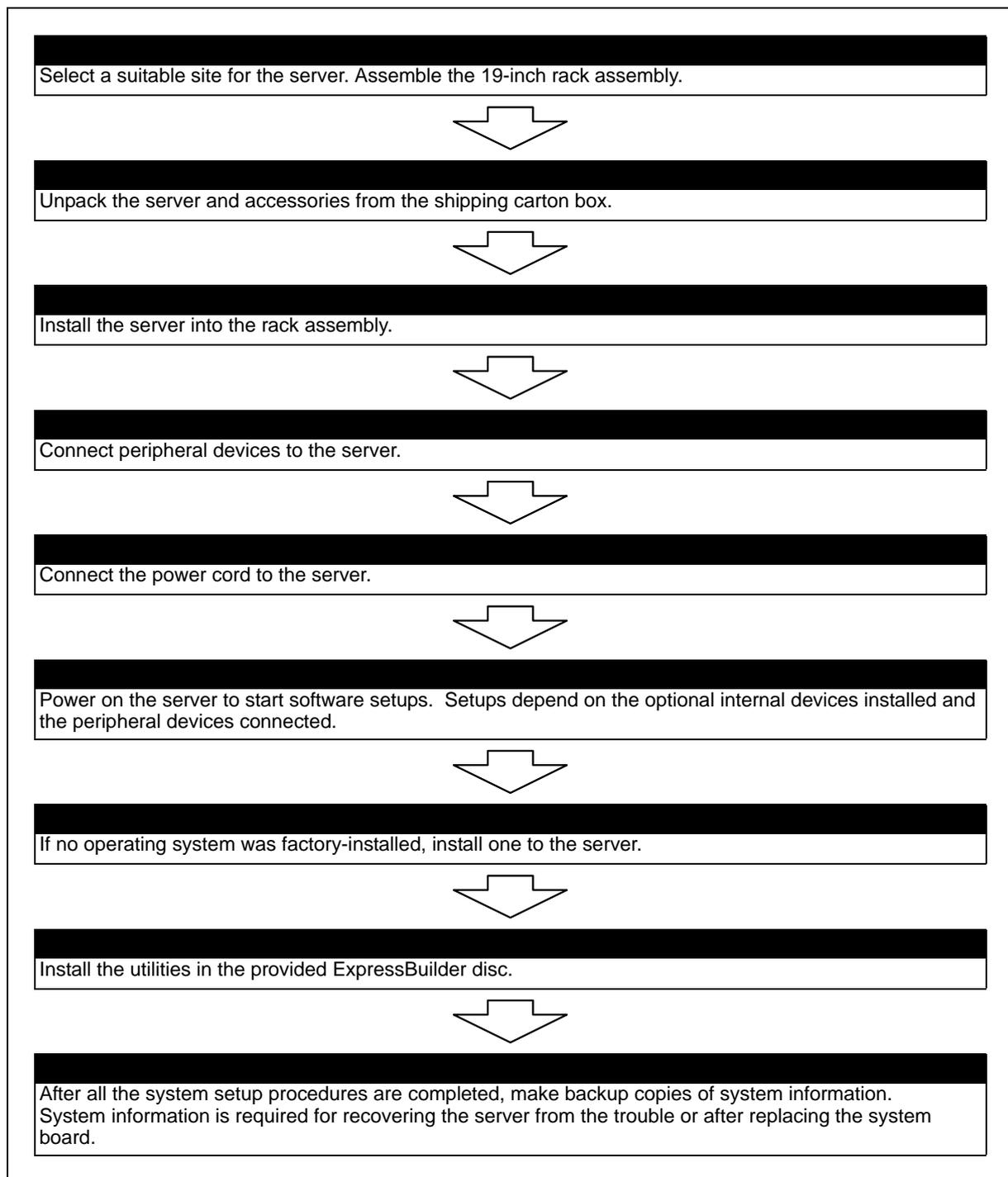
Do not install the system in the places listed below, doing so may cause malfunctions to occur.

- Place of uneven or slanting floor
- Place of drastic temperature change (near a heater, air conditioner, or refrigerator)
- Place where intense vibration may be generated
- Place where corrosive gas is generated, chemicals are nearby, or chemicals may be accidentally sprayed over
- Place where a carpet not subject to anti-static process is laid.
- Place near a device generating intense magnetic field (such as a TV, radio, broadcast/communication antenna, power transmission wire, and electromagnetic crane) is placed (If unavoidable, contact your sales agent to request proper shield construction.)
- Place where the power cord of the system must be connected to an AC outlet that shares the outlet of another device with large power consumption.
- Place near equipment that generates power noise (e.g., contact spark at power-on/power-off of commercial power supply through a relay). If you must install the system close to such equipment, request your sales agent for separate power cabling or noise filter installation.

Setting Up Your Server (Rack)

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

Setup Flow.



Selecting Server Site

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

Refer to the documentation attached to the rack or contact your sales agent for the installation of the server on the rack.

Warning

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See [“General Safety Information” on page 96](#) for details.

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

Caution

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See [“General Safety Information” on page 96](#) for details.

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

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

- Narrow space from which devices cannot be pulled out from the rack completely
- Place that cannot bear the total weights of the rack and devices mounted on the rack
- Place where stabilizers cannot be installed or where the rack can be installed only after the practice of proper earthquake-resistant construction
- Place of uneven or slanting floor
- Place of drastic temperature change (near a heater, air conditioner, or refrigerator)
- Place where intense vibration may be generated

- Place where corrosive gas is generated, chemicals are nearby, or chemicals may be accidentally sprayed over
- Place where a carpet not subject to anti-static process is laid.
- Place where some objects may be fallen on the rack
- Place near a device generating intense magnetic field (such as a TV, radio, broadcast/communication antenna, power transmission wire, and electromagnetic crane) is placed (If unavoidable, contact your sales agent to request proper shield construction.)
- Place where the power cord of the server must be connected to an AC outlet that shares the outlet of another device with large power consumption.
- Place near equipment that generates power noise (e.g., contact spark at power-on/power-off of commercial power supply through a relay). If you must install the server close to such equipment, request your sales agent for separate power cabling or noise filter installation.

Rack Installation Kit Assembly

This section provides the assembly instructions for mounting the server into a standard 19-inch rack cabinet.

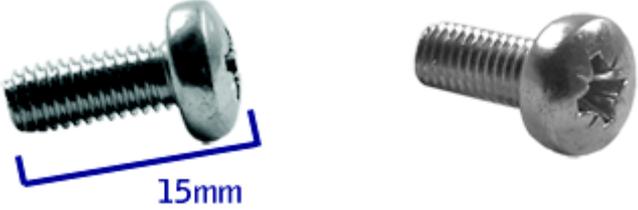
Note: The server shown in the pictures may be slightly different from your server system.

Unpacking the Rack Installation Kit

Although the rack installation kit is inspected and carefully packaged at the factory, damage may occur during shipping. Follow these steps for unpacking.

1. Visually inspect the shipping containers; notify your carrier immediately of any damage.
2. Carefully remove the rack mounting hardware and verify the parts.

Note: The quantities noted below are subject to change without notice.

| | |
|---|--|
| <p>2 sets of support rail assemblies (1 front and 1 rear part for each)</p> |  <p><i>Figure 8: Rail assembly front and rear parts (right side shown)</i></p> |
| <p>6 (minimum) self-tapping screws (TCB M5) for support rails front and rear parts assembling</p> |  <p><i>Figure 9: Self-tapping screws</i></p> |

6 (minimum) washers, to be used with the 6 self-tapping screws (["Figure 9: Self-tapping screws"](#))



Figure 10: Washers for the self-tapping screws

8 (minimum) flange head screws (M5x12) used to fix the support rail assemblies to the rack



Figure 11: Flange head screws

4 washer plates, to be used with the flange head screws (["Figure 11: Flange head screws"](#))

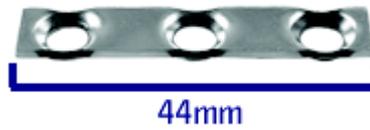


Figure 12: Washer plates

Rack mounting frame

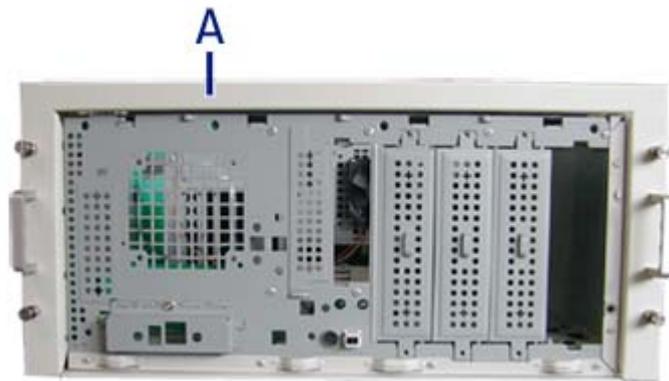


Figure 13: Rack-mounting frame (A)

| | |
|-------------------------------------|--|
| 2 Handles (A) | |
| 4 Handles fixing screws (B) | |
| 1 Hex key for frame grub-screws (C) | |

Figure 14: Handles (A), screws (B) and hex key (C)

If some of the parts listed above are missing or if the hardware is damaged, notify your server representative.

Additional Parts for Future Use

| | |
|-----------------------------|--|
| 8 (minimum) screws (TCB M5) | |
| 8 (minimum) washers | |

Figure 15: Screws

Figure 16: Washers

Before You Begin

Before you begin, please review the following cautions, warnings, and general guidelines.

⚠ Warning

Be sure that power to the system is turned off and unplugged. All voltage is removed only when the power cords are unplugged.

- Avoid excessive vibration and shock. Dropping an electronic component can cause serious damage.

- Do not disconnect or remove parts other than those specified in the procedure.
- Do not touch I/O connector pins.
- All screws are Phillips-head, unless otherwise specified.
- On completion of any assembly or reassembly, perform a power-on test. If a fault occurs, verify that the assembly or reassembly was performed correctly. If the problem persists, *see “Solving Problems” on page 240.*

Static Precautions

An electrostatic discharge (ESD) can damage disk drives, option boards, and other components. You can provide some ESD protection by wearing an anti-static 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.

Assembly

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

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

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

Warning

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

server power cord is plugged into an AC outlet that is part of the rack, then you must provide proper grounding for the rack itself. If server power cords are plugged into wall AC outlets, the safety grounding conductor in each power cord provides proper grounding only for the server. You must provide additional, proper grounding for the rack and other devices installed in it.

Caution

Temperature: The operating temperature of the server, when installed in an equipment rack, must not go below 5 °C or rise above 35 °C. Extreme fluctuations in temperature can cause a variety of problems in your server.

Ventilation: The equipment rack must provide sufficient airflow to the front of the server to maintain proper cooling. It must also include ventilation sufficient to exhaust a maximum of 4,100 Btu's per hour for the server. The rack selected and the ventilation provided must be suitable to the environment in which the server will be used.

 **Note:** For vertical reference, every three screw holes on the rack vertical mounting rail are equal to 1U (1.75 inches).

Mounting holes in the vertical rails of equipment racks are commonly spaced in a 5/8 x 5/8 x 1/2-inch sequence. Perform the following steps carefully; brackets must be mounted with precision to allow room for the next server you install in a rack.

Assembling the Front and Rear Parts of Support Rails

The support rails are made of a front and a rear part. Those two parts may be adjusted to fit the distance between the front and rear vertical rails of the rack.

1. Assemble the front (A) and rear (B) parts of the right support rail with 3 self tapping screws (C) and 3 flat washers (D).

 **Note:** When using self-tapping screws, we recommend you tighten the screw for 3 quarters of a turn, and loosen for 1 quarter. Repeat this cycle until the screw is completely tightened.

2. Adjust the total length to fit the distance between the front and rear vertical rails of the rack before securing the screws.



Figure 17: Right support rail front and rear parts, fixing screws and washers

3. Assemble the left support rail the same way.

Installing the Support Rails

1. Install the right support rail (A) as shown in illustration.
2. Secure the rail to the front (B) and rear (C) vertical mounting rails with two flange head screws (D) and the washer plate (E).

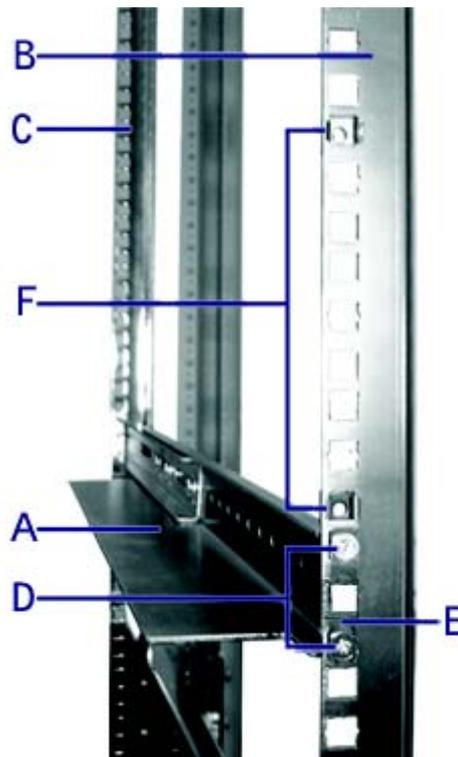


Figure 18: Installing the right support rail

3. Insert two caged nuts (F) as shown in the figure above. One in the hole just above the support rail, the other one eight holes above. Insert the caged nuts in the front mounting rail as follows (*see "Figure 19: Inserting a caged nut"*):
 - Position the caged nut on the inside of the front vertical mounting rails.
 - Hook the side lip of a caged nut into the square hole in the rail.

- Push the other side lip of the caged nut into the square hole in the rail until it is secured.
- Repeat for each caged nut.

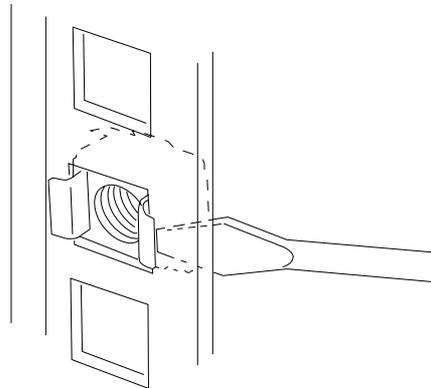


Figure 19: Inserting a caged nut

4. Repeat steps 1 to 3 for the left support rail.

Attaching the Handles to the Rack Mounting Frame

Two handles are attached to the rack mounting frame. The handles are used to easily slide the server in and out of the rack.

! Warning

The handles are only used to slide the server in and out of the rack. **DO NOT** use these handles to carry the server.

Attach the handles ([A in "Figure 14: Handles \(A\), screws \(B\) and hex key \(C\)"](#)) to the rack mounting frame with two screws ([B in "Figure 14: Handles \(A\), screws \(B\) and hex key \(C\)"](#)).

Installing the Rack Mounting Frame on the Server

Install the rack mounting frame on the server as follows:

1. Remove the door as described in ["Removing the Left Side Door" on page 99](#).
2. Remove the front panel as described in ["Removing the Front Panel" on page 103](#).

3. Install the rack mounting frame (A) on the server (B) as shown in the figure below.

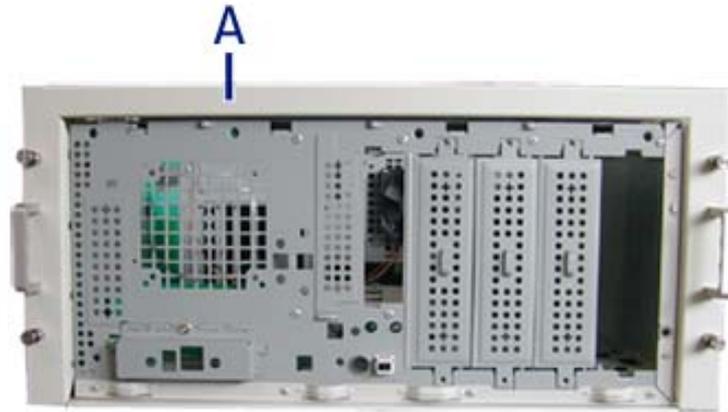


Figure 20: Installing the rack mounting frame on the server

4. Slide the rack mounting frame on the server until the front of the server protrude a little from the frame.
5. Replace the front panel.
6. Replace the right side door.
7. Align the rack mounting frame (A in the figure above) with the front panel (B).
8. Secure the frame with the grub screws (C in the figure below, four on each side) using the hex key (C in "[Figure 14: Handles \(A\), screws \(B\) and hex key \(C\)](#)"). Tighten the screws to fix the frame to the server, but do not overtighten in order to prevent damage to the server case.

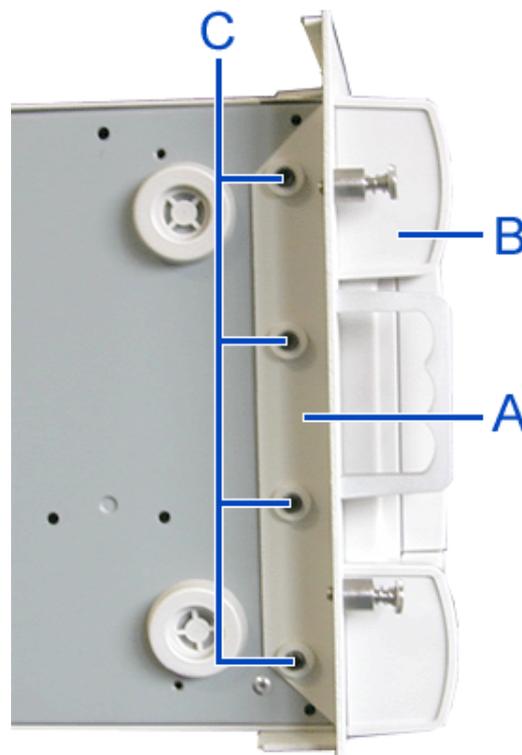


Figure 21: Securing the rack mounting frame

Installing the Server in the Rack Cabinet

Warning

The system can weigh up to 23.5 kg. If it contains numerous optional boards and peripheral devices, it will weigh more. To avoid personal injury, make sure you have at least one person help you lift or move the system.

Do not use the handles of the rack mounting frame to lift the server.

1. Lift the server onto the support rails and slide it toward the rear of the cabinet.
2. Secure the server to the vertical mounting rails with the four thumbscrews (A in the figure below).



Figure 22: Securing the server to the rack cabinet

Making Connections

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

Caution

Damage to the system may result if the keyboard/ mouse cable is inserted or removed when power is applied to the system.

Inserting a telephone line connector into a LAN RJ-45 port may result in personal injury and equipment damage.

Generic recommendations

- Power off the server and the peripheral device before making the connections. Connecting a powered peripheral device to a powered server will cause malfunctions and failures.
- To connect a third-party peripheral device or interface cable to the server, consult with your service representative for the availability of such a device or cable. Not all third-party devices are compatible with the server.
- To connect the provided keyboard and mouse, plug their connectors to the server with the "Δ" mark on the connectors facing right.
- Do not connect the serial ports directly to a telephone line.
- Make all the necessary connections before connecting the power cord.

Connecting the Power Cord

Plug the female end of the AC power cord shipped with your system into the input receptacle on the rear of the power supply shipped with your system.

Plug the male end of the power cord into NEMA 5-15R outlet for 100-120 VAC or NEMA 6-15R outlet for 200-240 VAC.

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

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

UPS Units

When connecting the power cord to a power control unit such as a UPS unit, confirm that the power control unit is powered OFF. Connecting the power cord while power is supplied to the power control unit may cause a failure.

1. Connect the server power cord to the power outlets on the rear of the UPS. Refer to the manual that comes with the UPS for details.
2. Change the BIOS Setup Utility of the server to link with the UPS power supply. Refer to [“Using the BIOS Setup Utility” on page 273](#) for more information.

Warning

A power cord is provided for the power supply shipped with your system. Do not attempt to modify or use the supplied AC power cord if it is not the exact type required.

Using the System

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

When using the system the following precautions should be observed:

- Make sure you power off the system before connecting or disconnecting cables between the system and peripheral devices. Connecting or disconnecting the cables while the system is powered on may cause malfunction or failures within the system.
- If applicable, check that the access lamp on the diskette drive is unlit before turning off the system or ejecting the floppy disk. Turning off the system or ejecting the floppy disk while the access lamp is lit may damage data being stored on the floppy disk.
- After turning off the system, wait at least 10 seconds before turning it on again. Cycling the power immediately may cause malfunction or failures of the system.
- Before relocating the system, turn off the power and unplug the power cord from the outlet. Moving the system when it is powered may cause malfunction or failures of the system.
- Clean the system regularly. Regular cleaning prevents failures of the system 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 system. A non-qualified option may be mounted or connected to the system, but it may fail to operate normally or even cause failures. These types of failures are not covered under warranty.

Powering On your System

Caution

Before turning on the server:

- Some optional boards require setups with the BIOS setup utility before installation. Check on the board specifications to find out whether it requires pre-installation setups before actually installing the board.
- Some installed optional devices or connected peripheral devices require setups before proceeding to the next step.

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

Power on your system as follows.

1. Make sure all external devices, such as a video display, keyboard, and mouse (optional) have been connected, and the power cords are connected.
2. Power on the video display and any other external devices.
3. If applicable, open the door behind which the power button is located.

Note:

- *If the system power cord(s) is connected to a power control unit such as an UPS (Uninterruptible Power Supply) make sure that the power control unit is powered on.*
 - *Connect the power cord and wait a few seconds before pressing the POWER switch. The POWER/SLEEP switch does not work in a few seconds after connecting the power cord due to firmware start-up.*
-

4. Press the POWER button to power on the system. The POWER lamp lights green. If it does not light, make sure that the ac power cord is connected to a functional ac power source.

After a few seconds your system begins the internal Power-On Self Tests (POST). The POST automatically checks the system board, CPU(s), memory, keyboard, mouse, and most installed peripheral devices. It also displays the start messages of the BIOS setup utility during execution. Refer to [“POST Execution Flow” on page 71](#) below for more information.

The POST check results should be especially monitored in the following cases:

- When the system is being used for the first time.

- When the system appears to fail.
- When the system beeps many times between power-on and the OS start-up.
- When an error message appears on the screen.

 **Note:** For error messages that appear on the display unit, refer to *“POST Error Messages”* on page 266.

Caution

Always allow the POST to complete before powering down your system.

If you have problems powering on your system, [see “Solving Problems” on page 240](#).

If an operating system was factory-installed on your system, you can start using it.

If not, insert the ExpressBuilder disc into the optical disc device, reboot the system and follow the screen prompts to run ExpressBuilder.

POST Execution Flow

The following describes the progress of POST in the chronological order.

Caution

- Do not power off the server while the POST is in progress.
 - Do not make press any key or perform mouse operations while the POST is in progress.
 - Some system configurations may display the message "Press Any Key" to prompt a key entry. This message is driven by the BIOS of an installed optional board. Make sure to read the manual that comes with the optional board before pressing any key.
 - Once you installed/removed an optional PCI board or moved it to another slot, a message indicating an incorrect board configuration may be displayed and suspend the POST when the server is powered on.
In such a case, press **F1** to continue the POST. The board configuration can be made using the utility described later.
-

1. A few seconds after the power-on, the POST starts checking the memory. The count message of the basic and expansion memory appears at top left on the display unit screen. Depending on the memory size of the server, this check

may take a few minutes to complete. When rebooting the server, you may have to wait for about 1 minute before anything is displayed on the screen.

2. Messages appear once the memory check is completed. They indicate that the system has detected the CPU, keyboard, and mouse.
3. After a few seconds, the POST displays a message prompting you to launch the BIOS SETUP utility, which is stored in the system memory of the server. This message appears at bottom left on the screen.

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

Launch the BIOS setup utility when an error message is displayed in order to change the settings to meet the server requirements. In order to launch the BIOS setup utility, press **F2** while the above message is displayed. Refer to [“BIOS Setup Utility” on page 273](#) for more information.

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

4. If the POST detects the optional add-in card, it displays a message prompting you to launch the add-in card BIOS configuration utility. (Ignore the message. POST will automatically proceed a few seconds later.)

Refer to the manual that comes with the optional add-in card for more information.

5. If you set a password using the BIOS SETUP utility, the password entry screen appears upon successful completion of POST.

Up to three incorrect password entries will be accepted. Afterwards, turn off the power and wait about ten seconds before powering on the server.

Caution

Do not set a password before installing an OS.

6. The OS starts when the POST is completed.

POST Error Messages

When the POST detects an error, it displays an error message on the display unit screen or emits a beep code. Refer to [“POST Error Messages” on page 266](#) and [“POST Error Beep Codes” on page 269](#) for more information.

Caution

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

Powering Off your System

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

To turn the system power off:

1. Shutdown the operating system (OS). In most cases, this will shut down the system after a few seconds (the POWER lamp turns off). This is called a software power-off.

If necessary, press the POWER switch on the front of the computer chassis again to power off the system. The POWER lamp turns off.

2. Power off the peripheral devices.

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

Sleep Switch

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

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

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

 **Note:** *The operational level in the power-saving mode depends on the OS in use.*

Forcing a Power Shutdown

A forced power shutdown can be used when performing a soft power-off or pressing the power on/off switch does not power off the system.

To perform a forced power shutdown, press on the power on/off switch located on the front panel of the system for at least 4 seconds to force the system power off.

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

Caution

Depending on your configuration:

- 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.
 - If the processor is heated excessively, the circuit for protecting expensive components is started. In this case, the POWER/SLEEP switch cannot be used to control the power because the system is entered into the reset status. Pull out the power cord and turn off the power. After a while, check the operating environment (including the ambient temperature). Connect the power cord and turn on the power. It may be necessary to leave the system powered-off until it is cooled down (about five minutes in normal).
-

Resetting the System

Caution

Resetting the system clears the DIMM memory and the data in process. To reset the system when it is not frozen, make sure that no processing is in progress.

■ Soft reset

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

Configuring Your System

Configuration and setup utilities are used to change your system configuration.

■ RAID Configuration Utilities

Depending on your configuration (SATA, SCSI, SAS, combination of these) and on your disk drive controller, one or several RAID Configuration Software Utilities may be available on your system. These software utilities may allow you to perform some of the following actions: configure the RAID level, setup arrays, format the drives, etc.

■ BIOS Setup Utility

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

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

For more information about the BIOS Setup Utility, see [*“BIOS Setup Utility” on page 273.*](#)

Configuring RAID

RAID Configuration Utility

The RAID (Redundant Array of Inexpensive Devices) option available for your system is either a RAID controller board, a RAID chipset on the motherboard, or both (depending on your configuration) which gives your system the added security of fault tolerance.

- If you want to change the RAID level or add additional hard disk drives to the array, use the RAID configuration utility. The RAID configuration utility is included with the RAID controller.
- If you are adding the RAID controller to an existing system, the RAID configuration utility allows you to configure your disk array before reinstalling your network operating system. The RAID controllers support various versions of RAID technology (referred to as RAID levels). To use any RAID level, you must configure the RAID controller using the RAID configuration utility prior to installing your Network Operating System.

For an explanation of this utility, check this user's guide for basic information, and refer to the documentation that comes with the RAID controller (the manufacturer's documentation is generally included on the ExpressBuilder disc). It describes RAID technology and provides tips on making your array perform well in your specific application. It also covers array hardware preparation, configuration, and initialization. After completing the steps in the manual, you can install your Operating System.

RAID Levels

| RAID Configuration | Number of required hard disk drives |
|--------------------|-------------------------------------|
| RAID 0 | 2 |
| RAID 1 | 2 |
| RAID 10 | 4 |
| RAID 5 | 3 |

RAID 0 and RAID 1

■ RAID0 (striping)

When a logical drive is striped, the read and write blocks of data are interleaved between the sectors of multiple disk drives. Performance is increased, since the workload is balanced between drives or “members” that form the logical drive.

Identical drives are recommended for performance as well as data storage efficiency. The logical drive's data capacity is equal to the number of drive members multiplied by the smallest logical drive member's capacity.

RAID 0 Stripe interleaves data across multiple drives For example, one 100GB and three 120GB drives will form a 400GB (4 x 100GB) logical drive instead of 460 GB.

Warning

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

■ RAID1 (mirroring)

When a logical drive is mirrored, identical data is written to a pair of disk drives, while reads are performed in parallel. The reads are performed using elevator seek and load balancing techniques where the workload is distributed in the most efficient manner. Whichever drive is not busy and is positioned closer to the data will be accessed first.

With RAID 1, if one disk drive fails or has errors, the other mirrored disk drive continues to function. This is called Fault Tolerance. Moreover, if a spare disk drive is present, the spare drive will be used as the replacement drive and data will begin to be mirrored to it from the remaining good drive.

Due to the data redundancy of mirroring, the capacity of the logical drive is only the size of the smallest disk drive. For example, two 100GB disk drives which have a combined capacity of 200GB instead would have 100GB of usable storage

when set up in a mirrored logical drive. Similar to RAID 0 striping, if disk drives of different capacities are used, there will also be unused capacity on the larger drive.

 **Warning**

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

Raid 10 & RAID 5

These RAID levels may also be available on your system. Browse through the next sections of this User's Guide for more information.

■ RAID 10

Mirror/Stripe combines both of the RAID 0 and RAID 1 logical drive types. It can increase performance by reading and writing data in parallel while protecting data with duplication. At least four disk drives are needed for RAID 10 to be installed.

With a four-disk-drive logical drive, one drive pair is mirrored together then striped over a second drive pair.

The data capacity is similar to a RAID 1 logical drive, with half of the total storage capacity dedicated for redundancy. An added plus for using RAID 10 is that, in many situations, such a logical drive offers double fault tolerance. Double fault tolerance may allow your logical drive to continue to operate depending on which two disk drives fail.

■ RAID 5

RAID level 5 organizes data across the disk drives of the logical drive, and distributes parity information across the disk drives along with the data blocks.

This organization allows increased performance by accessing multiple disk drives simultaneously for each operation, as well as fault tolerance by providing parity data. In the event of a disk drive failure, data can be re-calculated by the RAID system based on the remaining data and the parity information.

The adjustable block size of the RAID 5 logical drive allows for performance tuning based on the typical I/O request sizes for your system. The block size must be set at the time the logical drive is created and cannot be adjusted dynamically.

RAID 5 makes efficient use of hard drives and is the most versatile RAID Level. It works well for file, database, application and web servers.

The capacity of a RAID 5 logical drive is the smallest disk drive size multiplied by the number of disk drives, less one. Hence, a RAID 5 logical drive with four 100 GB disk drives will have a capacity of 300 GB. A logical drive with two 120 GB disk drives and one 100 GB disk drive will have a capacity of 200 GB.

RAID Configuration using SuperBuild™

Please refer to the *Promise SuperTrak Disk Array Controller User's Guide* included on the ExpressBuilder disc for more information.

RAID Configuration using the LSI Logic Software RAID Configuration Utility

Use this utility to set up the RAID configuration of your hard disk drives.

 **Note:** This utility cannot be run via the remote console feature of DianaScope.

Running the Setup Utility

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

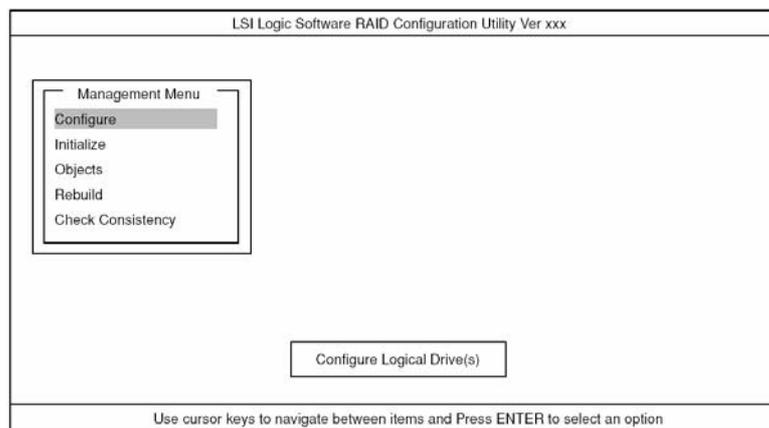


Figure 23: LSI Logic Software RAID Configuration Utility TOP Menu (Management Menu)

 **Note:** To exit the utility, press **Esc** in the TOP menu of LSI Logic Software RAID Setup Utility. Select **Yes**, and then press **Ctrl + Alt + Delete** to reboot the server when prompted to do so.

Tree Menu

- + : Selection/execution parameter
- ← : Setting parameter.
- : Information display

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

Table 3: Tree Menu

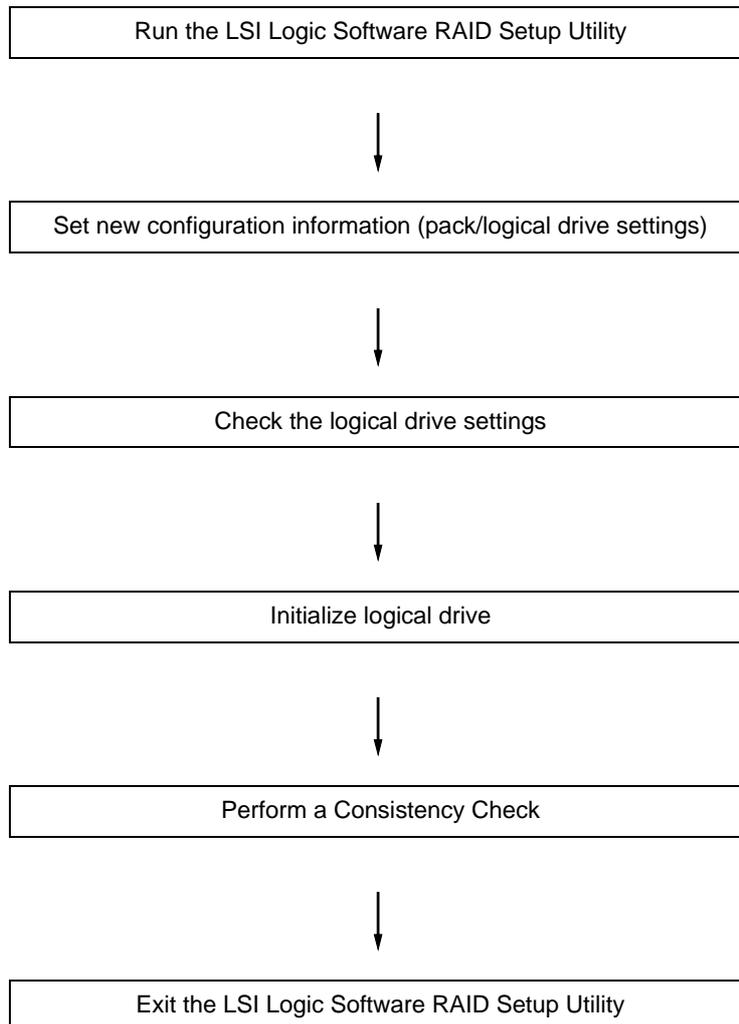
| Menu | | Description |
|-------------------------|-------------------------|---|
| +Configure | | Performs Configuration settings |
| +Easy Configuration | | Set configuration (Using fixed value) |
| +New Configuration | | Set new configuration |
| +View/Add Configuration | | Additional setting / viewing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

Table 3: Tree Menu

| Menu | | Description |
|--------------------------------|-------------------|---|
| +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 the Setup Utility

Creating/Adding a 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 prompted to proceed, select **Yes**.

The *Scan Device* starts (the scanning information is displayed at the bottom of the screen). Once the *Scan Device* is completed, the *New Configuration - Array Selection Menu* screen appears.

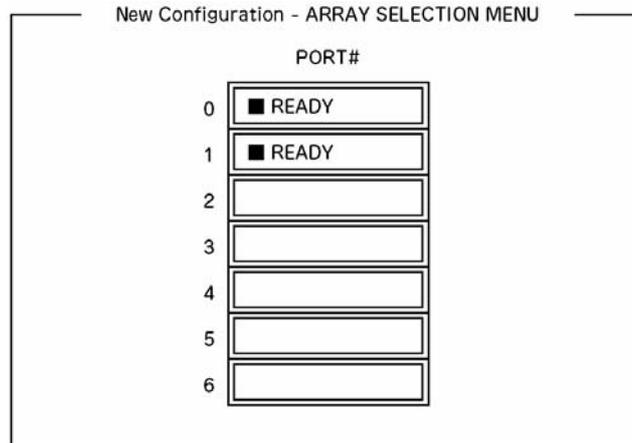


Figure 24: *New Configuration - Array Selection Menu* screen

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

The display for the selected hard disk drive changes from *Ready* to *Online*.

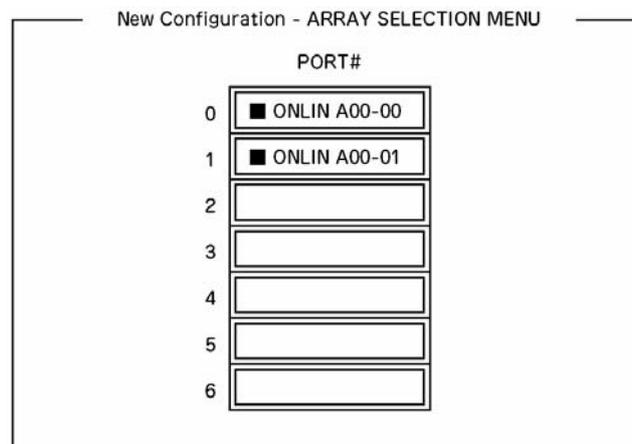


Figure 25: *New Configuration - Array Selection Menu* screen

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

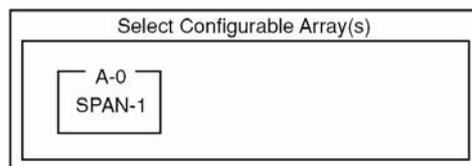


Figure 26: *Select Configurable Arrays* screen

6. Press **F10** to create a logical drive.

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

| Logical Drives Configured | | | | | |
|---------------------------|------|-------|----------|--------|--------|
| LD | RAID | Size | #Stripes | StrpSz | Status |
| 0 | 1 | xxxMB | 2 | 64KB | ONLINE |

| Logical Drive0 |
|----------------|
| RAID = 1 |
| Size = xxxxMB |
| DWC = On |
| RA = On |
| Accept |
| Span = NO |

Figure 27: Logical Drives Configure screen

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 |
| 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 |

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

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

- (5) Span: Sets the Span.

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

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

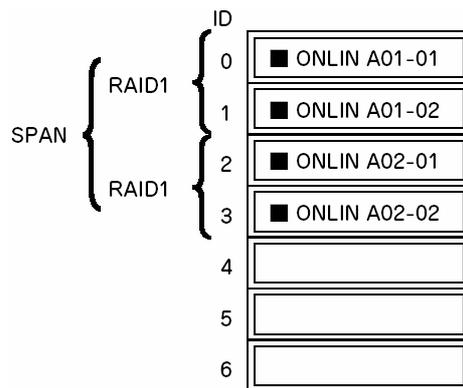


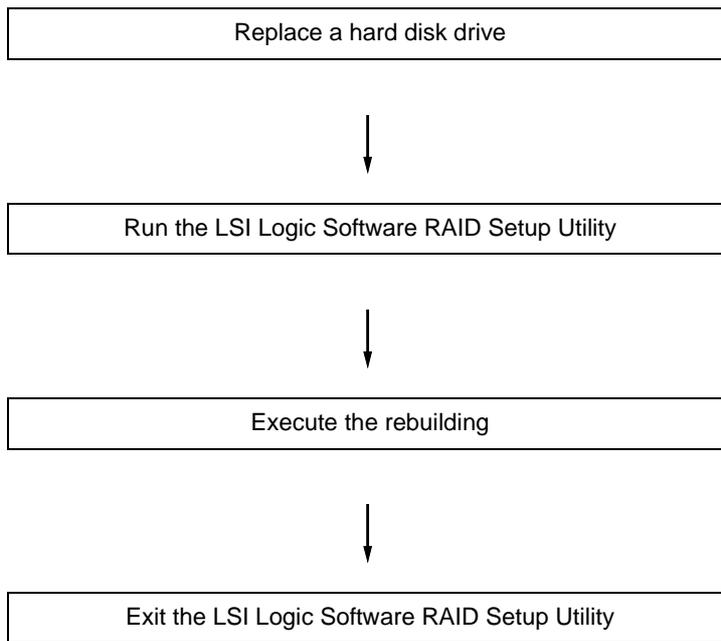
Figure 28: Spanning of RAID1

8. When all the settings are completed, select *Accept* and then press **Enter** to create the logical drive.
The created logical drive is displayed in the *Logical Drive Configured* screen.
9. After creating a logical drive, press **Esc** to close the screen.
Go back to the *Save Configuration?* screen and then select *Yes* to save the configuration.
10. Once it is confirmed that the configuration has been saved, press **Esc** to return to the *Top* menu screen.
11. On the *Top* menu screen, select *Objects* → *Logical Drive* → *View/Update Parameters* to check the logical drive information.
12. Select *Initialize* in the *Top* menu screen.
13. When the *Logical Drives* screen appears, move the cursor to the logical drive to be initialized, and press **Space**.
The logical drive is selected.
14. Press **F10** to start the initialization, and press **Yes** when prompted to do so.
When the progress bar in the *Initialize Logical Drive Progress* screen reaches 100%, initialization is completed.
15. Execute a Check Consistency on the logical drive that has been initialized.
Refer to [“Check Consistency” on page 92](#) for more information.
16. Press **Esc** to return to the *Top* menu and exit the LSI Logic Software RAID Setup Utility.

⚠ Caution

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

Manual Rebuild



1. Replace a hard disk drive and power 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.

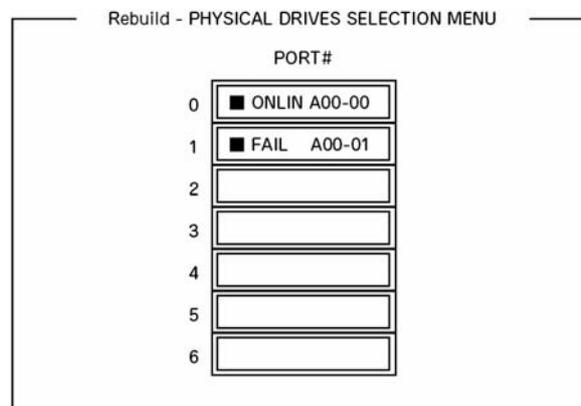


Figure 29: Rebuild – Physical Drives Selection Menu

4. Move the cursor onto the hard disk drive displaying "FAIL" and then press **Space** to select it.

Several hard disk drives can be selected (simultaneous rebuilding.)

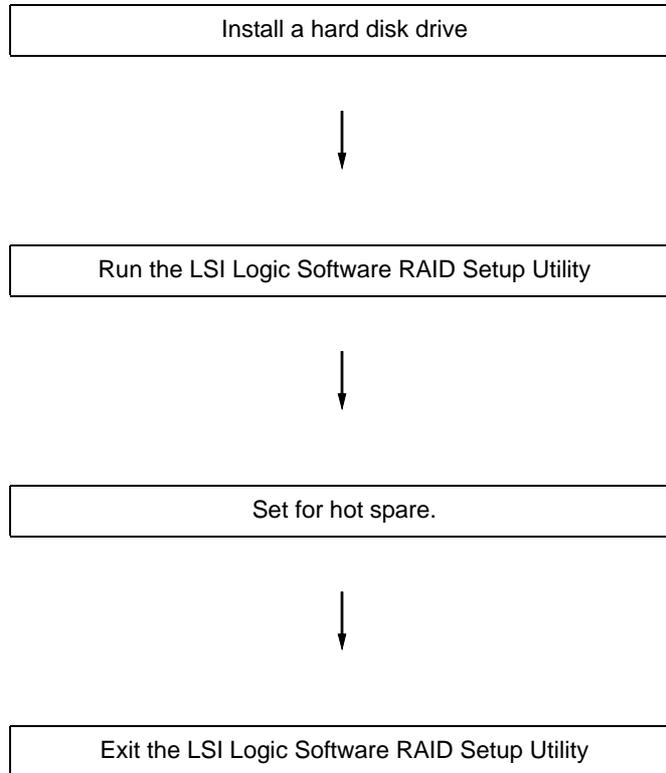
5. The *Fail* indication for the selected hard disk drive starts blinking.
6. Once the hard disk drive is selected, press **F10** to start rebuilding.
7. Press *Yes* when prompted to do so.

The rebuild process starts.

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

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

Setting a Hot Spare



- Install a hard disk drive to be used as hot spare, and then power 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.

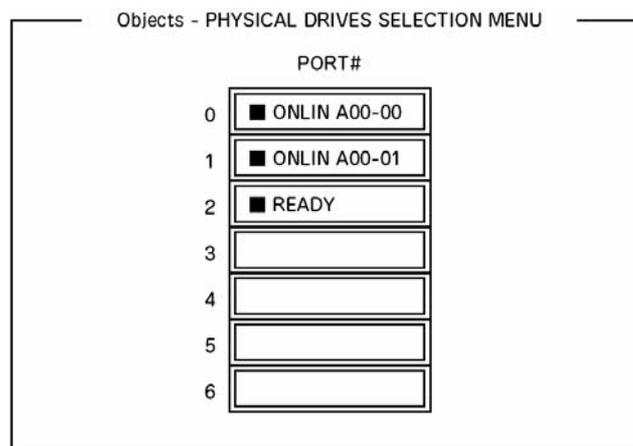


Figure 30: *Objects - Physical Drive Selection Menu* screen

4. Move the cursor onto the hard disk drive to be used as hot spare and press **Enter**.
5. The "Port #X" screen appears. Select *Make HotSpare*.
6. Select *Yes* when prompted to do so.
The hard disk drive indication changes to "HOTSP."
7. Press **Esc** to return to the *Top* menu and exit the LSI Logic Software RAID Setup Utility.

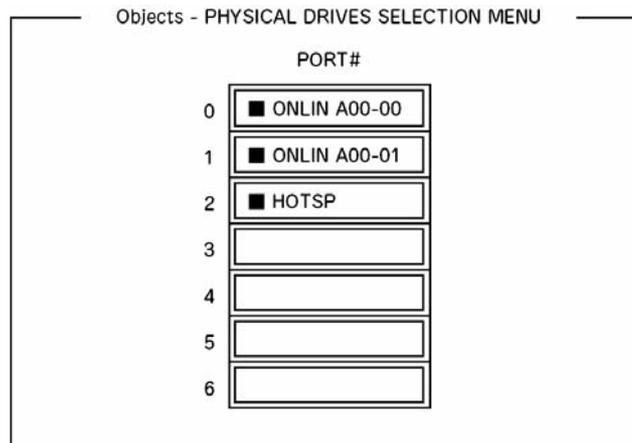
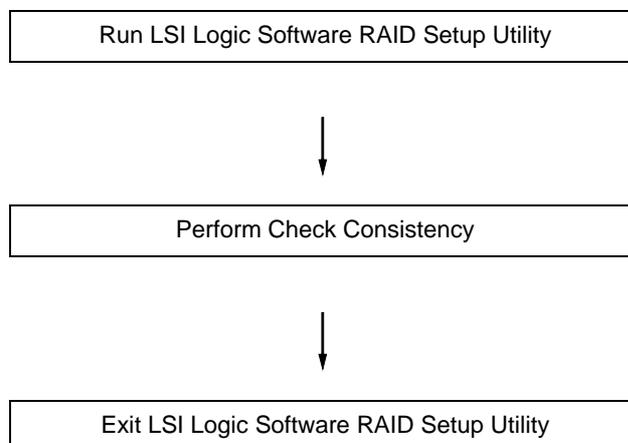


Figure 31: Objects - Physical Drive Selection Menu screen

! 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



1. Run the LSI Logic Software RAID Setup Utility.

2. 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. Once the logical drive is 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 reaches 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 a Check Consistency after creating a configuration.
 - Check Consistency has two modes: "check and recover" and "check only".
-

Others Operations

Clear Configuration

Clears the configuration information. Select *Configure* → *Clear Configuration* from the *Top* menu. Executing *Clear Configuration* clears all the configuration information on the disk array controller and hard disk drives. The configuration information on all the 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 the configuration again.
 - Use the MegaRAID Storage Manager to delete a specific logical drive.
-

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.

The value range is 0% to 100%. The Default value (recommended) is 30%.

Hard disk drive information

Checks the hard disk drive information.

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

RAID Configuration using the MegaRAID Configuration Utility

Please refer to the documentation included on the ExpressBuilder disc.

Upgrading Your System

General Safety 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 connects the system to 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 the power cord before opening your system can result in personal injury and equipment damage.

Caution

Operating your system with the top covers removed can damage your system components.

For proper cooling and airflow, always replace the top covers before powering on your system.

Warning

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

To avoid the possibility of a burn, be careful when removing or installing components that are located near processors.

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

Static Precautions

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

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

Equipment Log

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

Tools Recommended for Upgrading Your System

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

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

Preparing Your System for Upgrade

To prepare your system for installation or removal of system components perform the following procedure:

1. Observe the safety and ESD precautions listed under [“General Safety Information”](#) and [“Static Precautions”](#) at the beginning of this chapter.
2. Shutdown the operating system (OS).
3. If necessary, press the power on/off switch on the front panel of the system ([See “Powering On your System” on page 70.](#)). The power-on LED goes out.
4. Power off the peripheral devices.
5. Unplug the system power cord(s) from the AC wall outlet(s).

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

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

Removing or Installing the Left Side Door

The right side door provides access to the disk drive bays, to the motherboard and to the 5.25 and 3.5-inch bays.

Removing the Left Side Door

1. Make sure the power switches for the computer, video monitor and any peripheral devices are turned OFF and unplug the power cord (see [“General Safety Information” on page 96](#)).
2. Disconnect the monitor and peripheral devices (printers, for instance) from the system.
3. Unlock the key lock.

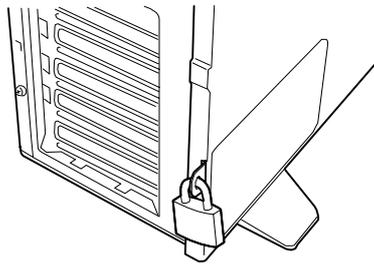


Figure 32: Key lock

4. Fold the four stabilizers at the bottom of the server.

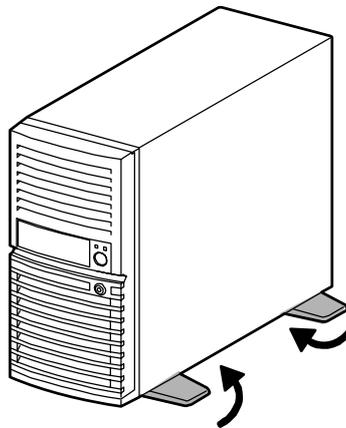


Figure 33: Folding the stabilizers

5. Lay the server on its right side.

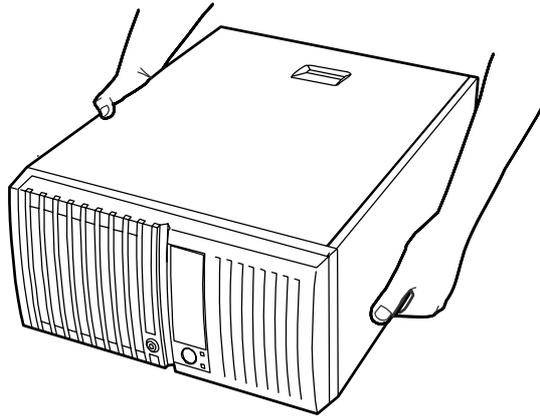


Figure 34: Laying the server on its right side

6. Remove the two screws (A) from the rear of the server.

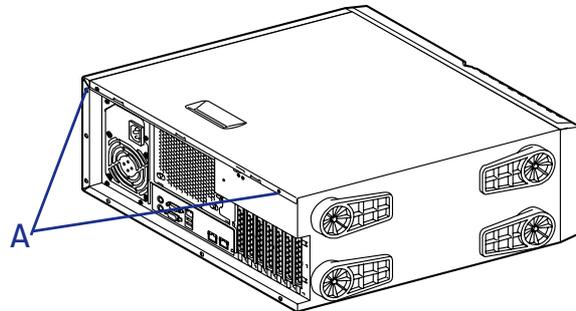


Figure 35: Removing the screws

7. Carefully slide the door about two centimetres towards the back of the unit.

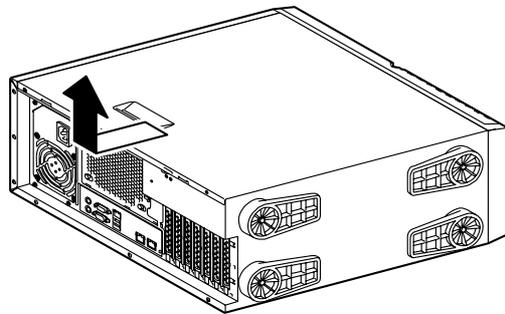


Figure 36: Door Release Latch

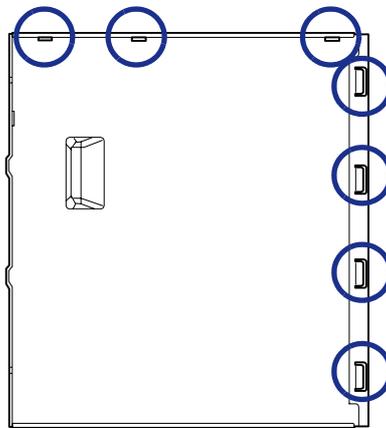
8. Lift the door away from the computer

Replacing the Left Side Door

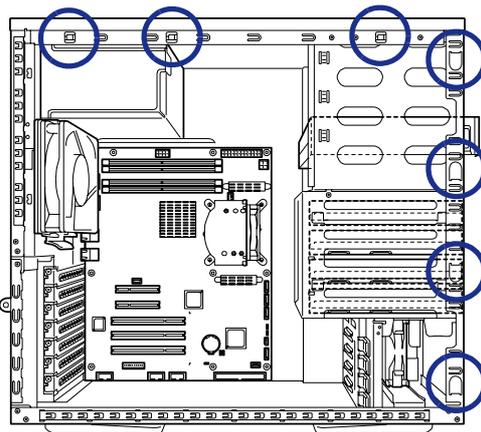
Avoid damaging your system - before replacing the door, make sure no cables or other devices protrude from the chassis.

 **Note:** If you have previously removed the front panel, be sure to fasten it securely to the chassis before restoring the cover. The front panel must be securely connected to the chassis before you replace the cover.

1. Lay the server on its right side.
2. Take a few moments to examine the interior side of the cover, and notice the location of the hooks.



3. Leaving about 1 centimetre to slide the cover forward, lay the cover on the chassis, and check that the slots on the frame are ready to fit with their corresponding metal hooks.



4. Slide the cover forward as far as it will go, and make sure the hooks are properly inserted; the cover, the chassis and the front panel should fit squarely together.

5. Secure the two screws on the back of the server.

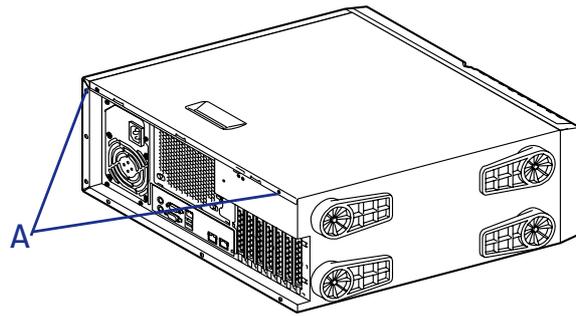


Figure 37: Securing the screws

6. Lock the key.

Removing and Replacing the Front Panel

Removing the Front Panel

1. Make sure the power switches for the computer, video monitor and any peripheral devices are turned OFF and unplug the power cord (see [“General Safety Information” on page 96](#)).
2. Disconnect the monitor and peripheral devices from the system.
3. Remove the left side door. See [“Removing the Left Side Door” on page 99](#)
4. Locate the four front panel release latches and gently pull them to release the left side of the front panel.

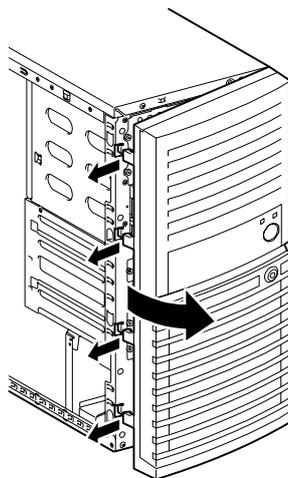
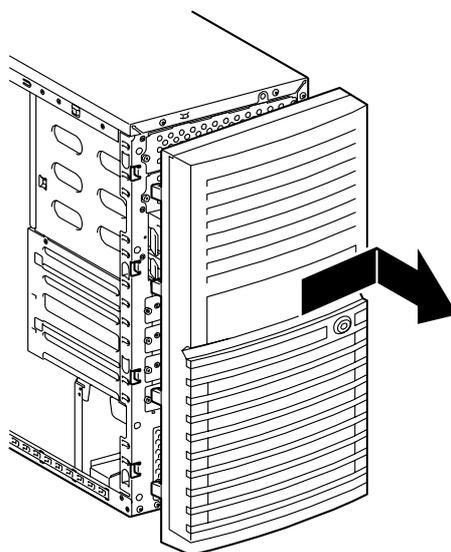


Figure 38: Pop-in Tabs

 **Note:** Pulling hard will damage the tabs securing the right side of the front panel. Please handle with precautions.

5. Once the left side is free, gently slide the front panel to the right to release the tabs, and remove the front panel.



Replacing the Front Panel

1. Insert the tabs located on the left inside of the front panel into their respective slots. You may have to slightly pivot the front panel to aid the process.

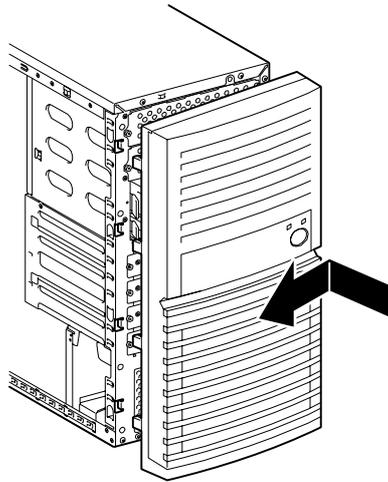


Figure 39: Inserting the hooks

2. Gently press on the left (outside) of the front panel until the 4 remaining tabs are securely inserted into their slots.

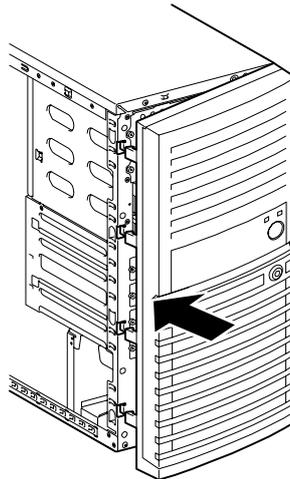


Figure 40: Locking the tabs

3. Replace the left side door. See [“Replacing the Left Side Door” on page 101](#).

Installing or Removing a 5.25-inch Device

This section of the chapter describes how to add and remove 5.25-inch devices. You can install a CD-ROM, DVD-ROM, COMBO DVD-ROM CD-RW or DVD+R9 Drive, tape backup unit, or other 5-25 inch devices in the additional 5.25-inch bay.

Check the installation instructions included with those items for specific installation information.

Also refer to [“Preparing IDE Devices” on page 147](#), [“Preparing SCSI Devices” on page 149](#), or [“Preparing SATA Devices” on page 150](#) depending on your device interface.

Cabling examples are shown in [“Internal Cabling” on page 303](#).

 **Note:** Additional controllers and cables may be required. Please contact your service representative for more information.

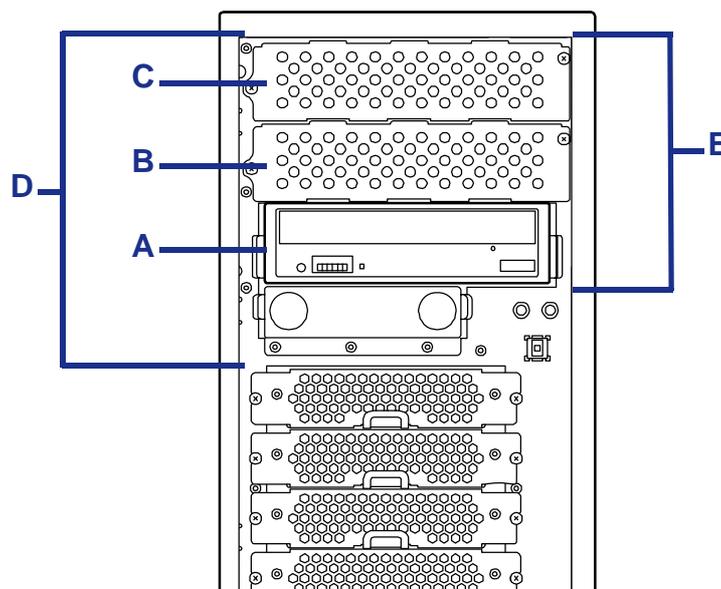


Figure 41: Device Bays

- A: Factory-installed Optical Disc Drive
- B: Additional slot 1
- C: Additional slot 2
- D: File bay
- E: 5.25-inch device bay

Installing an Optional IDE Device

Move the factory-installed IDE optical disc drive to the additional slot 1, and install the optional device in the slot optical disc drive slot.

- Factory-installed optical disc drive: master (factory default)
- Optional IDE device: slave

Adding an SCSI 5.25-inch Device

1. Make sure the power switches for the computer, video monitor and any peripheral devices are turned OFF and unplug the power cord (see [“General Safety Information” on page 96](#)).
2. Disconnect the monitor and peripheral devices (printers, for instance) from the system.
3. Remove the left side door. [See “Removing the Left Side Door” on page 99](#).
4. Remove the front panel. [See “Removing the Front Panel” on page 103](#).
5. Set the termination resistance on the SCSI device (if applicable):
 - When using an SCSI cable without terminator: set it to ON.
 - When using an SCSI cable with a terminator: set it to OFF.
6. Refer to [“Preparing SCSI Devices” on page 149](#).
7. Remove all the cables from the factory-installed DVD-ROM drive and the devices installed in the device bay.

Caution

Be sure to note which device each cable or power lead was attached to.

8. Remove the two screws securing the dummy cover of the additional slot 1.

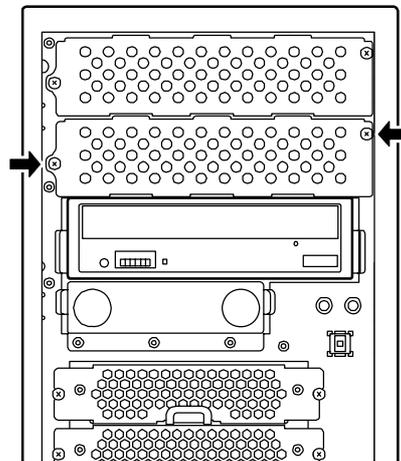


Figure 42: Removing the dummy cover

 **Note:** Keep the removed dummy cover for future use.

- Secure both sides of the device to be installed to the rails with the 4 screws provided with the device.

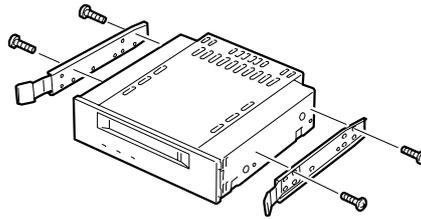


Figure 43: Securing the rails

- Pressing the release tabs on both sides, slowly insert the device into additional slot 1. Push the file bay until it clicks into place.

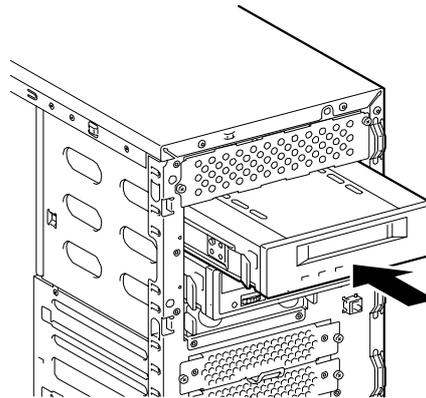


Figure 44: Inserting the device

- Connect the interface and power cables to the 5.25-inch device installed from one side of the server.
- Re-assemble and power on the server.
- Set the parameters, including the transfer rate, using the BIOS utility of the SCSI controller.
Refer to the manual provided with the SCSI controller for more information.
- Install the device driver for the installed device.
Refer to the manual provided with the device for more information.

Adding an IDE 5.25-inch Device

1. Make sure the power switches for the computer, video monitor and any peripheral devices are turned OFF and unplug the power cord (see [“General Safety Information” on page 96](#)).
2. Disconnect the monitor and peripheral devices (printers, for instance) from the system.
3. Remove the left side door. [See “Removing the Left Side Door” on page 99](#).
4. Remove the front panel. [See “Removing the Front Panel” on page 103](#).
5. Remove all the cables from the factory-installed optical disc drive and the devices installed in the device bay.

Caution

Be sure to note which device each cable or power lead was attached to.

6. Press on the tabs on both sides of the factory-installed optical disc drive, and remove the optical disc drive.

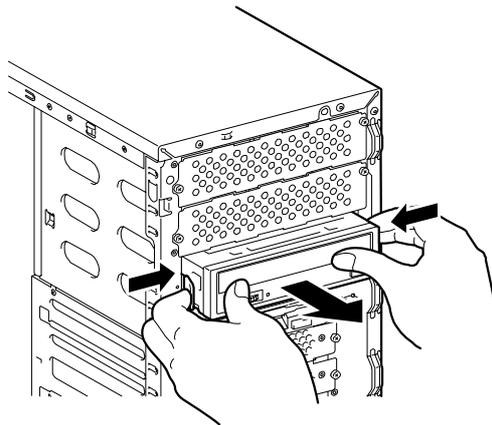


Figure 45: Removing the optical disc drive

7. Secure both sides of the device to be installed to the rails with the 4 screws provided with the device.

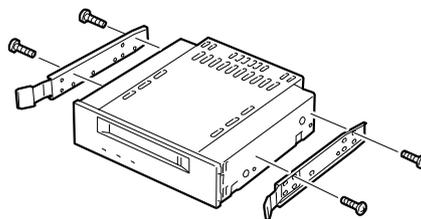


Figure 46: Securing the rails

- Pressing the release tabs on both sides, slowly insert the device into the slot where the factory-installed drive was installed. Push the device until it clicks into place.

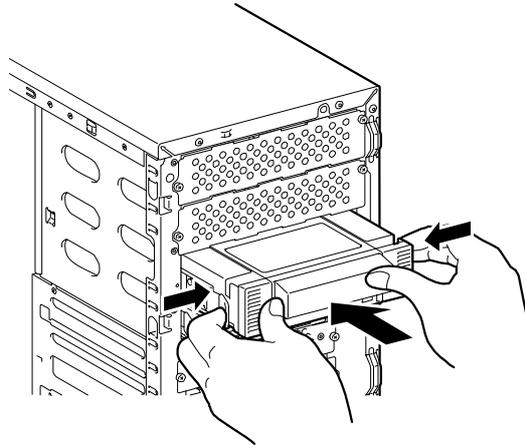


Figure 47: Inserting the device

- Remove the two screws securing the dummy cover of the additional slot 1.

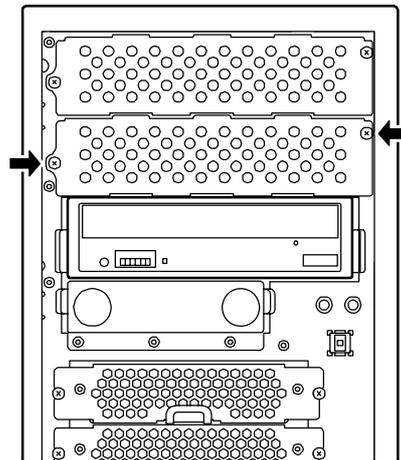


Figure 48: Removing the dummy cover

 **Note:** Keep the removed dummy cover for future use.

10. Pressing the release tabs on both sides, slowly insert the optical disc drive into the additional slot 1. Push the device until it clicks into place.

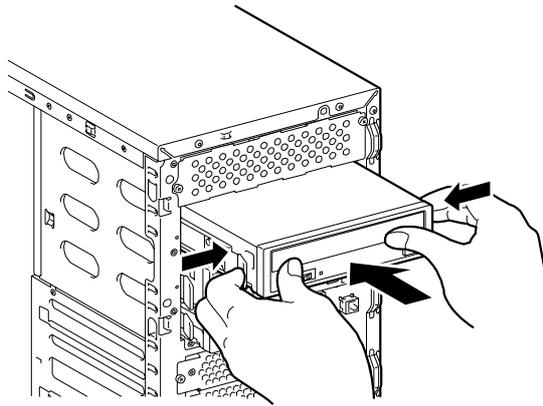


Figure 49: Inserting the device

11. Connect the interface and power cables to the 5.25-inch device installed from one side of the server.
12. Re-assemble and power on the server.
13. Set the parameters, including the transfer rate, using the BIOS utility of the IDE controller.
Refer to the manual provided with the IDE controller for more information.
14. Install the device driver for the installed device.
Refer to the manual provided with the device for more information.

Removing a Device

A 5.25-inch device can be removed in the reverse order of the installation. If you do not install another device, replace the dummy cover.

Installing or Removing Hard Disk Drives

The hard disk drive bay may contain up to four hard disk drives.

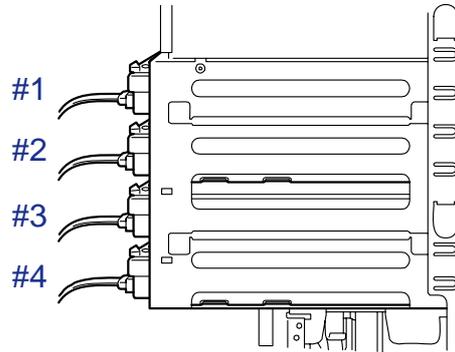


Figure 50: Hard Disk Drive Bay

Plug the HDD in the first bay on the SATA connector 1 on the motherboard, the HDD in the second bay on the SATA connector 2 and so on.

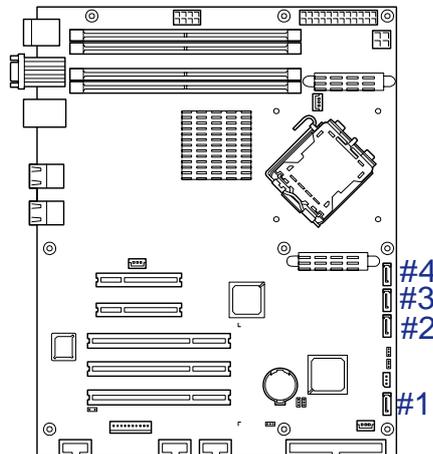


Figure 51: SATA connectors on the motherboard

Cabling examples are shown in [“Internal Cabling” on page 303](#).

Adding a Hard Disk Drive

1. Make sure the power switches for the computer, video monitor and any peripheral devices are turned OFF and unplug the power cord (see [“General Safety Information” on page 96](#)).
2. Disconnect the monitor and peripheral devices (printers, for instance) from the system.
3. Remove the left side door. See [“Removing the Left Side Door” on page 99](#).
4. Open the Front Panel.

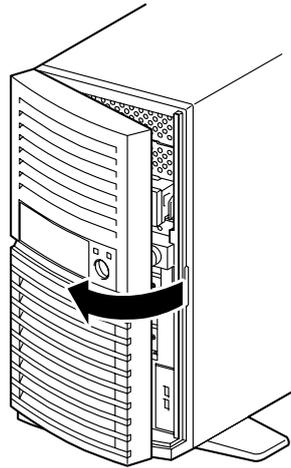


Figure 52: Opening the Front Panel

5. Locate the first available empty drive carrier.
6. Remove the two screws securing the hard disk drive carrier.

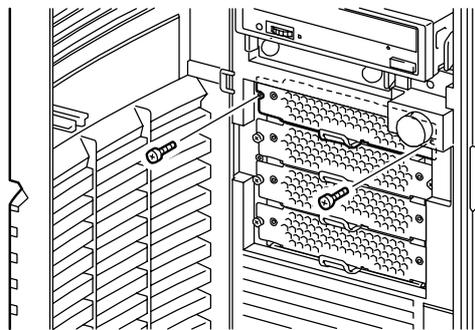


Figure 53: Removing the screws

7. Hold the hard disk drive carrier by the lever and pull it out.

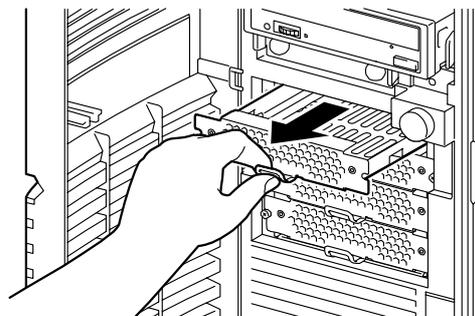


Figure 54: Pulling out the carrier

- Place your new hard disk drive on a flat and rigid place, and put the hard disk drive carrier over it, as shown in the drawing below.

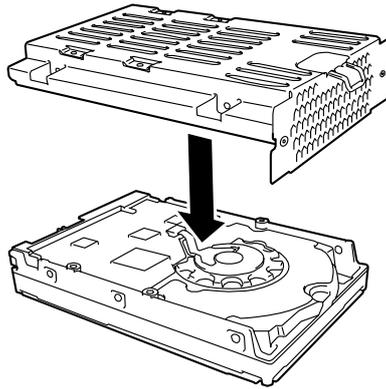


Figure 55: Assembling the hard disk drive and carrier

- Align the screw holes of the hard disk drive with those of the carrier, and secure the drive with four screws (two on the left side, two on the right side).

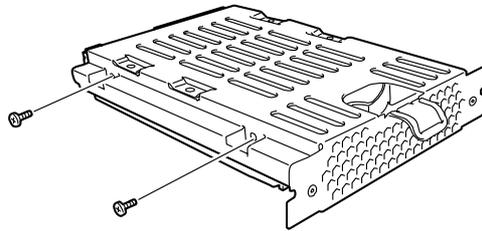


Figure 56: Securing the drive in the carrier

Caution

Use the screws provided with the hard disk drive. Using longer screws may damage the hard disk drive.

- Hold the carrier lever and insert the carrier into the slot, then secure it with two screws.

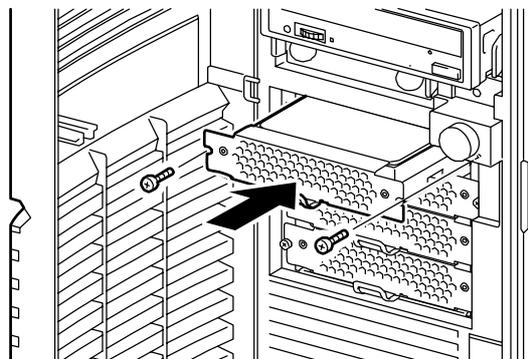


Figure 57: Inserting and securing the carrier

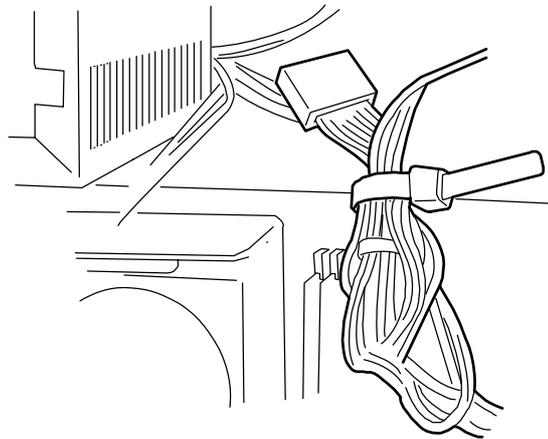
11. Connect the data and power cables to their respective hard disk drives. [See “Preparing IDE Devices” on page 147.](#)

Caution

Be careful when working around the cables connected to the already installed drives.

If necessary disconnect these cables, but be sure to note which device each cable or power lead was attached to.

 **Note:** If a cap is put on the power cable, remove it and keep it for future use. Put mating caps on the unused power connectors, and bundle the cables with a repeat tie.



12. Replace the left side door. [See “Replacing the Left Side Door” on page 101.](#)

 **Note:** Modify the BIOS Setup program to automatically recognise the hard disk drive. For additional information, refer to [“BIOS Setup Utility” on page 273.](#)

Removing a Hard Disk Drive

Caution

About data on the hard disk drive.

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

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

We strongly recommend you use specific software or enlist professional help in order to avoid any troubles. Please ask your service representative for more information.

1. Make sure the power switches for the computer, video monitor and any peripheral devices are turned OFF and unplug the power cord (see [“General Safety Information” on page 96](#)).
2. Disconnect the monitor and peripheral devices (printers, for instance) from the system.
3. Remove the left side door. See [“Removing the Left Side Door” on page 99](#).
4. Open the Front Panel.

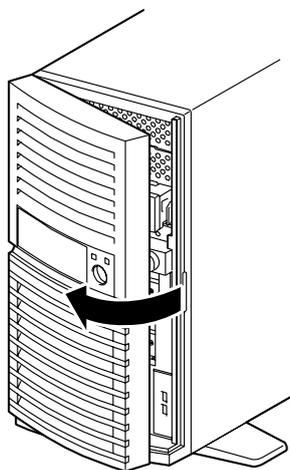


Figure 58: Opening the Front Panel

5. Locate the carrier corresponding to the hard disk drive you wish to remove.
6. Disconnect the interface and power cables from the hard disk drive.
7. Remove the two screws securing the hard disk drive carrier.

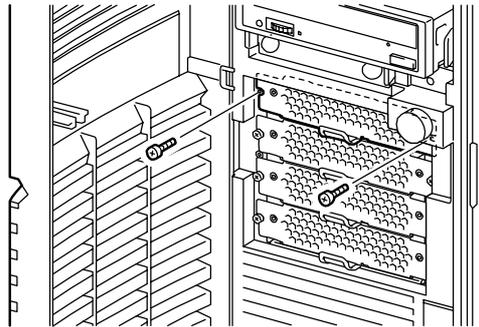


Figure 59: Removing the screws

8. Hold the hard disk drive carrier by the lever and pull it out.

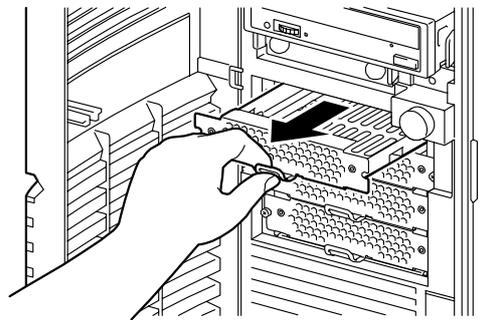


Figure 60: Pulling out the carrier

9. Remove the screws securing the hard disk drive to the carrier.

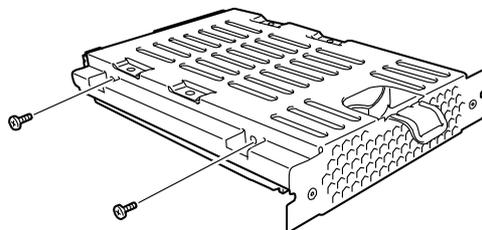


Figure 61: Removing the screws

10. Remove the hard disk drive from the carrier.
11. Hold the carrier lever and insert the carrier into the slot, then secure it with two screws.

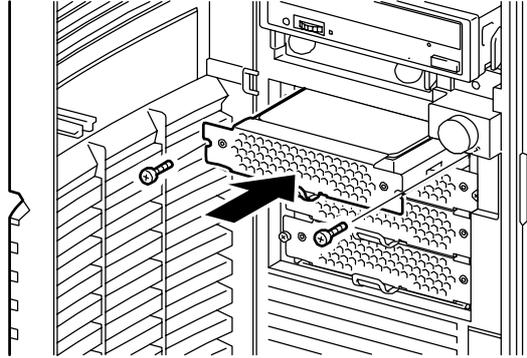


Figure 62: Inserting and securing the carrier

12. Close the front panel.
13. Replace the left side door. [See “Replacing the Left Side Door” on page 101.](#)

Installing and Removing the Additional Hard Disk Drive Cage

The additional Hard Disk Drive cage is dedicated to the server. It can contain four hot-plug hard disk drives to configure a disk array. The hard disk drives can be hot-swapped (removed or replaced without powering off the server).

Cabling examples are shown in [“Internal Cabling” on page 303](#).

Installing the Hard Disk Drive Cage

1. Make sure the power switches for the computer, video monitor and any peripheral devices are turned OFF and unplug the power cord (see [“General Safety Information” on page 96](#)).
2. Disconnect the monitor and peripheral devices (printers, for instance) from the system.
3. Remove the left side door. See [“Removing the Left Side Door” on page 99](#).
4. Open the Front Panel.

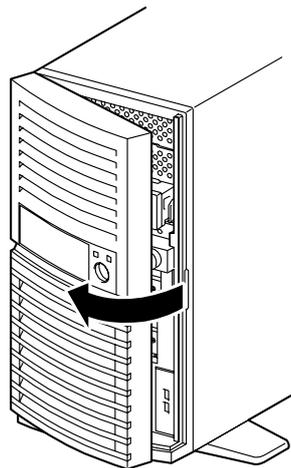


Figure 63: Opening the Front Panel

5. Disconnect the interface and power cables from the installed hard disk drives.
6. Remove the two screws securing the hard disk drive carrier.

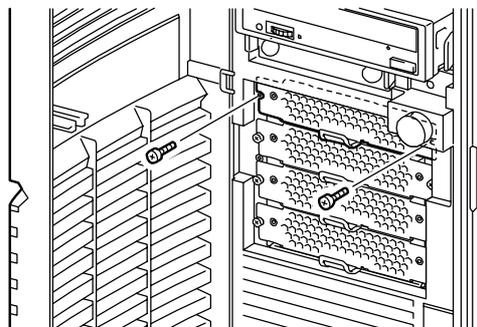


Figure 64: Removing the screws

7. Hold the hard disk drive carrier by the lever and pull it out.

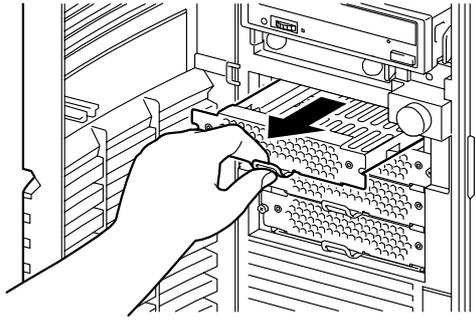


Figure 65: Pulling out the carrier

8. Repeat steps 6 and 7 to remove the 3 remaining hard disk drive carriers.
9. Hold the HDD cage and insert it slowly into the server, as shown in the figure below.

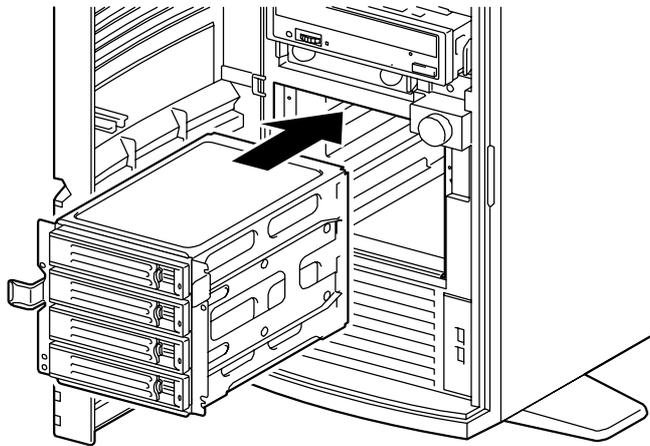


Figure 66: Inserting the hot-swap cage

10. Secure the HDD cage to the server with the four screws (from those removed in step 6).

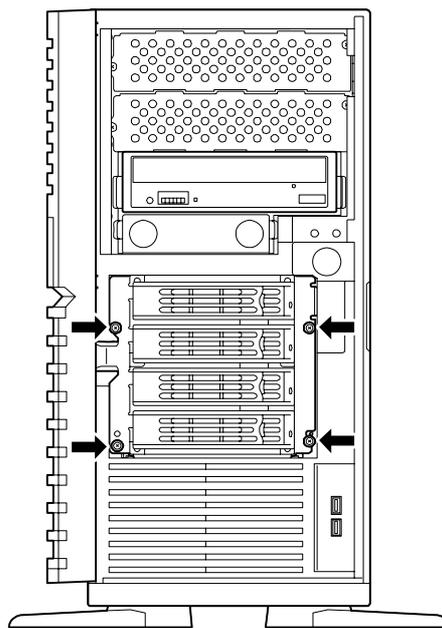


Figure 67: Securing the HDD cage

 **Note:** Keep the removed drive carriers and screws for future use.

11. Close the front panel.

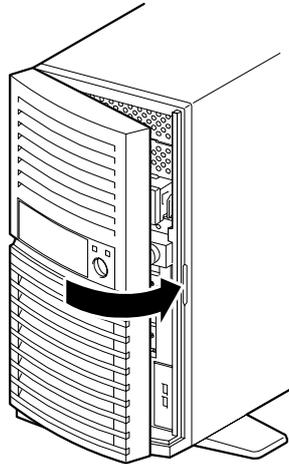


Figure 68: Closing the front panel.

12. Fold the four stabilizers at the bottom of the server.

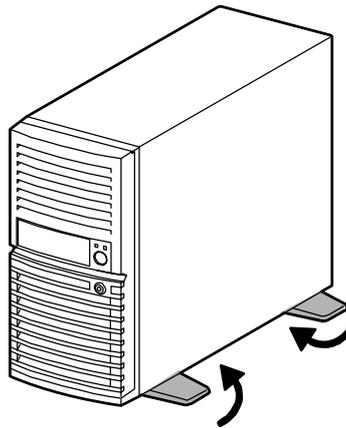


Figure 69: Folding the stabilizers

13. Lay the server on its right side.

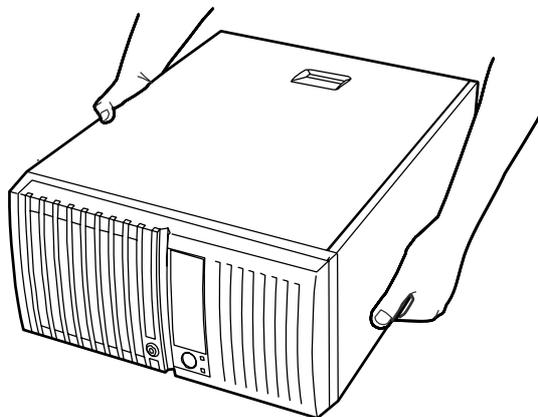


Figure 70: Laying the server on its right side

14. Make sure that the disk array controller is installed in the server. If this is not the case, install it.
15. Connect the data cable provided with the HDD cage, the I2C cable provided with the server, and the power cable provided with the disk array controller as shown in the figure below.

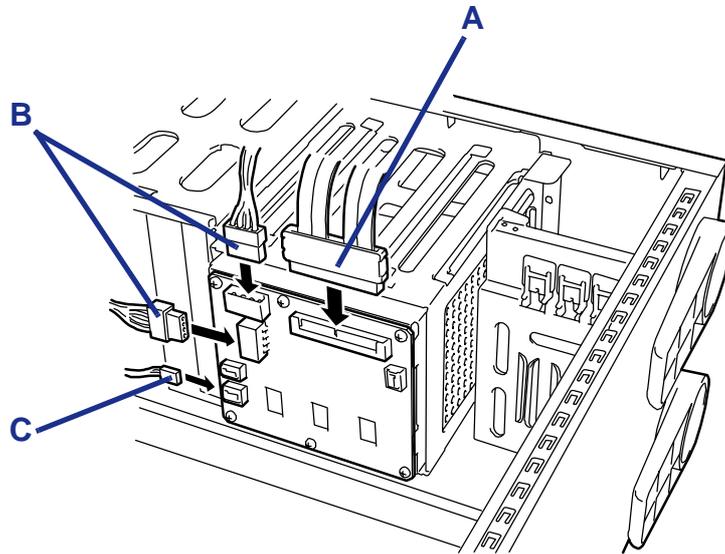


Figure 71: Connecting the HDD cage

- A: Data cable
- B: Power cable (2-pin connector)
- C: I2C cable (4-pin connector)

16. Fix the data cable as shown in the figure below.

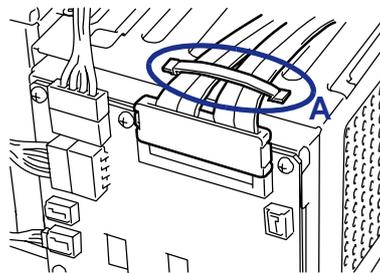


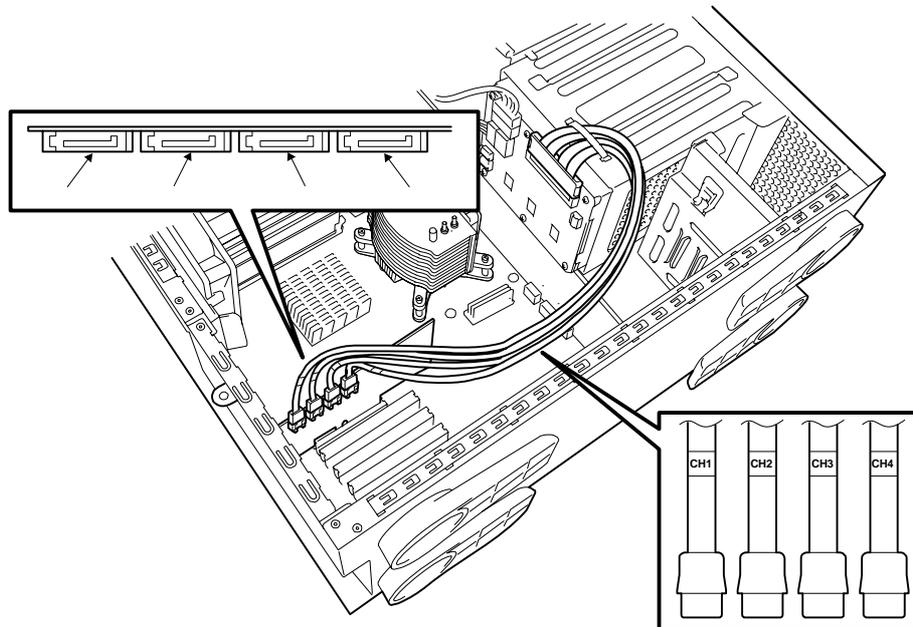
Figure 72: Fixing the data cable

- A: Cable clamp

17. Connect the data cable to the RAID board.

A label indicating the channel number of a destination port is attached to the data cable. Connect the data cable to the port (connector) having the same number as that of data cable.

 **Note:** The figure below shows an example when connecting to the SuperTrack RAID boards. The connector location and assignment of the channel numbers depend on the board. Connect both the SATA and I2C cables, refer to the manual that comes with your board for more information.



18. Replace the left side door. [See “Replacing the Left Side Door” on page 101.](#)
19. Raise the server and open the front panel.
20. Install the hot-plug hard disk drives in the HDD cage.

Fully open the lever of the hard disk drive and insert the drive into the HDD cage until it hits the depth of HDD cage.

Once the hard disk drive is fully inserted into the cage, close the lever to fix the drive. (A click occurs when it is locked.)

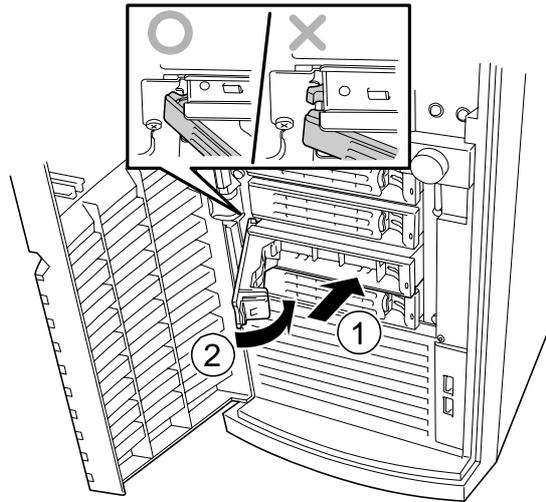
Caution

Use only hard disk drives authorized by Bull. Contact your service representative for more information.

Notes:

- *Make sure of the orientation of the hard disk drive tray before inserting the drive.*

- Make sure that the hooks of the hard disk drive are engaged with the frame of the HDD cage.



 **Notes:** The slots of the HDD cage contain trays without hard disk drive. To install the hard disk drive, first remove the tray according to the removal procedure described later. Trays, even empty, are required for effective cooling. Do not operate the server if one or several trays are missing.

21. Close the front panel.

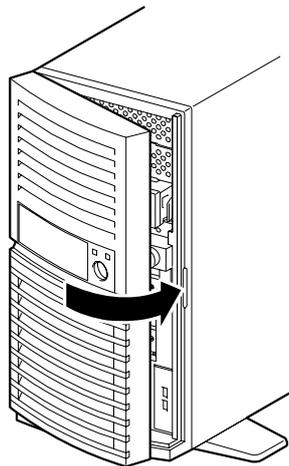


Figure 73: Closing the front panel.

Hot-Swapping a Hard Disk Drive Tray

1. Open the Front Panel.

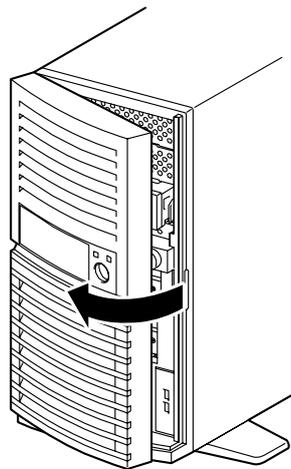


Figure 74: Opening the Front Panel

2. Push the green tab on the lever and open the lever toward you until it stops. The hard disk drive tray is unlocked.
3. Pull the tray out of the server.
4. Securely hold the replacement tray and insert the tray straight into the HDD cage.

Caution

Removing more than one hard disk drive while the server is powered on destroys the logical disk. Remove or replace the hard disk drive one by one.

5. Close the front panel.

Removing the HDD Cage

The HDD cage can be removed in the reverse order of the installation.

Upgrading Random Access Memory (RAM)

Recommended Memory Configuration

Refer to [“Specifications” on page 302](#) and to [“Memory Configuration” on page 29](#) for more information.

Installation Order and Notes

- Single channel memory configuration

Install DIMMs one by one in the ascending order of DIMM slot numbers.

- Dual channel memory configuration

To activate the dual channel mode, the following conditions must be met:

- Matched DIMM configuration in each channel.
- Same density.
- Same DRAM technology.
- Same DRAM bus width.
- All either single-sided or dual-sided.
- Matched in both channels.
- Populate symmetrical memory slots (#1 and #3, #2 and #4).

The following table lists an example of the relationship between the installation condition and the dual channel memory mode.

Table 4: Dual channel mode installation examples

| Installation | Dual channel memory mode | DIMM group | | | |
|--------------|--------------------------|---------------------------|------|-------|------|
| | | #1 | #2 | #3 | #4 |
| 1 | Active | 512MB (factory-installed) | None | 512MB | None |
| 2 | Active | 512MB (factory-installed) | 1GB | 512MB | 1GB |
| 3 | Inactive | 512MB (factory-installed) | 1GB | 512MB | None |
| 4 | Inactive | 512MB (factory-installed) | 1GB | None | 1GB |

Checking System Memory

If you do not know how much memory is installed in your system, check the amount by using the relevant following procedure.

1. On the Windows desktop, click on **Start**, and select **Control Panel**.
2. Click on **Switch to classic view**.
3. Double click on the **System** icon, and click on the **General** tab. This tab shows the random access memory (RAM). This is the amount of system memory in your computer.

Removing and Replacing a DDR2 module



Figure 75: DDR2 Memory Module Sample

If your memory configuration requires the removal of a module, perform the following steps:

1. Make sure the power switches for the computer, video monitor and any peripheral devices are turned OFF and unplug the power cord (see [“General Safety Information” on page 96](#)).
2. Disconnect the monitor and peripheral devices (printers, for instance) from the system.
3. Lay the server on its right side.
4. Remove the left side door. [See “Removing the Left Side Door” on page 99](#).
5. Remove the cooling fan.

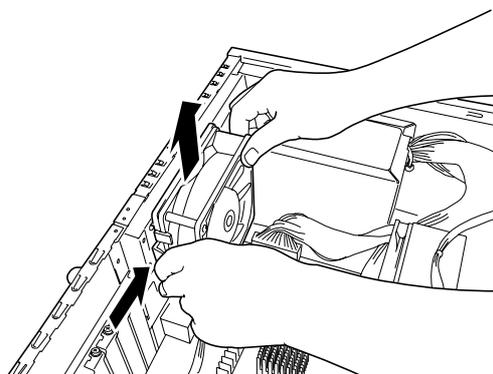


Figure 76: Removing the cooling fan

6. Locate the memory module you wish to replace.
7. Press the plastic clips at the outer edge of the socket away from the memory module. This ejects the memory module from the socket. Do not touch the

module's metal "fingers." Store the module in an anti-static bag (available at electronic supply stores) or a cardboard box.

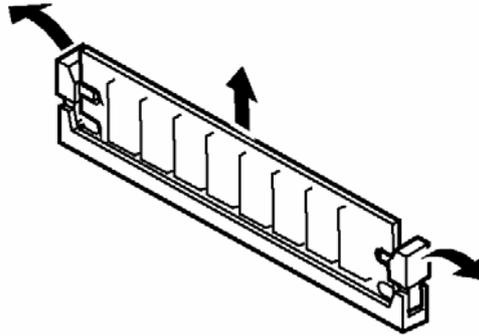


Figure 77: Removing the memory module

8. Align the new module with the 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.
9. Press the module firmly into the socket. If you have difficulty installing a module, do not force it! Carefully remove the module, then check the alignment of the module's notch with the one in the socket. Then re-install the module.
10. Make sure the locking clips at either end of the module click closed. If the brackets do not secure themselves to the module, carefully remove the module, then reinstall it.
11. Re-assemble the server.
12. Power on the server. Make sure that no error message appears in the POST. If an error message appears, write down the message and contact your service representative.

 **Note:** The amount of installed memory will be automatically detected by the system.

13. Start the BIOS Setup Utility, open the *Advanced* menu and check that under *Memory Configuration* the installed DIMM have a *Normal* status.
14. In the *Advanced* menu, also set the *Reset Configuration Data* to *Yes*. This allows the update of the hardware configuration information. Refer to [“Advanced Menu” on page 282](#) for more information.
15. When using Windows Server 2003 or Windows 2000, set the paging file size to the recommended value or a greater value. Refer to the corresponding Operating System section for more information.

Replacing the Battery

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

Replace the battery as described below:

Caution

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

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

1. Turn off and unplug the system unit and any external options connected to the system.
2. Remove the door. [See “Removing the Left Side Door” on page 99.](#)
3. Locate the battery on the motherboard. [See “Motherboard” on page 26.](#)
4. Use your finger to carefully remove the battery from the battery socket on the motherboard.

Warning

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

Use only an identically rated battery from the same manufacturer.

5. With the positive (+) side facing up, press the new battery into the socket.
6. Replace the door. [See “Replacing the Left Side Door” on page 101.](#)
7. Connect the external peripherals and the power cables.
8. Run Setup to reconfigure system parameters.

Installing and Removing an Expansion Card

Your computer's motherboard features several expansion slots that can accommodate accessory expansion cards.

Caution

- PCI boards are easily affected by static electricity. Refer to “Static Precautions” on page 97 for more information.
 - Long-sized boards (full-length board) can be installed only to the PCI slot #3. Special care must be taken to avoid damage to the components on the motherboard when installing a long-sized board.
-

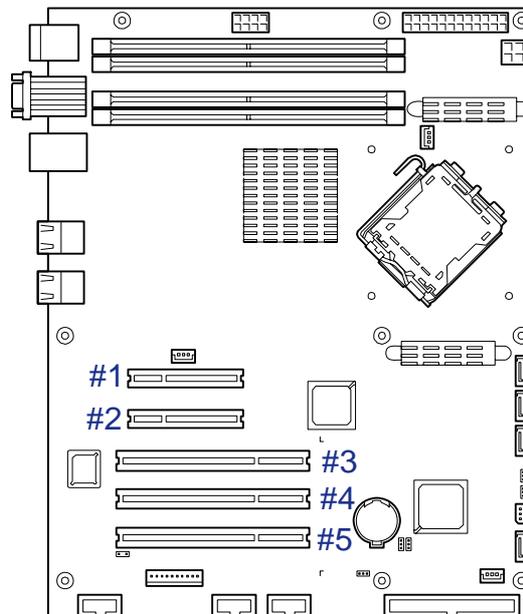


Figure 78: PCI Slots on the Motherboard

Optional Devices and Installation Slots

Figure 79: Optional Devices and Installation Slots

| Product Name | Bus A | Bus B | Bus C | | | Note |
|--|-------------|-----------|----------------|--------|--------|---|
| | PCIe #1 | PCIe #2 | PCI #3 | PCI #4 | PCI #5 | |
| PCI Slot Capability | x8 lane | x4 lane | 32bit / 33 MHz | | | |
| Slot size | Full height | | | | | |
| PCI board type | x8 socket | x8 socket | 32bit / 33 MHz | | | |
| Available board size | Short | | Long | Short | | |
| SCSI controller (64bit/66MHz PCI) | - | - | - | OK | OK | 2 max |
| SCSI controller (64bit/133MHz PCI-X) | - | - | - | OK | OK | 2 max |
| Disk array controller (SATA2) (PCI EXPRESS x8) 4 ports | OK | OK | - | - | - | 1 max |
| Disk array controller (SATA2) (PCI EXPRESS x8) 8 ports | OK | OK | - | - | - | 1 max |
| Additional battery (for the above DAC controller) | OK | OK | OK | OK | OK | |
| Disk array controller (SAS 2ch) (PCI EXPRESS x8) | OK | OK | - | - | - | 1 max |
| 100BASE-TX adapter (32bit/33MHz PCI) dual port | - | - | OK | OK | OK | 3 max (teaming included) |
| 100BASE-TX adapter (32bit/33MHz PCI) dual port | - | - | OK | OK | OK | 2 max (teaming included) |
| 1000BASE-T adapter (PCI-EXPRESS x1) | OK | OK | - | - | - | Teaming with another 1000BASE-T adapter (PCI-EXPRESS x1) is allowed. |
| 1000BASE-T adapter (2ch) (PCI-EXPRESS x4) | OK | OK | - | - | - | 2 max. 10BASE-T is not supported. |
| 1000BASE-T adapter (64bit/133MHz PCI-X) | - | - | OK | OK | - | 1 max per PCI bus (2 max per PCI bus with AFT). |
| 1000BASE-T adapter (2ch) (64bit/133MHz PCI-X) | - | - | OK | OK | - | |
| 1000BASE-SX adapter (2ch) (64bit/133MHz PCI-X) | - | - | OK | OK | - | 1 max per PCI bus (2 max per PCI bus with AFT). Cannot co-exist with: - 1000BASE-T adapter (64bit/133MHz PCI-X) - 1000BASE-T adapter (2 ch) (64bit/133MHz PCI-X) |
| Graphics accelerator (32-bit/33MHz PCI) | - | - | OK | OK | OK | 1 max. |
| Additional RS-232C connector kit | - | - | - | OK | OK | |

Specific Recommendations

RAID Controller

Take the following into consideration when installing either a Disk Array Controller. Refer to the manual that comes with the RAID controller for more details.

- Prepare the hard disk drives and cables corresponding to the RAID controller to be installed.
- Configure the Logical Settings of the hard disk drive.
- Prepare the number of hard disk drives required for the desired RAID (Redundant Array of Inexpensive [Independent] Disks) level. [See “Configuring RAID” on page 78.](#)
- Installing hard disks in the disk array configuration or changing the RAID level initializes hard disks. Make sure to backup any valuable data that may be present on the hard disk drive before installing the disk mirroring controller board and configuring the array.
- Use hard disks of the same capacity and revolution for each pack to configure them in the array.
- The disk array configuration improves the disk reliability. On the other hand, the disk capacity is reduced (not equal to the sum of the array’s hard disks total capacity).
- To indicate the access status of each hard disk drive connected to the RAID controller with the DISK ACCESS lamp on the front panel of the server, use the LED cable that comes with your server to connect the LED connectors on the motherboard and RAID controller.

 **Notes:** Be sure to use PCI slot #1 to install the PCI board for boot devices.

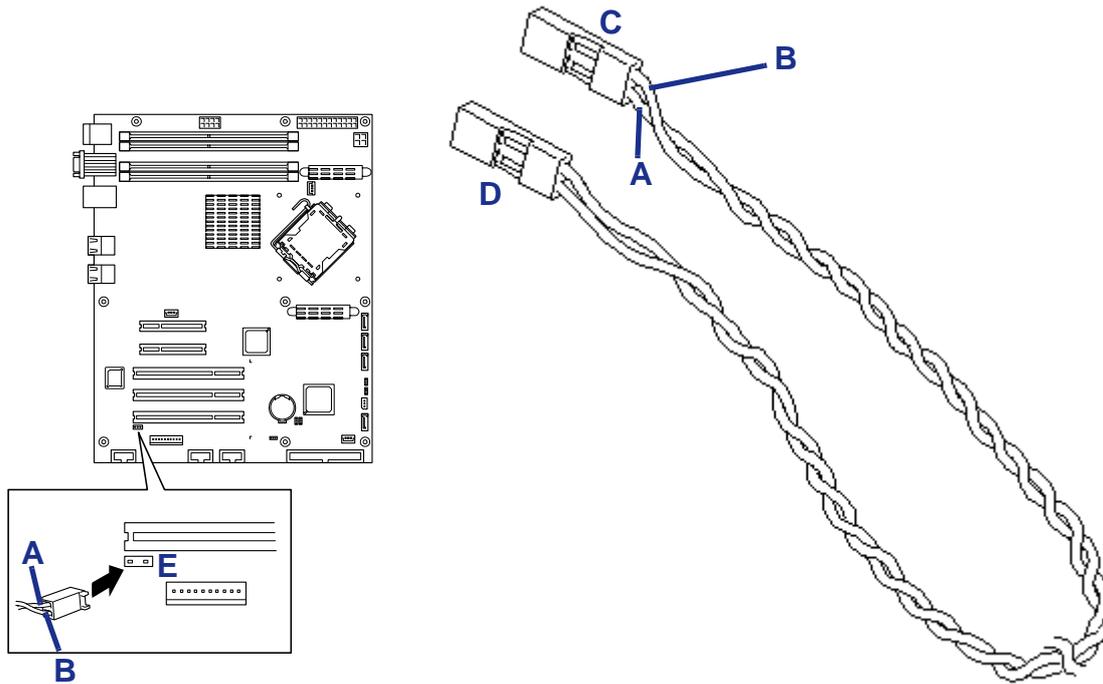


Figure 80: Connecting the LED cable

- A: Blue cable (connects to the left of the LED connector)
- B: Black cable (connects to the right of the LED connector)
- C: To the motherboard
- D: To the RAID controller (or to the additional cage backplane if it is installed)
- E: LED connector on the motherboard

Disk Array Controller (SATA2), 2 channels, 8 ports

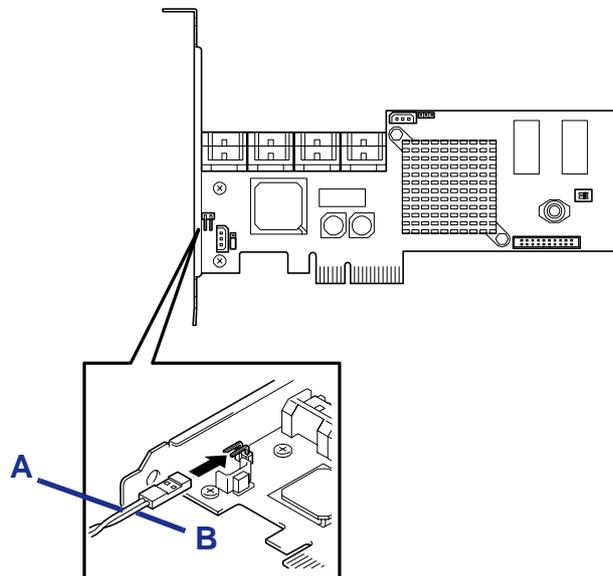


Figure 81: Connecting the controller

- A: Blue cable
- B: Black cable

 **Note:** Connect both the SATA and I2C cables, refer to the manual that comes with your board for more information.

Disk Array Controller (SATA2), 4 ports

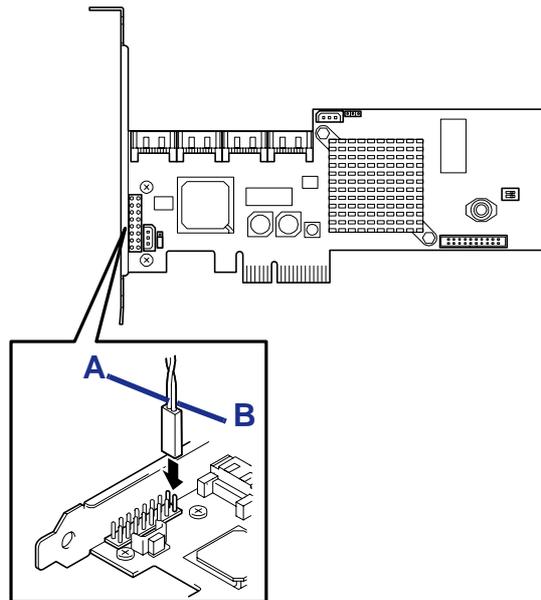


Figure 82: Connecting the controller

A: Blue cable
B: Black cable

 **Note:** Connect both the SATA and I2C cables, refer to the manual that comes with your board for more information.

Additional Serial Port Card

The following items are provided with the RS-232C connector kit.

- One RS-232C Connector Kit User Guide
- One RS-232C cable (A)
- One RS-232C cable (B)
- One PCI bracket (1)
- One PCI bracket (2)

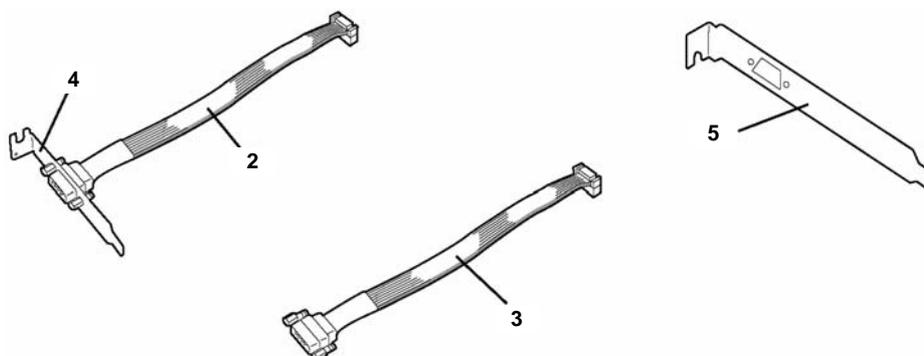


Figure 83: RS-232C connector kit

Use items 3 and 5 to install the RS-232C in the server.

Installation

1. Make sure the power switches for the computer, video monitor and any peripheral devices are turned OFF and unplug the power cord (see [“General Safety Information” on page 96](#)).
2. Disconnect the monitor and peripheral devices (printers, for instance) from the system.
3. Remove the left side door. [See “Removing the Left Side Door” on page 99](#).
4. Remove the fixing screw securing the slot cover of the slot into which you wish to install the RS-232C.
5. Remove the slot cover.

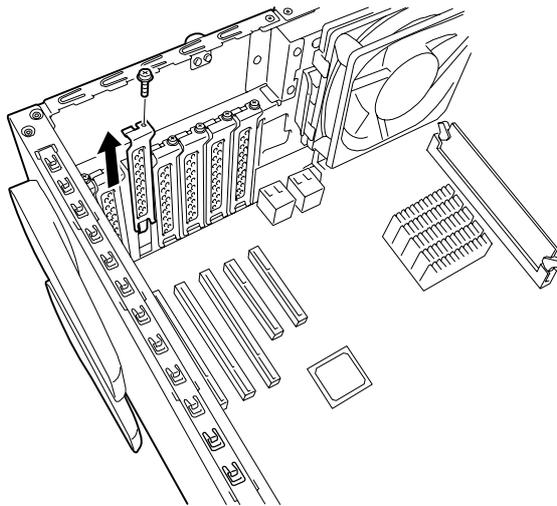


Figure 84: Removing the slot cover

 **Note:** Keep the removed slot cover for future use.

6. Insert the card into the slot, making sure that the end of the bracket is securely inserted into the frame guide.

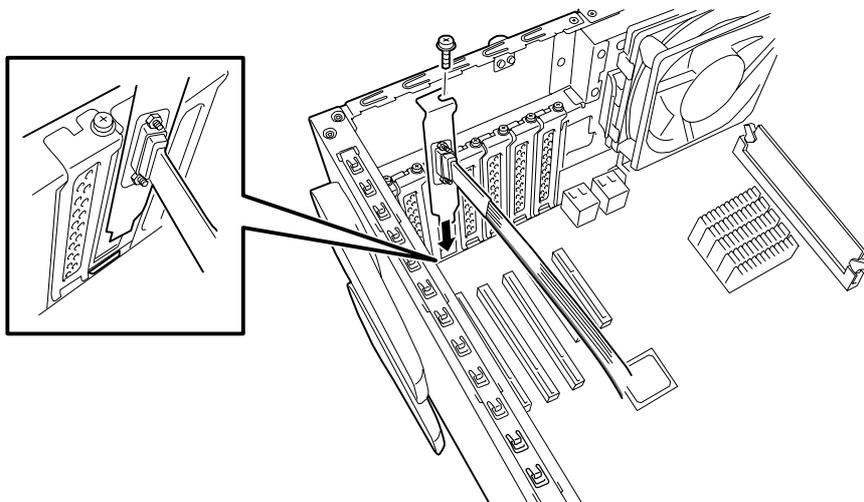


Figure 85: Inserting the card

7. Secure the card to the chassis using the screw removed previously.
8. Route the cable so that it does not interfere with other PCI boards, and plug the connector into the COM connector on the motherboard.

Pay attention to the polarity key of the connector to correctly connect the cable. The location of the COM connector is shown in the figure below.

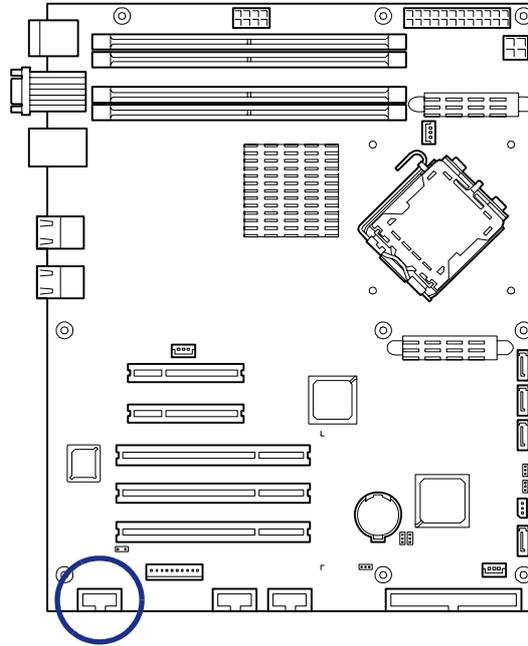


Figure 86: COM connector on the motherboard

9. Make sure that no slot cover, tool, or screws are left in the chassis, and reassemble the server.
10. Run the BIOS SETUP.
Select [Advanced] - [Peripheral Configuration] - [Serial Port B] - [Enabled].
When [Enabled] is specified, the menus [Base I/O Address] and [Interrupt] are added.
The following values are factory-set.
 - Base I/O Address: 2F8
 - Interrupt: IRQ 3

Refer to [“Advanced Menu” on page 282](#) for more information.

Installing an Expansion Card

1. Make sure the power switches for the computer, video monitor and any peripheral devices are turned OFF and unplug the power cord (see [“General Safety Information” on page 96](#)).
2. Disconnect the monitor and peripheral devices (printers, for instance) from the system.
3. Remove the left side door. [See “Removing the Left Side Door” on page 99](#).
4. Remove the fixing screw securing the slot cover of the slot into which you wish to install the expansion card.
5. Remove the slot cover.

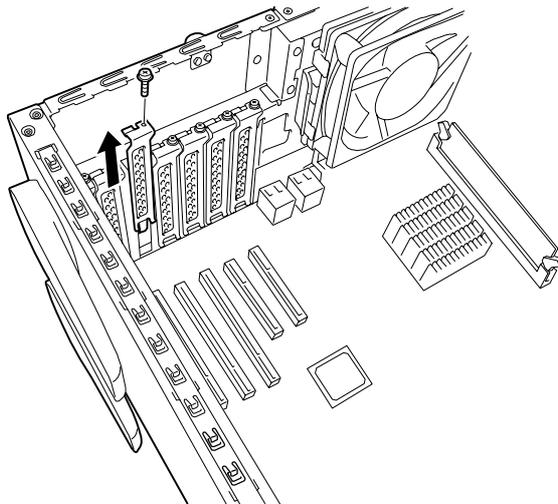


Figure 87: Removing the slot cover

 **Note:** Keep the removed slot cover for future use.

6. Remove your expansion card from its protective packaging. Do not touch the metal “fingers” on the edge of the card.
7. Check the expansion card's documentation for any switches or jumpers that may need to be set, and set them now.
8. Carefully, but firmly, press the expansion card into the connector.

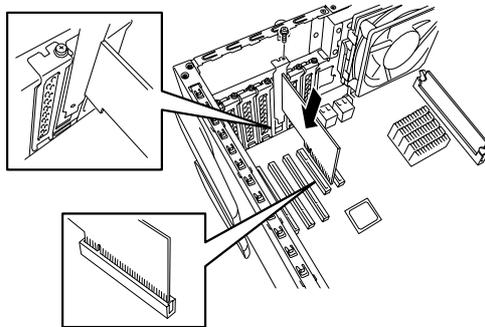


Figure 88: Inserting a card

For a long-sized board, align the board with the groove of the guide rail on the front of the server and then connect the board to the slot.

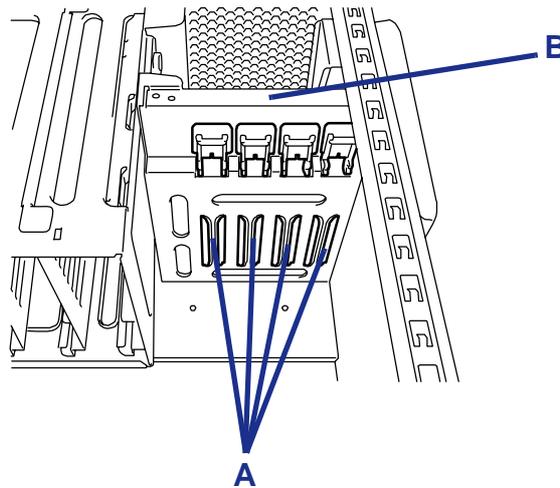


Figure 89: Inserting a long-sized card

A: Guide rail grooves
B: PCI guide rail

Caution

Forcing the card into the connector will damage the card.
If it does not insert well, remove it completely from the slot and try again.

9. Connect any required cables, if any.
10. Re-assemble the server.
11. Power on the server. Make sure that no error message appears in the POST.
If an error message appears, write down the message and contact your service representative.
12. Start the BIOS Setup Utility, open the *Advanced* menu and set the *Reset Configuration Data* to *Yes*.
This allows the update of the hardware configuration information. Refer to [“Advanced Menu” on page 282](#) for more information.

Additional Settings

Depending on the type of the installed card, some server settings must be modified by using the proper utility (such as the BIOS Setup Utility or the setup utility installed in the card) after the installation.

Provide the settings correctly according to the information described in the manual provided with the card.

The server scans the PCI bus numbers in ascending order after the power-on. If the BIOS utility is stored in the optional ROM mounted on the card, the PCI bus start messages (banners) appear in the ascending order of the PCI bus numbers.

Removing an Expansion Card

1. Make sure the power switches for the computer, video monitor and any peripheral devices are turned OFF and unplug the power cord (see [“General Safety Information” on page 96](#)).
2. Disconnect the monitor and peripheral devices (printers, for instance) from the system.
3. Remove the left side door. [See “Removing the Left Side Door” on page 99](#).
4. Remove the fixing screw securing the expansion card you wish to remove.
5. If applicable, disconnect any cables connecting the card to the motherboard.
6. Do not touch any components on the card - handle it only by its edges, to avoid risk of damage from electrostatic discharge. Without flexing the motherboard, carefully unplug the card from its connector on the motherboard, and remove it from the expansion slot on the chassis' rear panel.
7. Store the expansion card in an anti-static bag (available from electronic supply stores) or a cardboard box.
8. Place an expansion slot cover in the space left by the expansion card you removed, and secure the screw removed previously.
9. Re-assemble the server.
10. Power on the server. Make sure that no error message appears in the POST.
If an error message appears, write down the message and contact your service representative.
11. Start the BIOS Setup Utility, open the *Advanced* menu and set the *Reset Configuration Data* to *Yes*.
This allows the update of the hardware configuration information. Refer to [“Advanced Menu” on page 282](#) for more information.

Cabling IDE Devices

The IDE Cable

The following figure shows a typical three-connector IDE cable. If the IDE cable is not keyed with a connector tab, align the coloured edge (Pin 1) of the cable with the pin 1 side of the drive connector.

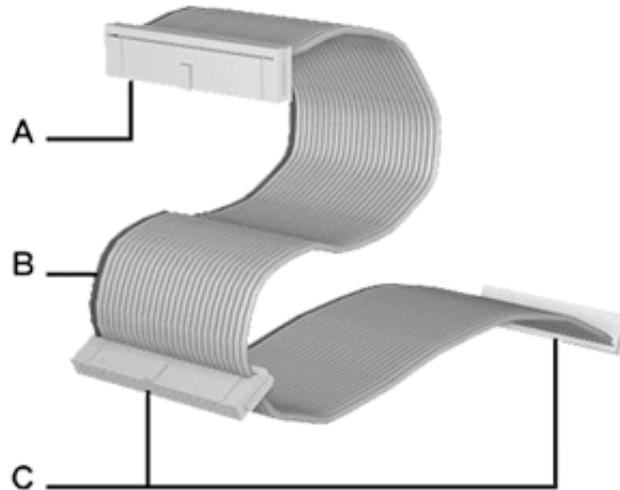


Figure 90: Three-connector IDE Cable

- A - Connects to the motherboard IDE port
- B - Red edge (Pin 1)
- C - Connects to IDE devices

System Power Cables

Power cables come from the power supply and are attached to standard storage devices. System power cables vary in length and provide connector sizes to accommodate a variety of supported storage configurations. Power cable connectors are keyed to fit only in the correct position.



Figure 91: IDE Storage Device Power Cable Connector

Cabling an Optical Disc Drive

All optical devices require power and IDE cable connections. Devices shipped with the system are already connected.

The following procedure explains how to attach the cables to an optical drive.

1. Connect the IDE cable connector (B) to the matching pins on the storage device.
 - Take care to prevent bending drive connector pins.
 - Align the cable connector to the matching pins on the drive.
2. Locate an available power connector coming from the power supply.

3. Connect the appropriate power cable (D) to the power connector on the storage device.

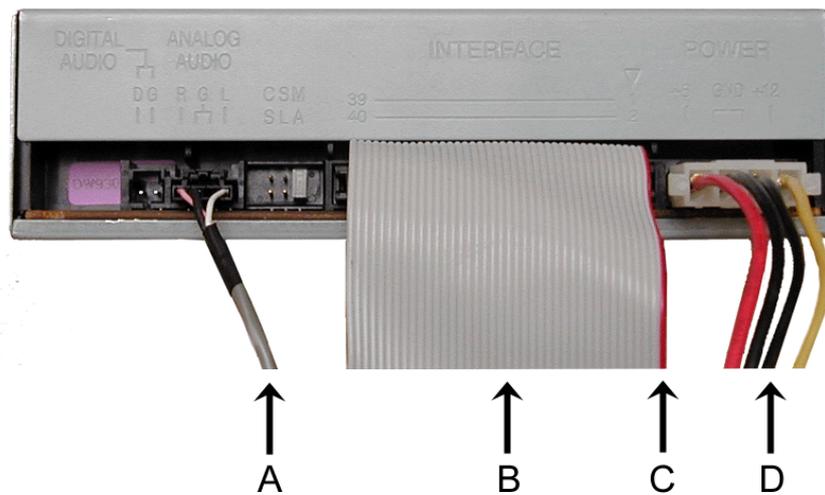


Figure 92: Cabling an IDE Optical Device

- A - Audio Cable - N/A
- B - IDE cable
- C - Red edge (Pin 1)
- D - Power cable

 **Note:** Audio Cable is not available on this system.

Cabling SCSI Devices

Cabling a SCSI Hard Disk Drive

All storage devices require power and DATA cable connections. Devices shipped with the system are already connected.

The following procedures explain how to attach the cables to a hard disk drive.

SCSI Hard Disk Drive

All storage devices require power and SCSI cable connections. Devices shipped with the system are already connected.

The following procedure explains how to attach the cables to a hard disk drive.

1. Connect one of the relevant SCSI cable connectors (A) to the matching pins on the storage device.
 - Take care to prevent bending drive connector pins.
 - Align the cable connector to the matching pins on the drive.
2. Locate an available power connector coming from the power supply.
3. Connect the appropriate power cable (B) to the power connector on the storage device.

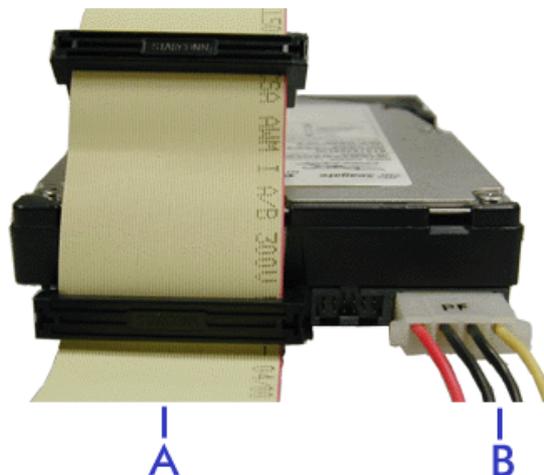


Figure 93: Cabling a SCSI Hard Disk Drive

A - SCSI cable
B - Power cable

Cabling SATA Devices

The S-ATA Cable

Your system comes equipped with two S-ATA cables.

Both connectors go either to a hard disk drive or to the motherboard.



Figure 94: S-ATA Cable

 **Note:** The color of the S-ATA cable may differ from the color of the cable shown in the picture.

System Power Cables

Power cables come from the power supply and are attached to standard storage devices. System power cables vary in length and provide connector sizes to accommodate a variety of supported storage configurations. Power cable connectors are keyed to fit only in the correct position.



Figure 95: S-ATA Storage Device Power Cable Adaptor

Cabling a Hard Disk Drive

All storage devices require power and DATA cable connections. Devices shipped with the system are already connected.

The following procedures explain how to attach the cables to a hard disk drive.

S-ATA Hard Disk Drive

1. Connect the S-ATA cable connector to the matching pins on the storage device.
 - Take care to prevent bending drive connector pins.
 - Align the cable connector to the matching pins on the drive. Black side goes to hard disk drive; blue side goes to motherboard. Refer to S-ATA Hard Disk Drive picture hereafter.

2. Locate an available power connector coming from the power supply.
3. Connect the appropriate power cable to the cable power adaptor.
4. Connect the power cable adaptor to the connector on the storage device.

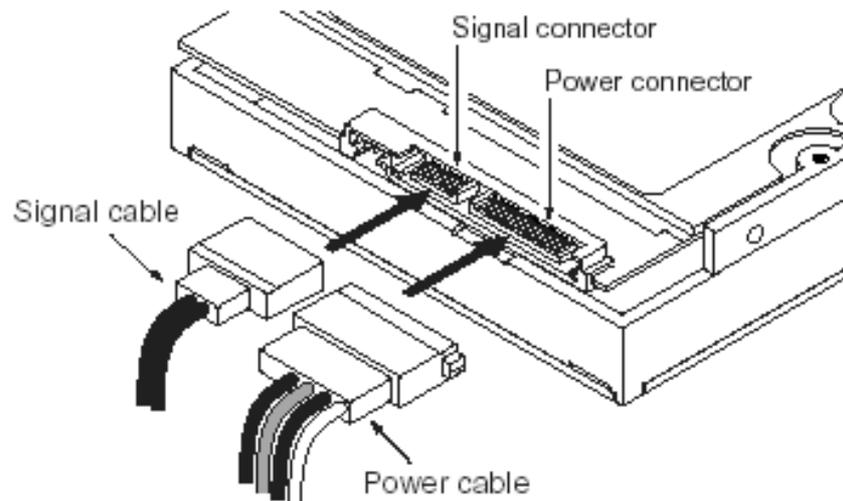


Figure 96: S-ATA Hard Disk Drive

Cabling a Floppy Disk Drive

All storage devices require power and data cable connections. Devices shipped with the system are already connected.

The following procedure explains how to attach the cables to a floppy disk drive.

1. Connect the data cable connector (A) to the matching pins on the storage device.
 - Take care to prevent bending drive connector pins.
 - Align the cable connector to the matching pins on the drive.
2. Locate an available power connector coming from the power supply.
3. Connect the appropriate power cable (C) to the power connector on the storage device.

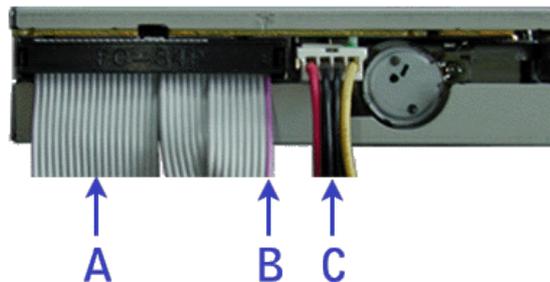


Figure 97: Cabling a Floppy Disk Drive

A - Data cable
B - Purple edge (Pin 1)
C - Power cable

Cabling SAS Devices

The SAS Cable

Your system comes equipped with one of the following SAS cables, depending on the hard disk drives controller you have selected.

Refer to the instructions included in the *Installing Hard Disk Drives* or *Hard Disk Drives Cage* chapters (depending on your configuration) for more information on the motherboard to backplane connection.

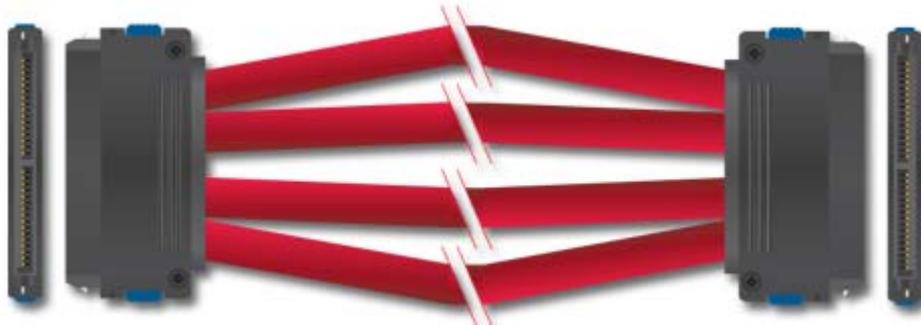


Figure 98: SAS Cable (1 to 1)

Connect one end of the cable to the motherboard SAS connector, and the other end to the hard disk drives cage backplane.

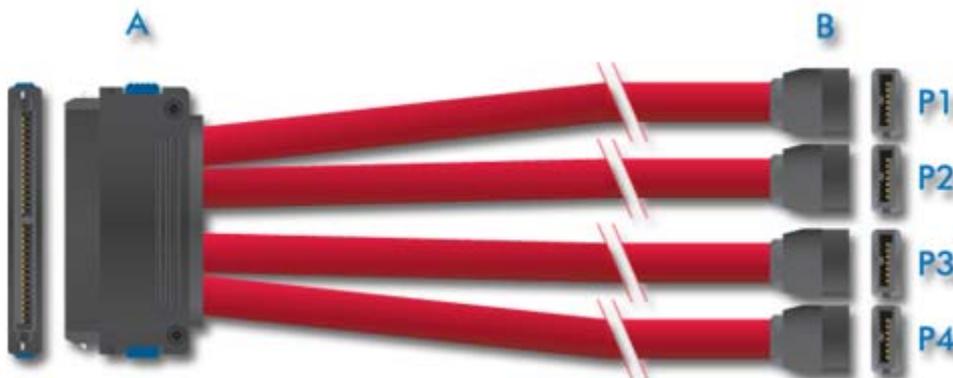


Figure 99: SAS Cable (1 to 4)

A: Backplane connector

B: Motherboard connectors (numbered P1 through P4)

 **Note:** The color of the SAS cable may differ from the color of the cable shown in the picture.

Preparing IDE Devices

 **Note:** Please note that in normal operation mode, the 'cable select' position is recommended for all IDE devices.

Preparing an IDE Optical Drive

Before installing a CD/DVD-ROM drive in the system, the jumper on the back of the drive must be set as "cable select".

Refer to the "Jumper settings (example)" hereafter for details about configuring IDE drives as master or slave.

Refer to the instructions printed on the device for further jumper setting information.

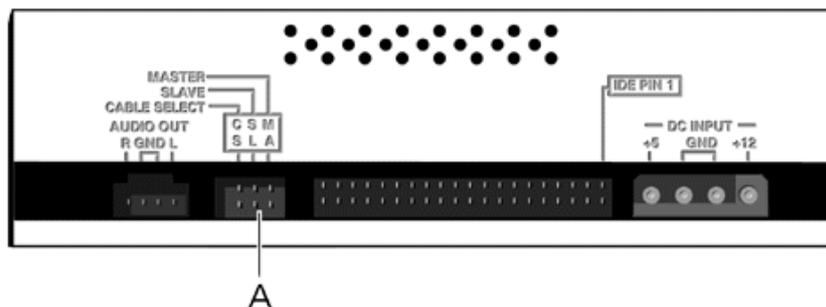


Figure 100: Connectors on the Back of an Optical Drive (example)

A - Jumper block

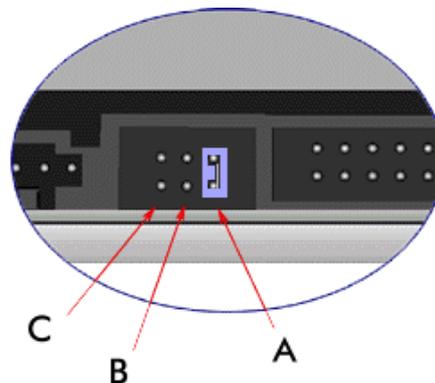


Figure 101: Jumper settings (example)

A - Master
 B - Slave
 C - Cable select

Caution

Always connect IDE optical drives to the secondary IDE connector.

Preparing an IDE Tape Drive

Before installing a tape drive in the system, it should be set as a master or a slave device using the drive select jumper at the back of the drive.

Refer to the “Connectors on the Back of a Tape Drive (example)” hereafter for details about configuring IDE drives as master or slave.

Refer to the instructions printed on the device for further jumper setting information.

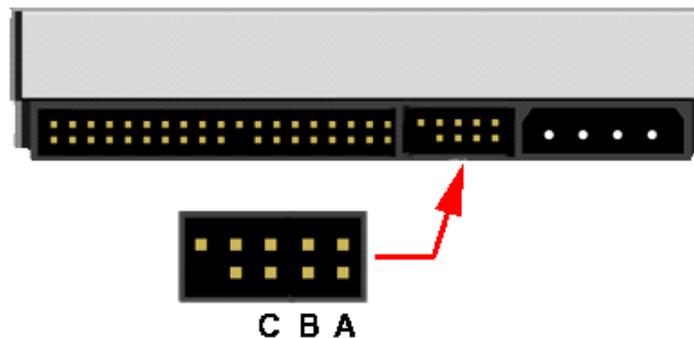


Figure 102: Connectors on the Back of a Tape Drive (example)

- A - Master Setting
- B - Slave Setting
- C - Cable Select

Caution

Always connect IDE tape drives to the primary IDE connector. IDE tape drives must not be connected to a data cable on which an optical disc drive is also connected.

Preparing SCSI Devices

Preparing a SCSI Hard Disk Drive

Before installing a SCSI hard disk drive in the system, it should be set as ID0, ID1, ID2 or ID3.

Refer to the instructions printed on the device for further jumper setting information.

Preparing a SCSI Tape Drive

Before installing a SCSI tape drive in the system, it should be set as ID4.

Refer to the instructions printed on the device for further jumper setting information.

Preparing SATA Devices

Preparing a S-ATA Hard Disk Drive

S-ATA hard disk drives do not need to be prepared.

Interrupt Requests

The factory-set interrupt requests (IRQs) are listed below. Find an appropriate one to install an optional device.

Table 5: Interrupt Requests

| IRQ | Peripheral Device (Controller) |
|-----|--------------------------------|
| 0 | System Timer |
| 1 | - |
| 2 | - |
| 3 | COM B |
| 4 | COM A |
| 5 | PCI |
| 6 | - |
| 7 | PCI |
| 8 | Real-time clock |
| 9 | API-Compliant System |
| 10 | PCI |
| 11 | BMC IRQ |
| 12 | - |
| 13 | Numeric processor |
| 14 | Primary IDE |
| 15 | Secondary IDE |
| 16 | LAN1 |
| 17 | LAN2 |
| 18 | - |
| 19 | VGA |
| 20 | USB2 |
| 21 | USB |
| 22 | USB |
| 23 | USB |

Installing and Using Utilities

Please setup the server using the ExpressBuilder disc 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.
- Create a support disk; this disk will be used to manually install a Microsoft operating system.
- Install utilities, such as management software for Windows (NEC ESMPRO etc.). Windows-based applications are installed via the Master Control menu.

 **Note:** Some of the utilities mentioned above may not be available on your server.

- Read the on-line documentation (Windows systems only).

 **Note:** Some of the 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 disc sleeve.

Utilities

All the utilities described in the pages hereafter are not available on your server system. Most depend on your configuration.

For instance, amid the several RAID configuration and management utilities listed, only the ones relevant to your RAID hardware (card or chipset) will be available.

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 two distinct programs:

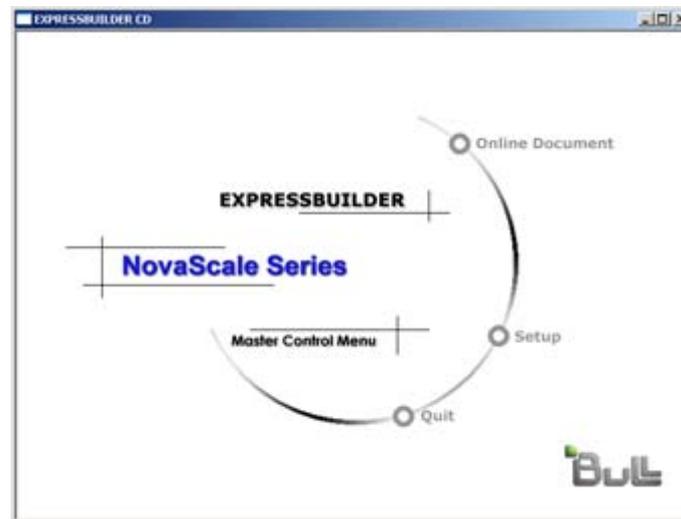
- DOS-based with local console

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.



■ 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 describes how to start ExpressBuilder.

Caution

Do not remove the ExpressBuilder disc while ExpressBuilder is running.

1. Turn on first the peripheral devices and then the server.

2. Insert the ExpressBuilder disc supplied with your server into the DVD-ROM drive of your server.
3. Ensure that the floppy disk drive is empty (if applicable).
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

"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, after a few tasks are completed, all that remains to be done is to remove the ExpressBuilder disc, insert the Windows disc, 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

"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 6: Tools Menu

| Tools Menu | |
|--------------------------------------|-------------------------------|
| Save/Restore RAID Configuration Data | RAID Board: None |
| Off-line Maintenance Utility | Server Management Board: None |
| System Diagnostics | System Configuration: None |
| Create Support Disk | |
| 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 disc 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 disc. 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 disc.

- 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 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 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 a direct connection (COM B)

For the procedure used to start ExpressBuilder for DOS-based with Remote Console, refer to [“NEC DianaScope” on page 166](#).

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 a 3.5-inch floppy disk. Please have the floppy disk ready.
-

 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

Top menu items are listed below:

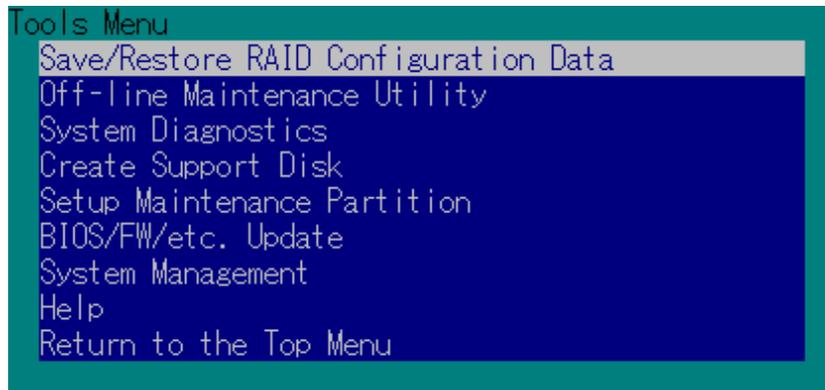
- Setup: automatically sets up the server.
- Tools: launch the features of ExpressBuilder individually.
- Help: help message on ExpressBuilder.
- Quit: quit ExpressBuilder.

Setup

ExpressBuilder checks the hardware configuration of the server. The disk array and maintenance partition are automatically configured.

Tools

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.
-

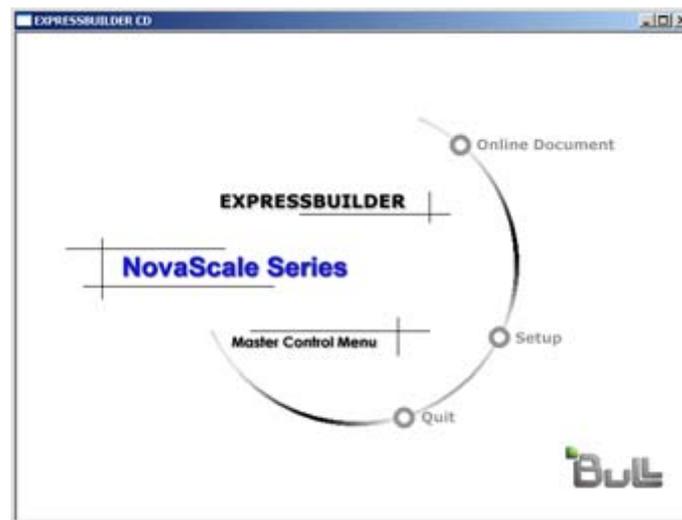
ExpressBuilder for Windows-Based (Master Control Menu)

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 disc 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 disc 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. Refer to "[Installing the Operating System with Express Setup](#)" on page 175 for more information.

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 and Microsoft Windows 2000.

 *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 disc 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.

Caution

For installation procedure and detailed explanations on NEC ESMPRO, refer to the online documentation provided on the ExpressBuilder disc.

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 a 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, 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.

ExpressScope

The ExpressScope Engine enables you:

- to monitor the operating status of the host system (power supplies, fans, temperature and so forth),
- to operate the host system's keyboard, video, and mouse (KVM) from a remote console, and
- to access to the optical disc/Floppy disk drives on a remote site.

 **Note:** *The Remote KVM and Remote Media functions are optional.*

The host system comes standard with the BMC (system management LSI) and a management LAN port dedicated to the BMC. By connecting the management LAN port to your network, you can monitor and control the host system from a remote site via a Web browser and Telnet/SSH client.

With the optional Remote KVM and Media License, you can operate the host system's KVM (keyboard, video, and mouse) from a remote console and access optical disc/floppy disk drives in a remote site.

 **Note:** *Contact your service representative for more information on this optional license.*

Refer to the ExpressScope Engine User Guide on the ExpressBuilder disc for more information.

WebPAM

The Web-Based Promise Array Management (WebPAM) software offers local and remote management and monitoring of all FastTrak/SuperTrack logical drives that exist anywhere on a network. The browser-based graphical user interface provides email notification of all major events/alarms, memory cache management, drive event logging, logical drive maintenance, rebuild, and access to all components in the RAID configuration (server, controller, logical drives, physical drives, and enclosure).

For more information on using WebPAM, refer to the WebPAM Online Help.

SCSISelect Utility

The *SCSISelect* Utility detects and configures the SCSI controller located on the system board or an optional SCSI controller board installed in your system. This utility may be started with a simple key operation while POST is in progress and requires no specific start-up disk.

The *SCSISelect* Utility is used mainly to set the transfer rate of connected SCSI device. Use the *SCSISelect* Utility to:

- Change default values
- Check and/or change SCSI device settings that may conflict with those of other devices in the system.

Running the SCSISelect Utility

You access the *SCSISelect* Utility when you turn on or reboot your system.

To run the utility, perform the following procedure:

1. Power-on or reboot the system.
2. When the “*Press Ctrl-A to run SCSI Utility...*” message appears, press **Ctrl+A**. The SCSI utility starts. When the Adaptec SCSI Utility detects more than one host adapters, it displays a selection menu listing the slot number of each adapter. Select the adapter you wish to configure.
3. The following screen is displayed:

Table 7: SCSISelect Utility Selection Menu

| Menu | Description |
|------------------------------------|--|
| Configure/View Controller Settings | Configure host adapter and device settings. |
| SCSI Disk Utilities | The utility scans the SCSI bus for SCSI devices, reports a description of each device. Run these utilities <i>before</i> configuring SCSI devices. |

4. If you wish to format a disk, verify disk media, or display a list of devices and their SCSI IDs, select **SCSI Disk Utilities**.

If you wish to configure the adapter or a device, select **Configure/View Controller Settings**.

Adaptec SCSI Utility Configuration Settings

The following keys are active for all Adaptec SCSI Utility screens:

Table 8: Active Keys

| Key | Action |
|--------|---|
| Arrows | Up and down arrows move from one parameter to another within a screen. |
| ENTER | Displays options for a configurable parameter. Selects an option. |
| ESC | Moves back to previous screen or parameter or EXIT if at the Main menu. |
| F5 | Switches between color and monochrome. |
| F6 | Resets to host adapter defaults. |

The following table shows the normal settings for the Adaptec SCSI Utility and provides a place for you to record any changes you make to these settings.

Table 9: SCSISelect Utility Setup Configurations

| OPTION | RECOMMENDED SETTING OR DISPLAY ONLY | YOUR CONFIGURATION |
|--|-------------------------------------|--------------------|
| SCSI Bus Interface Definitions | | |
| SCSI Controller ID | 7 | |
| SCSI Controller Parity | Enabled | |
| SCSI Controller Termination | Enabled | |
| Additional Options | | |
| Boot Device Configuration | Press ENTER for menu | |
| Master SCSI Controller | 29320ALP slot 01 03:01:00 | |
| Boot SCSI Controller | 29320ALP slot 01 03:01:00 | |
| SCSI Device Configuration | Press ENTER for menu | |
| Sync Transfer Rate (MB/Sec) | 320 | |
| Packetized | Yes | |
| QAS | Yes | |
| Initiate Wide Negotiation | Yes | |
| Enable Disconnection | Yes | |
| Send Start Unit Command | Yes | |
| BIOS Multiple LUN Support | No ¹ | |
| Include in BIOS Scan | Yes ¹ | |
| Advanced Configuration | Press ENTER for menu. | |
| Reset SCSI Bus at IC Initialization | Enabled | |
| Display <Ctrl-A> Messages During BIOS Initialization | Enabled | |
| Extended Int13 Translation for DOS Drives >1 GByte | Enabled | |
| POST Display Mode | Verbose | |
| SCSI Controller Int13 Support | Enabled ¹ | |
| Domain Validation | Enabled ¹ | |
| Support Removable Disks Under Int13 as Fixed Disks | Disabled ^{1, 2} | |
| BIOS Support for Bootable CDROM | Enabled ¹ | |

¹ No effect if BIOS is disabled.

² Do not remove media from a removable media drive if it is under BIOS control.

SCSI Disk Utilities

This utility scans the SCSI bus for SCSI devices, and reports a description of each device. Run this utility before configuring SCSI devices.

To enter the utility, select **SCSI Disk Utilities** on the *Options* menu.

The SCSI ID scan begins displaying the message as shown below.

Scanning SCSI ID : 0 LUN Number : 0

When the SCSI ID scan completes, the screen listing SCSI IDs and associated devices appears.

Select SCSI Disk and press <Enter>

```

SCSI ID #0 : No device
SCSI ID #1 : No device
SCSI ID #2 : No device
SCSI ID #3 : No device
SCSI ID #4 : No device
SCSI ID #5 : No device
SCSI ID #6 : No device
SCSI ID #7 : Adaptec 29320ALP
SCSI ID #8 : No device
SCSI ID #9 : No device
SCSI ID #10 : No device
SCSI ID #11 : No device
SCSI ID #12 : No device
SCSI ID #13 : No device
SCSI ID #14 : No device
SCSI ID #15 : No device
    
```

With this screen you can determine the SCSI IDs of the installed options. You can also view the device information by selecting a device and pressing **Enter**.

The following submenu appears.

```

SCSI ID#4: xxxxxxxxxx
Firmware: xxxx xxx
Capacity: xxGB

Format
Verify Disk Me-
dia
    
```

The following table lists submenu items and descriptions.:

Table 10: Submenu Items

| Submenu item | Description |
|-------------------|--|
| Format | Formats the selected device. |
| Verify Disk Media | Verifies all the sectors in the selected device. If one or more bad sectors are found, the sectors are remapped. |

Exiting Adaptec SCSI Utility

To exit the Adaptec SCSI Utility, press ESC until a message prompts you to exit (if you changed any settings, you are prompted to save the changes before you exit).

System Diagnostics

The System Diagnostics tool runs several tests on the system.

Use the System Diagnostics program in the ExpressBuilder disc provided with the system to diagnose the system.

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.

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

 **Note:** No data is written to the hard disk during the disk check.

Starting and Ending the System Diagnostics

There are two ways to diagnose the system: to use the local console (keyboard) of the system 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 system. Then, unplug the power cord.
2. Disconnect all the LAN cables from the system.
3. Plug the power cord and turn on the system.
4. Reboot the system with the ExpressBuilder disc.
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 above.
 - <Device List> shows the information of all the devices connected.
 - <Log Info> shows the log information and error messages of the diagnosis. it can be saved to a floppy disk. To save the log information to a floppy disk, insert a formatted floppy disk to a floppy disk drive and select <Save [F]>.
 - <Option> change where to output log
 - <Reboot> Restarts the system.
8. Select <Reboot> in the End User Menu above.
The BULL NovaScale system restarts and ExpressBuilder boot the system.
9. Exit ExpressBuilder, and remove the disc from the optical device drive.
10. Turn off the system and unplug the power cord from the receptacle.
11. Reconnect all the LAN cables to the system.
12. Plug the power cord.

This completes the System Diagnostics.

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 Standard 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 273.](#)

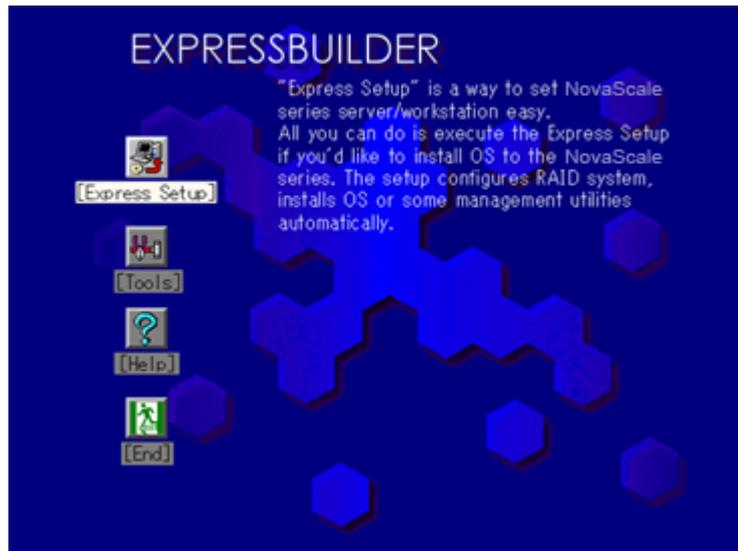
About Express Setup

"Express Setup" helps you install the Windows Operating System.

The setup automatically configures the RAID system and installs the Operating System and some management software.

Caution

Executing Express Setup erases the contents of the hard disk.



You can also use "Configuration Disk" 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.*
-

Microsoft Windows Server 2003

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

Caution

When using Windows Server 2003 with this equipment, it is mandatory to apply the ServicePack 1.

 **Note:** Express Setup does not support the installation of Windows Server x64 Editions. See [“Installing Microsoft Windows Server 2003 x64 Editions” on page 215](#) for more information.

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

If you wish to install another operating system, contact your sales dealer or the maintenance service representative.

BIOS Settings

Before installing Windows Server 2003, check that the BIOS settings are correct.

NEC ESM PRO Agent

The NEC ESM PRO Agent requires the necras.sys driver on your Windows system. If you install Windows without using the Express Setup, run the Update BULL NovaScale system in the Master Control Menu.

Windows Server 2003

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

Caution

- Complete all the hardware settings (BIOS and optional board settings) before starting the installation.
 - Once the Express Setup is completed, refer to ["Setting for Solving Problems" on page 192](#).
-

Installing on the Mirrored Volume

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".

Connecting a Magneto-Optical Device

Connect the magneto-optical device after the operating system has been successfully installed.

Connecting Medias such as DATs

Connect any drives that are not mandatory after the operating system has been successfully installed.

Connecting Hard Disk Drive

Connect additional hard disks after the operating system has been successfully installed.

Creating 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 + 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 × 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.)

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

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

If you want to keep the current partition, refer to [“Installing Microsoft Windows Server 2003” on page 200](#) in order to re-install the system.

About the Maintenance Partition (area displayed as “MAINT P”)

The maintenance partition (used for server maintenance) is reserved in the head of Hard Disk Drive (size of approximately 55MB).

This area is used for saving some maintenance utilities.

Do not delete the maintenance partition.

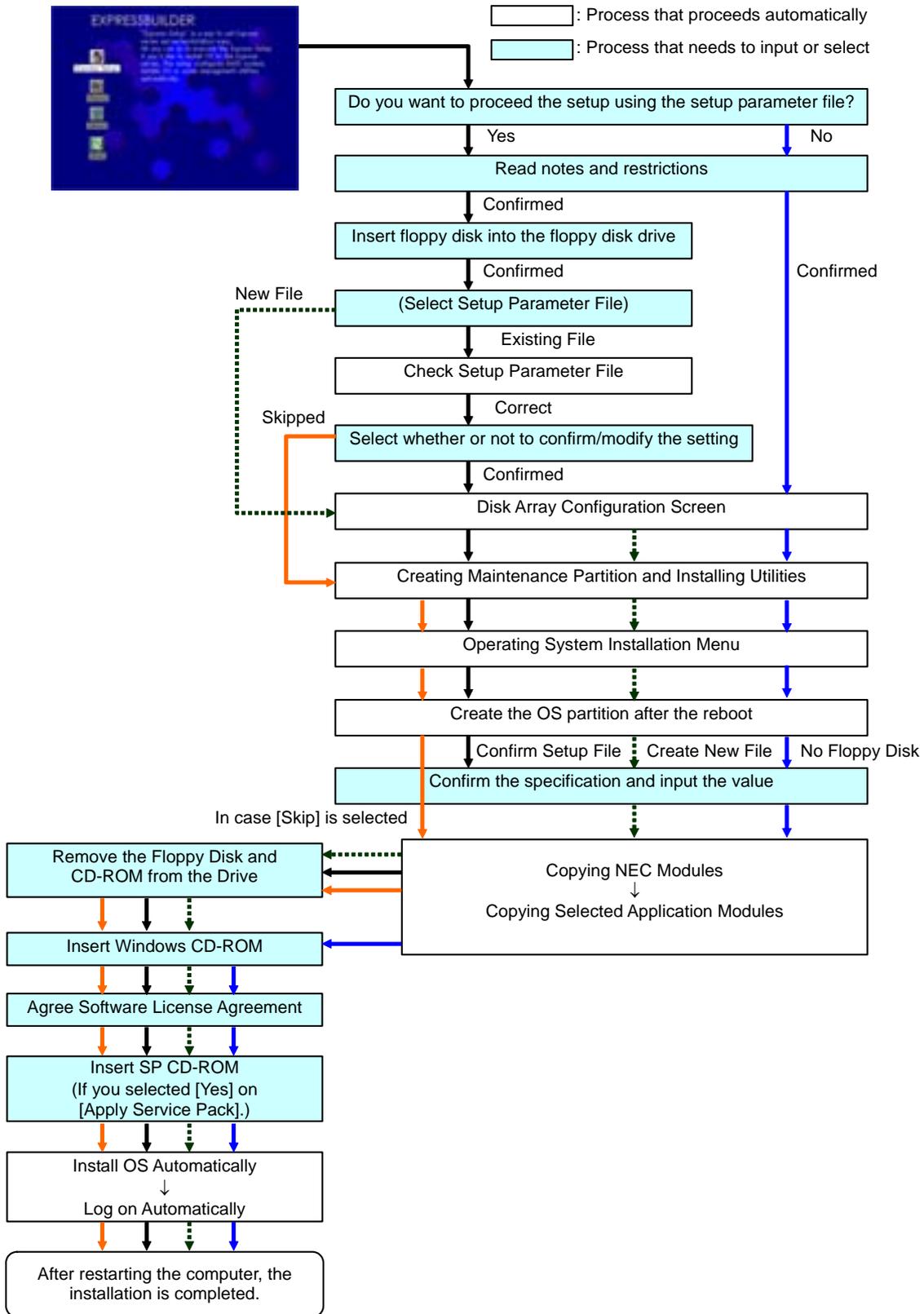
Application of Service Pack

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.

Setup Flow

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



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.

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

 **Note:**

- If you operate installing Windows Server 2003 with a Magneto-Optical device connected, the installation may not be complete successfully. In such a case, detach the MO device and then re-install the system from the beginning.
 - Install the OS before connecting another hard disk drive.
 - If you create multiple logical drives in your system, refer to "Re-installing the Operation System".
-

2. Insert the ExpressBuilder disc 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 disc 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 11: 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 click **OK** in the [Role of Computer], the installation will be done using the default values of Express Setup for the settings afterwards automatically.
 - If you click **[Cancel]** in [Basic Information] screen, the screen will go back to select the Setup File. **[Cancel]** exists only in [Basic Information] screen.
-

Once all the specifications are reviewed, the system reboots.

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

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

 Note: You can use this function only when a floppy disk drive is connected to the system.

- 12.** Remove the ExpressBuilder disc and Configuration Diskette out of their drives, and insert the Windows Server 2003 disc into the optical device drive. The [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 disc and insert the Windows Server 2003 Service pack 1 disc in the optical disc drive when prompted to do so.

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 disc 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.

To install PROSet:

1. Insert the ExpressBuilder disc 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 disc.

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".

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 190](#).
7. Click [Next].
8. Click [Finish].

Graphics Accelerator Driver

The drivers for the graphics accelerator cards that are installed in the server will setup automatically.

Refer to [“Installation of the Graphics Accelerator Driver” on page 191](#) for more information on how to install the graphics accelerator driver.

About the driver of Graphics Accelerator

When the ATI RN50 graphics accelerator board is installed or removed, we recommend you delete the graphics accelerator driver.

The procedure is as follows.

1. Click Start menu, point to [Setting] and click [Control Panel].
2. Click [Add/Remove Programs].
3. Select the graphics accelerator driver from the program list and click "Change/Remove".
 - To delete a standard graphics accelerator driver, select [Matrox Graphics Software (remove only)].
 - To delete the ATI RN50 graphics accelerator driver, select [ATI Display Driver].
4. Follow the on-screen instructions to continue the uninstallation and restart the system.
5. Installing graphics accelerator driver.

Installation of the Graphics Accelerator Driver

1. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
2. Run "SETUP.EXE" which is in the following directory:
 - To install a standard graphics accelerator driver:

<Optical disc drive Letter>:\WINNT\DOTNET\VIDEO\MATROX\SETUP.EXE.

- To install an ATI RN50 graphics accelerator driver:

<DVD-ROM Drive Letter>:\WINNT\DOTNET\VIDEO\ES1000\SETUP.EXE.

 **Note:** Choose one of above to be installed.

3. Follow the message to continue the installation.
If the dialog message "Digital Signature could not been found." appears, select [Yes] to continue.
4. Restart the system.

Installing SCSI Controller Driver (Adaptec 29160, Adaptec 29320)

Update the drivers for your system using the ExpressBuilder disc shipped with your system.

Setting for Solving Problems

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

Memory Dump (Debug Information)

This section describes the procedures for collecting memory dump (debug information) in the server.

Caution

- The staff of maintenance service representative is in charge of collecting memory dump. Customers need only to specify the memory dump.
- If any trouble occur after specifying the process below, the message to inform that the system is in short of virtual memory may appear, but continue to start the system. If you restart the system in such case, memory dump may not be stored correctly.

Follow the procedure below to specify.:

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

Caution

Windows Server 2003 x64 Editions

- We recommend you specify "Complete Memory Dump" to write the debug information.
If the mounted memory size is larger than 2GB, "Complete Memory Dump" cannot be specified so we recommend you specify "Kernel Memory Dump" instead.

- Specify the drive where there is a free area bigger than the size of "the memory capacity mounted on 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 server + 12MB". (In case the memory capacity is more than 2GB, a free area of "2048+12MB" or more).
- If the memory size exceeds 2GB due to added memory, change the write debugging information to [Kernel Memory Dump] before adding the memory. The size of the specified debugging information (memory dump) also changes when adding memory. We recommend you check (and change, if applicable) the size of the empty space in the debugging information (memory dump) write destination drive.

4. Specify "Complete memory dump" and modify [Dump file:] in the [Write debugging information] group box.
e.g. Write the debug information in D drive in the file named MEMORY.DMP
D:\MEMORY.DMP
5. Click [Settings] on the [Performance] group box.
The [Performance Options] window is displayed.
6. Click [Advanced] tab on the [Performance Options] window.
7. Click [Change] on the [Virtual memory] group box.
8. Modify [Initial Size] in the [Paging file size for selected drive] box to the value larger than [Recommended], and click [Set].

Caution

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). A paging file with an initial size large enough to store the dump file in the boot drive is required.
It may be impossible to collect correct debugging information

due to a virtual memory shortage if the paging file is insufficient, so we recommend you set a paging file large enough for the entire system.

- For more information on "Recommended" value, see "Partition Size to be Created" described earlier.
 - In case the memory is expanded, re-specify the paging file to suit the new memory size.
-

9. A message prompting to restart the system may appear according to the modified specification. In such cases, restart the system.

Windows Dr. Watson

Windows Dr. Watson is a debugger for application errors. If any application error is detected, Dr. Watson diagnoses the server and logs diagnostic information (log).

Follow the procedure below and specify Dr. Watson to collect diagnostic information.:

1. Click [Run] on Start menu.
2. Type "drwtsn32.exe" in the [Open] box, and click [OK].
The [Dr. Watson for Windows] dialog box appears.
3. Specify the location to store the diagnostic information in the [Log File Path] box.
The diagnostic information will be stored with the file name "DRWTSN32.LOG".

 *Note: You cannot specify a network path. Specify a path on a local computer.*

4. Specify the location of crash dump file in the [Crash Dump] box.

 *Note: "Crash Dump File" is a binary file that can be read with Windows Debugger.*

5. Check the following check box on the [Option] box.

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

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

6. Click [OK].

Network Monitor

Using Network Monitor helps you to investigate and manage with network trouble. To use Network Monitor, you need to restart the system after the installation has completed, so we recommend to install Network Monitor before any network trouble may occur.

1. Point to [Settings] from Start menu and click [Control Panel].
The [Control Panel] dialog box is displayed.
2. Double-click [Add/Remove Programs].
The [Add/Remove Programs] dialog box is displayed.
3. Click [Add/Remove Windows Component].
The [Windows Components Wizard] dialog box is displayed.
4. Check the [Management and Monitoring Tools] check box of the component ON and click [Next].
5. If the setup asks to install the disk, insert Windows Server 2003 disc into the optical device drive and click [OK].
6. Click [Complete] in the [Windows Component Wizard] dialog box.
7. Click [Close] in the [Add/Remove Application] dialog box.
8. Close the [Control Panel] dialog box.

To start Network Monitor, point to [Program] → [Administrative Tools] and click [Network Monitor].

For information on how to operate Network Monitor, refer to Online Help.

Installing Maintenance Utilities

Various maintenance utilities are contained in your ExpressBuilder disc. See [“Installing and Using Utilities” on page 152](#).

Updating the System - Installing Service pack

Warning

If you install from the Windows Server 2003 disc 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 disc 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 disc 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 disc.
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.

Installing Microsoft Windows Server 2003

This section describes the procedures for installing Windows Server 2003 without using Express Setup tool.

Before Installing Windows Server 2003

Please read carefully the following information BEFORE beginning your Windows Server 2003 Installation.

Installing Service Pack

You can install the Service Pack on the system. When the Service Pack is not delivered with your system, prepare it by yourself.

When using Windows Server 2003 with this equipment, apply the ServicePack 1.

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

Updating System

If you change the configuration of the system, update your system with the ExpressBuilder disc 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 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.

About the Upgrade to Windows Server 2003 R2

The "in-place upgrade" from Windows Server 2003 to Windows Server 2003 R2 is not recommended because it may overwrite any files or registries, and cause unexpected impact to the system or the applications.

If you install Windows Server 2003 R2, backup user data referring to [“Windows Server 2003 Clean Installation” on page 202](#), and reinstall Windows Server 2003 R2.

 **Note:** "In-place upgrade" is used to perform an overwrite upgrade from an installed Windows Server 2003 to Windows Server 2003 R2.

Partition Size

The minimum required partition size for installation of Windows Server 2003 is:

- Size necessary to install the system + Paging File Size + Dump File Size + Application Size
- Size necessary to install the system
 - = 3500MB (Windows Server 2003 R2)
 - = 3500MB (Windows Server 2003 with Service Pack1)
 - = 4400MB (Windows Server 2003 + Service Pack1 CD-ROM)
- Size necessary to install the system = 2900MB
- Paging File Size (Recommended) = Mounted Memory Size * 1.5
- Dump file Size = Mounted Memory Size + 12MB
- Application Size = Required Size

Caution

- The above paging file size is necessary for collecting debug information (memory dump). If you set the default value of paging file size smaller than the 'recommended' value, the accurate debug information (memory dump) may not be collected.
- The maximum paging file size which can be set on one partition is 4095 MB. If the above paging file size exceeds 4095 MB, specify 4095 MB for the paging file size.
- The dump file size for a system with more than 2 GB memory installed is '2048 MB + 12 MB'.
- If you install additional applications, add necessary space to the partition to install these programs.

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

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

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

1. Set the "Size required for installation + Paging file size".
2. See Appendix F and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.
(If the disk does not have enough free space to enable the file size to be written, then after installing the system using the "Size required for installation + Paging file size," install an additional new disk.)

Installing Microsoft Windows Server 2003

You will need the following for Windows Server 2003 installation:

- ExpressBuilder disc
- Microsoft Windows Server 2003 Standard Edition (disc)
- 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 Windows 2003 OEM-DISK for ExpressBuilder with the following two procedures:

Creating from the menu which appears when running the BULL NovaScale Server with ExpressBuilder

Use this procedure if you have only BULL NovaScale Server to create Windows 2003 OEM-DISK for ExpressBuilder.

If you have only BULL NovaScale Server to create 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 disc in the optical device drive.
4. Press the **RESET** switch or press **Ctrl + Alt + Delete** to reboot the server.(You may also turn off and then on again to reboot the server.)
The system will boot from the disc and ExpressBuilder starts.
5. Select [Create Support Disk] from [Tools].
6. Select [Windows Server 2003 OEM-DISK for ExpressBuilder] from [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, and Windows Server 2003 x64 Editions
- Windows 2000
- Windows Me/98/95
- Windows NT 4.0
- Windows XP, and Windows XP x64 Edition

You can create 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 disc in the optical device drive.
[Master Control Menu] is displayed.
4. Click [Setup] with left mouse button and 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 disc 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 then on again.

4. If the RAID controller (including embedded HostRAID feature) 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.

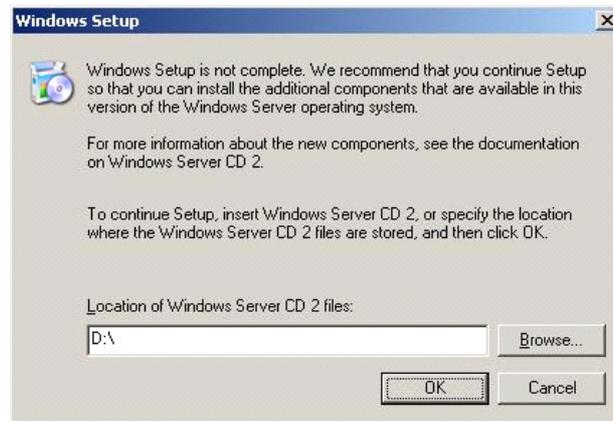
The following message is displayed.

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. Select the proper model, and press **Enter**.

7. 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.
8. 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.

9. Insert Microsoft Windows Server 2003 R2 DISC 2 CD-ROM into the DVD-ROM drive. Confirm the parameters and click [OK].
10. 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.
11. Execute the tasks described in [“Driver Installation and Device Settings” on page 209](#) and [“Updating System” on page 197](#) of the manual.

Upgrade installation

Procedures below upgrade the installed Windows 2000 to Windows Server 2003.

1. Power on the system and start Windows 2000.

2. Log on as an administrator.
3. Insert the Windows Server 2003 disc into the optical device drive.
[Select an operation] dialog box is displayed.

 **Note:** If the [Select an operation] dialog box does not appear, start \SETUP.EXE from optical device drive.

4. Select [Install Windows Server 2003].
A dialog box asks to select the upgrade or clear installation.
5. Select "Upgrade (recommended)" and click **Next**.
Follow the messages and continue.
The system will restart after copying the files.

 **Note:** You can leave the Windows Server 2003 disc in the optical device drive.

6. If the RAID controller (including embedded HostRAID feature) is installed, press **F6** while the message "Setup is inspecting your computer's hardware configuration..." is displayed.

 **Note:** There is no visible indication on screen when F6 has been pressed.

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

Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter. Currently, Setup will load support for the following mass storage devices.

The following message is displayed.

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

8. Insert the Windows Server 2003 OEM-DISK for ExpressBuilder in the floppy disk drive, and press **Enter**.

A list of mass storage devices is displayed.
Select the proper adapter and press **Enter**.

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.
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 x64 Edition DISC 2 CD-ROM from the DVD-ROM drive, and restart the system.
13. Update the system.
14. Install the driver and make detailed settings.

- **SCSI controller**

The following message may appear on the display during the upgrade installation to Windows Server 2003. In this case;

Please type D:/i386 and click OK. (D: CD-Drive)

Insert disk

The file 'adpu160m.sys' on Adaptec Windows 2000 Family Manager set V1.12 S2 is needed.

Type the path where the file is located, and then click OK.

- If PROSet is already installed, uninstall the PROSet before upgrading.
If the teaming function is enabled, disable the function before uninstalling PROSet.
- Once the upgrade installation is completed, the [Device Driver Wizard] dialog box may be displayed.
If it is displayed, click **Cancel**, then update 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 modify with the following procedure.

1. Click Start menu, right-click [My Computer], and specify [Manage] to start [Computer Management].
2. Specify the [Disk Management] in the left side of the window.
3. Right-click the volume you want to modify the drive letter and specify the [Change Drive Letter and Path...].
4. Click [Yes].
5. Choose the [Assign a drive letter] and specify the drive letter you want to assign.
6. Click [OK].
7. If the following message appears, click [Yes]:

Changing the drive letter of a volume may cause programs to no longer run.
Are you sure you want to change this drive letter?

8. Close the [Computer Management].

Procedure for License Authentication

The Product Key used in the procedure for license authentication should match with the COA label on which the Windows Server 2003 product key is written.

 **Note:**

- *Execute the activation within 30 days. The system may be locked after 30 days have passed.*
 - *The COA label may be attached to your server.*
-

Updating the System - Applying the Service Pack -

 **Caution**

If you install the Windows Server 2003 disc which contains Service Pack 1 to your system, you do not have to apply Service Pack 1 again.

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 disc into the optical device drive. [Master Control Menu] is displayed on the screen.
3. Click [Setup] with left mouse button and click U [Update BULL NovaScale system] section.
4. Follow the on-screen instructions to continue system update.
5. Click [Restart Computer] to restart the system.
6. Remove the ExpressBuilder disc from the optical device drive immediately after clicking [Restart Computer].

 **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 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 disc 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 "PROSet.exe" in the following directory:
<Optical Disc 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 "Typical" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.

Network Driver

Specify the details of network driver.

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

[When PROSet is not installed]

1. The [Local Area Connection Properties] dialog box 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 network adapter is displayed.
- 3. Click [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 is displayed.
 - Procedure with the standard start menu: click Start menu, point to [Control Panel] and click [Intel PROSet].
 - Procedure with the classic start menu:
 - a. Click Start menu, point to [Settings] and click [Control Panel].
 - b. Double-click [Intel(R) PROSet] on the [Control Panel] window.
2. Click [(Network Adapter Name)] in the list.
3. Click [Speed] and specify the [Link Speed & Duplex Settings] value the same as the value specified for HUB.
4. Click [Apply] and click [OK].

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

You can operate the process on the property dialog box for local area network which can be 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.

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 disc.

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".

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 210](#).
7. Click [Next].
8. Click [Finish].

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 disc 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 ATI RN50 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 disc from the DVD-ROM drive, follow the on-screen directions and restart the system.

About the Driver of Graphics Accelerator (ATI RN50)

When the ATI RN50 graphics accelerator board is installed or removed, it is necessary to manually update the display drivers.

Follow the procedure below.

1. Click the Start menu, point to [Setting] and click [Control Panel].
2. Click [Add/Remove Programs].
3. Select the graphics accelerator driver from the program list and click "Change/Remove".
 - To delete a standard graphics accelerator driver, select [Matrox Graphics Software (remove only)].
 - To delete the ATI RN50 driver, select [ATI Display Driver].

 *Note: Choose the graphics accelerator driver which has already been installed.*

4. Follow the message to continue the uninstallation and restart the system.
5. Installing graphics accelerator driver.
See "Installation of the graphics accelerator driver" described later.
The driver is installed.

Installing SCSI Controller Drivers

Update the drivers for your system using the ExpressBuilder disc included with your system.

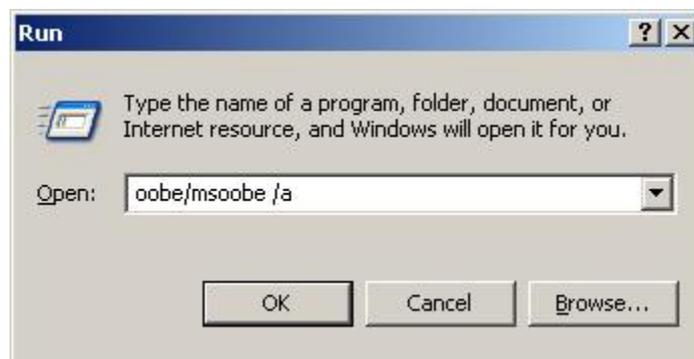
The SCSI drivers will be installed automatically.

About Windows Activation

Windows Server 2003 x64 Editions must be activated before it can be used.

The Windows activation process is as follows.

1. Click [Run] on [Start] menu.
Type as follows in the [Open:] box, and click [OK].
oobe/msoobe /a



2. Click **Next** when prompted to do so on the *Activate Windows* screen.
3. Follow the on-screen instructions, and process with the "Windows activation".

Setting for Collecting Memory Dump (Debug Information)

Set for collecting memory dump.

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 disc 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 \times 1.5

Dump file Size= Mounted Memory Size + 1 MB

Application Size = Required Size

Caution

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). A paging file with an initial size large enough to store the dump file in the boot drive is required.
It may be impossible to collect correct debugging information due to a virtual memory shortage if the paging file is insufficient, so we recommend you set a paging file large enough for the entire system.
 - Regardless of the size of the mounted memory, or the Write debugging information (type of memory dump), the maximum size of the dump file is 'The size of the mounted memory + 1MB'.
 - If you install any application program or the like, add necessary space to the partition to install these programs.
-

For example, if the mounted memory size is 512 MB, the minimal size of the partition will be calculated by the above formula as follows:

$4100 \text{ MB} + (512 \text{ MB} * 1.5) + (512 \text{ MB} + 1 \text{ MB}) + \text{Application Size} = 5381 \text{ MB} + \text{Application Size}$

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

1. Set the "Size required for installation + Paging file size".
2. Set the debugging information (equivalent to the dump file size) so that it is written to a separate disk.

(If necessary, install an additional new disk.)

Installing Microsoft Windows Server 2003 x64 Editions

You will need the following for the installation of the Windows Server 2003 x64 Editions:

- ExpressBuilder disc
- 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 disc 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 disc 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 disc 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].

Procedure for License Authentication

Product Key used in the procedure for license authentication should be matched with the COA label in which the product key contained in Windows Server 2003 is written.

 **Note:**

- *Execute the activation within 30 days. System may be locked after 30 days is passed.*
 - *COA label may be attached to your server.*
-

Updating the System

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 disc 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 disc 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 disc 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 "DWSETUP.exe" in the following directory:
<DVD-ROM driveLetter>:\WINNT\W2K3AMD\NS4\PROSet\WS3XP64
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 226.](#)
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 disc.

When using 100BASE TX adapters:

"DVD-ROM drive Letter:\WINNT\W2K3AMD\NS4\PRO100\WS03_32E"

When using 1000BASE T adapters:

"DVD-ROM drive Letter:\WINNT\W2K3AMD\NS4\PRO1000\WS03_32E"

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 226](#).
7. Click [Next].
8. Click [Finish].

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 disc 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 disc from the DVD-ROM drive, follow the on-screen directions and restart the system.

About the Driver of Graphics Accelerator (ATI RN50)

When the ATI RN50 graphics accelerator board is installed or removed, it is necessary to manually update the display drivers.

Follow the procedure below.

1. Click the Start menu, point to [Setting] and click [Control Panel].
2. Click [Add/Remove Programs].
3. Select the graphics accelerator driver from the program list and click "Change/Remove".
 - To delete a standard graphics accelerator driver, select [Matrox Graphics Software (remove only)].
 - To delete the ATI RN50 driver, select [ATI Display Driver].

 *Note: Choose the graphics accelerator driver which has already been installed.*

4. Follow the message to continue the uninstallation and restart the system.
5. Installing graphics accelerator driver.
See "Installation of the graphics accelerator driver" described later.
The driver is installed.

Installing SCSI Controller Drivers

Update the drivers for your system using the ExpressBuilder disc shipped with your system.

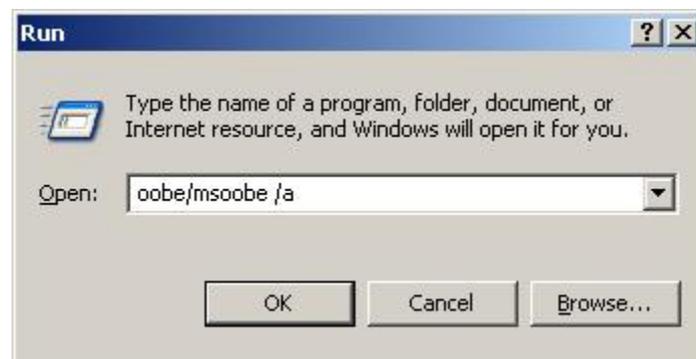
The SCSI drivers will be installed automatically.

About Windows Activation

Windows Server 2003 x64 Editions must be activated before it can be used.

The Windows activation process is as follows.

1. Click [Run] on [Start] menu.
Type as follows in the [Open:] box, and click [OK].
oobe/msoobe /a



2. Click **Next** when prompted to do so on the *Activate Windows* screen.
3. Follow the on-screen instructions, and process with the "Windows activation".

Setting for Collecting Memory Dump (Debug Information)

Set for collecting memory dump using the procedure described in the corresponding section.

System Security

To help prevent unauthorized entry or use of the system, the system may include several security features, both hardware and software.

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:

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

Using Passwords

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 system if Password on Boot is enabled in the BIOS Setup.

Maintenance

This chapter describes the daily maintenance of the system and precautions when relocating or storing the system.

Making Backup Copies

We recommend you make backup copies of your valuable data stored in hard disks of the system on a regular basis. For backup storage devices suitable for the system and backup tools, consult with your sales agent.

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 system on a regular basis to keep the system in a good shape.

Warning

- Do not disassemble, repair, or alter the system.
 - Do not look into the optical device drive.
 - Do not remove the lithium battery.
 - Disconnect the power plug before working with the system.
-

Caution

- Avoid installation in extreme temperature conditions.
 - Make sure to complete board installation.
-

Cleaning the External Surfaces of the system

Caution

- To avoid altering the material and color of the system, do not use volatile solvents such as thinner and benzene to clean the system.
 - The power receptacle, the cables, the connectors on the rear panel of system, and the inside of the system must be kept dry. Do not moisten them with water.
-

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

If stains remain on the surfaces:

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

2. Unplug the power cord of the system 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 system with the cloth prepared in Step 4.
6. Soak a soft cloth in water, squeeze it firmly, wipe the system with it once again.
7. Wipe the system with a dry cloth.
8. Wipe off dust from the fan exhaust opening on the rear of the system with a dry cloth.

Cleaning the Interior of the system

One important item in a good maintenance program is regular and thorough cleaning of the interior of the system, especially around the motherboard.

Dust buildup inside the system 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 system 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 system depends on the environment in which it is located. For most office environments, you probably should clean the system every 12 months. For more severe environments, clean the interior every 6 months.

To clean the interior of the system, 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 system 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 system:

1. Turn off the system 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 system.
6. Reinstall the logic cover and the drive cover.
7. Reconnect all power cables and turn on the system.

Cleaning the Keyboard

1. Power off the system 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 system.
The POWER/SLEEP lamp goes off.
3. Turn the mouse upside down, and rotate the mouse ball cover counter clockwise 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 system.
The POWER/SLEEP lamp is lit.
2. Press the optical drive tray Open/Close button on the front of the optical drive.
The tray opens.
3. Hold the media and take it out from the tray.

 **Note:** Do not touch the signal side of the disc with your hand.

4. Wipe the tray with a dry soft cloth.

 **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 an Optical Disc:

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

 **Caution**

- Wipe disks from the center to the outside.
 - Use only disc cleaner if necessary. Cleaning an optical disc with record spray/cleaner, benzene, or thinner causes damage to the disk contents. At worst, inserting the disk into the system may cause failure.
-

Relocating/Storing The Server

Follow the procedure below to relocate or store the server:

Caution

If the server needs to be relocated/stored in a different environment or room, contact your service representative. If the server contains hard disk drives:

- Make sure to make a backup copy of your valuable data.
 - Make sure not to shock the hard disk drives.
-

1. Take out the removable media from their drives, if any.
2. Power off the server (the POWER/SLEEP lamp goes off).
3. Unplug the power cord of the server from a power outlet.
4. Remove all the cables from the server.

Caution

Enlist the help of at least one person to help you lift and carry the server.

5. Carry the server holding it by the bottom side.

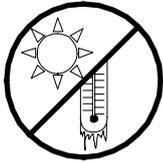
Caution

Do not hold the front mask to lift the server. The front mask may disengage from the server, causing personal injury.

6. Protect the server with the shock-absorbing materials, and pack it securely.

Care and Handling

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



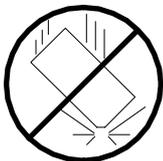
Protect the system from extremely low or high temperatures. Let the system warm (or cool) to room temperature before using it.



Keep the system away from magnetic forces.



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



Protect the system from being bumped or dropped.



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



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

Solving Problems

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 cover removed can damage your system components.

For proper cooling and airflow, always replace the covers before powering on your system.

Static Precautions

An electrostatic discharge (ESD) can damage disk drives, option boards, and other components. You can provide some ESD protection by wearing an anti-static 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.

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 system 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,
 - to enter Setup
 - You should note the error and press **F1** to resume the boot-up process, or **DEL** 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 the Error Messages: Beep Codes section.

System Viewers

Monitor the occurrence of fault with the Remote Manager (NEC ESMPRO, ASWM or another utility, depending on your system) during the system operation.

Especially take note on whether any alert is reported to the Remote Manager on the management PC.

Lamps

The system includes lamps to indicate the system states by a variety of colors and display patterns on the front panel, hard disk drive, and power supply.

Refer to [“Status Indicators” on page 22](#) for more information.

System Diagnostics Tool

This tool is available on your ExpressBuilder disc.

Please [*see “System Diagnostics” on page 172*](#) for more information.

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 [“*Troubleshooting Guide*” on page 241](#).

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

Problems Running New Application Software

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

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

Problems and Suggestions

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

Table 12: 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> <p>If your HDDs are plugged onto a PCI card, this is normal. The LED will light only when detecting activity on the optical drives.</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 System

Fail to power on the system:

- Is the system properly supplied with power?
 - Check if the power cord is connected to a power outlet (or UPS) that meets the power specifications for the system.
 - 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.

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

Fail to power off the system

- Is the power switch enabled?
 - Restart the system and start 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.
 - Make sure the jumper switches have been returned to their original positions after CMOS clearing. 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.

- 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 system?
 - 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 system once again. Do not perform any keyboard or mouse operation until the BIOS start-up message appears when you restart the system.

- Does the system contain appropriate memory boards or PCI devices?

- Operation of the system 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 system has any external devices connected, power on the external devices first, then the system.
- 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 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 system.
 - The keyboard or mouse does not operate if it is connected when the system is powered (not applicable to USB devices). Power of the system first and connect it properly.
- Are the system 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 (read or write) to the floppy disk:

- Does the floppy disk drive contain a floppy disk?
 - Insert a floppy disk into the floppy disk drive until it clicks.
- Is the floppy disk write-protected?
 - Place the write-protect switch on the floppy disk to the "Write-enabled" position.
- Is the floppy disk formatted?

- Use a formatted floppy disk or format the floppy disk in the floppy disk drive. Refer to the manual that comes with the OS for formatting a floppy disk.

Fail to access to the Optical Disc Drive:

- Is the disc properly set in the optical disc drive tray?
 - The tray is provided with a holder to secure the disc. Make sure that the disc is placed properly in the holder.
- Is the disc applicable to the system?
 - Discs for Macintosh are 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.

Inserted the correct disc 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 disc dirty or injured?
 - Take the disc out of the optical disc 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 system?
 - Operation of any device that we do not authorize 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 system?
 - Operation of any SCSI device that we do not authorize is not guaranteed.
- Is the cable connection changed?
- Are SCSI devices properly configured?
 - When the system 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 system has an optional SCSI controller installed and SCSI devices connected to it, use the POST 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 system 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 system. 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 system. Check the setting with the BIOS SETUP utility.
- Have the protocol and service already configured?
 - Install the distinctive network driver for the system. 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 Windows Server 2003 x64 Editions

In some cases, an event log may be 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 operate normally.

In some cases, an event log may be 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 is not registered when rebooting the system, it can operate normally.

Problems with Windows Server 2003

A log appears and no network cable is connected to the network port:

When network cable is not connected with a port, a log (see the example below) may be found in event log. But this has no affect on the behavior of Lan driver.

Event ID: 6

Source: E100B

Type: Error

Description: Hardware failure detected.

Machine: (Name of your system)

Lan: 100BASE

Solution: Connect a network cable in a port and then reboot the system or change the [Smart Power Down] value to "Off", the log will not be found in event log any more.

The system displays the message below and fails to log on:

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 system.

- Is the ExpressBuilder disc in the optical disc drive?
 - Take out the ExpressBuilder disc and restart the system.
- Is the OS broken?
 - Use the recovery process to recover the system.

The OS presents unstable operation:

- Did you update the system?
 - Installing a network drive after installation of the OS may cause unstable operation. Use the ExpressBuilder disc 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 system is not found on the network:

- Is the cable connected properly?
 - Connect the proper cable to the network port on the rear of the 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 system. Check the setting with the BIOS setup utility.
- Have the protocol and service already configured?
 - Install the distinctive network driver for the system. 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.

Problems with ExpressBuilder

When the system does not boot from the ExpressBuilder disc, check the following:

- Did you set the ExpressBuilder during POST and restart the system?
 - If you do not set the ExpressBuilder during POST and restart the system, 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 system. Use the CMOS Setup utility to change the boot device order to boot the system from the optical disc drive first.
<Menu to check: [Boot]>
- 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 13: Error Messages

| Message | Cause and Solution |
|---|--|
| This machine is not supported | This ExpressBuilder version is not designed for this system. Execute the ExpressBuilder on the compliant system. |
| 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.
If you want to perform a re-setup, do it manually.
- 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 the disc or checking the disc:
 - Press R. When the message appears again even if you press R, restart the Express Setup from the beginning. In case the same result occurred after the restart of installation, contact Maintenance Service Company and ask them to check the optical disc drive.
- Express Setup terminated and asks to input setup information.
 - There are some errors on the specified setup information. Follow the instruction to input the correct value. It is not necessary to cancel the installation.
- [OK] appears on the [Role of Computer] screen.

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

<The Default Value for Windows Server 2003>

| The specification of network protocol | |
|---------------------------------------|--|
| Protocol | TCP/IP [DHCP Specified] |
| Service | Select sharing Microsoft network files and printer |
| Client | Microsoft network client |
| Component | SNMP |
| Application | NEC ESMPRO Agent |
| | MegaRAID Storage Manager (disk array systems) |
| | Power Console Plus (disk array systems) |

- [OK] does not appear on [Role of Computer] screen.
 - The [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], [OK] will not appear even if you enter [Back] to go back to the [Role of Computer] screen.
- Select [Use Existing Array] at [New/Existing RAID Configuration], but the OS is installed in the whole area of the disk.
 - Is there any other partition than the partition to re-use (excluding maintenance area)? If the partition other than the one to re-use does not exist, the setup will reserve the whole area of the disk to install 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.
- 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.
- Connected more than two Network adapter and specified different protocol for each adapter, but all the protocols are specified on either adapter.
 - This is intentional. Each adapter is specified so that all the installed protocols can be used.
- 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 adapters 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 adapters are 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 for more specific information.

Fail to install the OS

- Is the disk array controller configured?
 - Provide proper configuration for the disk array controller by using the appropriate utility.

Fail to start the OS:

- Is the BIOS of the disk array controller changed?
 - Set the BIOS correctly by using the Configuration Utility.
- Does the POST recognizes the disk array controller?

- Make sure that the disk array controller is connected correctly, and power on the server.
If the disk array controller is still not recognized correctly, the disk array controller may be defective. 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 an identical capacity than that of the failed drive.
- Is RAID0 configured?
 - RAID0 has no data redundancy, therefore, Rebuild is disabled in the RAID0 configuration. Replace the failed hard disk drive, create the configuration data again and initialize the hard disk drives. Then recover the data by using backup data.

Auto rebuild fails

- Was a sufficient time taken for the hot-swapping of the hard disk drives?
 - To allow the auto rebuild to operate correctly, wait 90 seconds or longer between the removal of the failed hard disk drive and the installation of a new hard disk drive.
- Is the configuration correct?
 - Check the setting of auto rebuild using the Configuration Utility.

A hard disk drive fails

Contact your service representative.

Problems with Master Control Menu

The master control menu fails to appear:

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

Collecting Event Log

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

Caution

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

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

For more information, refer to Windows Online Help.

Collecting Configuration Information

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

In order to collect information, "Diagnostic Program" is used.

Caution

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

1. Point to [Settings] in Start menu, and click [Control Panel].
The [Control Panel] dialog box appears.
2. Double-click [Management Tool], and double-click [Computer Management].
The [Computer Management] dialog box appears.
3. Click [System Tool]: [System Information].
4. Click [Save as System Information File] in the [Operation] menu.
5. Enter the file name to save in the [File Name] box.
6. Click [Save].

Collecting Dr. Watson Diagnostic Information

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

Memory Dump (depending on your configuration)

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 system 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.
-

Off-Line Maintenance Utility

The Off-line Maintenance Utility is an OS-independent maintenance program. When you are unable to start the OS-dependent 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 disc 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 system.
-

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 system is in successful operation.

- From the disc

Set the ExpressBuilder disc in the optical disc 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 disc.

- 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 system 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

If You Need Assistance

If you have a problem with your computer, first refer to *[“Solving Problems” on page 240.](#)*

 **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

This section details the POST error codes and messages, and the meaning of the diagnostic LEDs colour combinations.

Error Messages after Power-on

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

Refer to the table below to troubleshoot such errors.

Note that using the keyboard or mouse at the times listed below may lead the POST to assume that there is a keyboard controller error and stop the process.

- 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, and you think it may be due to one of the above reasons, restart the server once again. If the error message is not displayed again, you may assume there is no hardware error. To ensure normal operation of the server, however, make sure to follow the following restrictions.

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

POST Error Messages

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

Caution

Note the on-screen messages before contacting your service representative. It will prove helpful for the maintenance..

Table 14: POST Error Messages and Handling

| Error code | Error message | Recommended action |
|------------|---|---|
| 0200 | Failure Fixed Disc | 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 it does not correct the error, contact your service representative. |
| 0213 | Keyboard lock - Unlock key switch | Release the lock of the key switch. If it does not correct the error, contact your service representative. |
| 0220 | Monitor type does not match CMOS - Run SETUP | Start the Setup. If it does not correct the error, 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 time | |
| 0250 | System battery is dead - Replace and run SETUP | Contact your service representative to replace the battery. Afterwards, restart the computer, and start the SETUP to provide the settings. |
| 0251 | System CMOS checksum bad - default configuration used | The default values have just been set. Start the SETUP to provide the settings again. If it does not correct the error, contact your service representative. |
| 0252 | Password checksum bad - Password cleared | The password has just been cleared. Start the SETUP to provide the settings again. |
| 0260 | System timer error | Start the SETUP to set the date and time again. |
| 0270 | Real time clock error | If the error occurs again, contact your service representative. |
| 0271 | Check date and time setting | |
| 02D0 | System cache error - Cache disabled | The cache cannot be used. Contact your service representative. |
| 02D1 | System memory exceeds the CPU's caching limit | Contact your service representative. |
| 02F4 | EISA CMOS not write able | |
| 02F5 | DMA Test Failed | |
| 02F6 | Software NMI Failed | |
| 02F7 | Fail-safe Timer NMI failed | |

Table 14: POST Error Messages and Handling (Continued)

| Error code | Error message | Recommended action |
|------------|---|---|
| 0B22 | CPUs are installed out of order | Replace the CPU. |
| 0B28 | Unsupported CPU detected on CPU slot 1 | Make sure that the system supports the CPU. If you are not sure, contact your service representative and request a maintenance. |
| 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 | An error is detected in each CPU, and 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 | |
| 0B70 | The error occurred during the temperature sensor reading. | |
| 0B71 | System temperature out of the range | |
| 0B74 | The error occurred during the voltage sensor reading | |
| 0B75 | System voltage out of the range | |
| 0B80 | BMC memory test failed | Turn off the power once and then on again to restart the server. |
| 0B81 | BMC Firmware Code Area CRC check failed | |
| 0B82 | BMC Core Hardware Failure | If it does not correct the error, contact your service representative. |
| 0B83 | BMC 1BF or 0BF check failed | |
| 0B8A | BMC SEL area full | Start SETUP and select Server > Event Log Configuration > Clear all Event Logs and press Enter to clear all the event logs. |
| 0B8B | BMC progress check timeout | Turn off the power once and then on again to start the server. |
| 0B8C | BMC command access failed | |
| 0B8D | Could not redirect the console - BMC Busy | If the error cannot be corrected, contact your service representative. |
| 0B8E | Could not redirect the console - BMC Error | |
| 0B8F | Could not redirect the console - BMC Parameter Error | |
| 0B90 | BMC Platform Information Area corrupted | |
| 0B91 | BMC update firmware corrupted | |
| 0B92 | Internal Use Area of BMC FRU corrupted | This is not a fatal error. Turn off the power once and then on again to restart the server. If it does not correct the error, contact your service representative. |
| 0B93 | BMC SDR Repository empty | Turn off the power once and then on again to restart the server. If it does not correct the error, 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 it does not correct the error, contact your service representative. |
| 0B95 | BMC FRU device failure | |

Table 14: POST Error Messages and Handling (Continued)

| Error code | Error message | Recommended action |
|------------|---|--|
| 0B96 | BMC SDR Repository failure | Turn off the power once and then on again to restart the server. |
| 0B97 | BMC SEL device failure | |
| 0B98 | BMC RAM test error | If it does not correct the error, contact your service representative. |
| 0B99 | BMC Fatal hardware error | |
| 0B9A | Management controller not responding | Update the RMC firmware. If it does not correct the error, contact your service representative. |
| 0B9B | Private I2C bus not responding | Turn off the power once and then on again to restart the server. |
| 0B9C | BMC internal exception | |
| 0B9D | BMC A/D timeout error | If it does not correct the error, contact your service representative. |
| 0B9E | SDR repository corrupt | |
| 0B9F | SEL corrupt | |
| 0BB0 | SMBIOS - SRAM data read error | Contact your service representative. |
| 0BB1 | SMBIOS - SRAM data checksum bad | |
| 8100 | Memory error detected in DIMM group #1 | Contact your service representative to replace the DIMM in the relevant group. |
| 8101 | Memory error detected in DIMM group #2 | |
| 8102 | Memory error detected in DIMM group #3 | |
| 8103 | Memory error detected in DIMM group #4 | |
| 8160 | Mismatch processor speed detected on processor 1 | Contact your service representative. |
| | Expansion ROM not initialized - PCI Mass Storage Controller in slot xx (xx: slot number) | Disable the initialization of the optional device expansion ROM by using the BIOS Setup utility. |
| | H/W Configuration of the BMC is corrupted. !! Update BMC F/W Configuration by configuration tool !! !! Refer to BMC Configuration Manual !! | Use the ExpressBuilder to configure the optional remote management card. |

POST Error Beep Codes

The following table lists POST error beep codes. Prior to system Video initialization, BIOS uses these beep codes to inform users on error conditions. The beep code is followed by a user visible code on the diagnostic LEDs.

Table 15: POST Error Beep Codes

| Beep code | Description | Recommended action |
|---------------------|--|---|
| 3-3 (repetitive) | ROM checksum error | Contact your service representative to replace the motherboard. |
| 1-2-2-3 | | |
| 1-3-1-1 | DRAM refresh test error | Check if the DIMMs are properly connected. If the error persists, contact your service representative to replace the DIMM or the motherboard. |
| 1-3-1-3 | Keyboard controller error | Disconnect the keyboard and connect it again. If the error persists, contact your service representative to replace the motherboard. |
| 1-3-3-1 | No memory or capacity check error | Check if the DIMMs are properly connected. If the error persists, contact your service representative to replace the DIMM or the motherboard. |
| 1-3-4-1 | DRAM address error | |
| 1-3-4-3 | DRAM test Low Byte error | |
| 1-4-1-1 | DRAM test High Byte error | |
| 1-5-1-1 | CPU startup error | Contact your service representative to replace the motherboard. |
| 1-5-2-1 | No CPU installed | Contact your service representative to replace the CPU or the motherboard. |
| 1-5-4-4 | Power failure | Contact your service representative to replace the motherboard. |
| 2-1-2-3 | BIOS ROM copyright test error | |
| 2-2-3-1 | Unexpected interrupt test error | |
| 1-2 | Option ROM initialization error | Check that the BIOS Setup is correctly configured. If an expansion of the Option ROM for additionally installed PCI board is not displayed, check that the PCI board is properly installed. If the error persists, contact your service representative to replace the PCI board or the motherboard. |
| 1-5-4-2 | The AC power supply is interrupted due to a power failure or momentary voltage drop, and the system is restarted | This is not an error. |

Error Messages on the Virtual LCD

On the Web browser of ExpressScope Engine (BMC), you can view error messages on a virtual LCD. The following table lists error messages displayed on the upper and lower lines and actions to take.

Refer to the ExpressScope Engine User's Guide for details of virtual LCD.

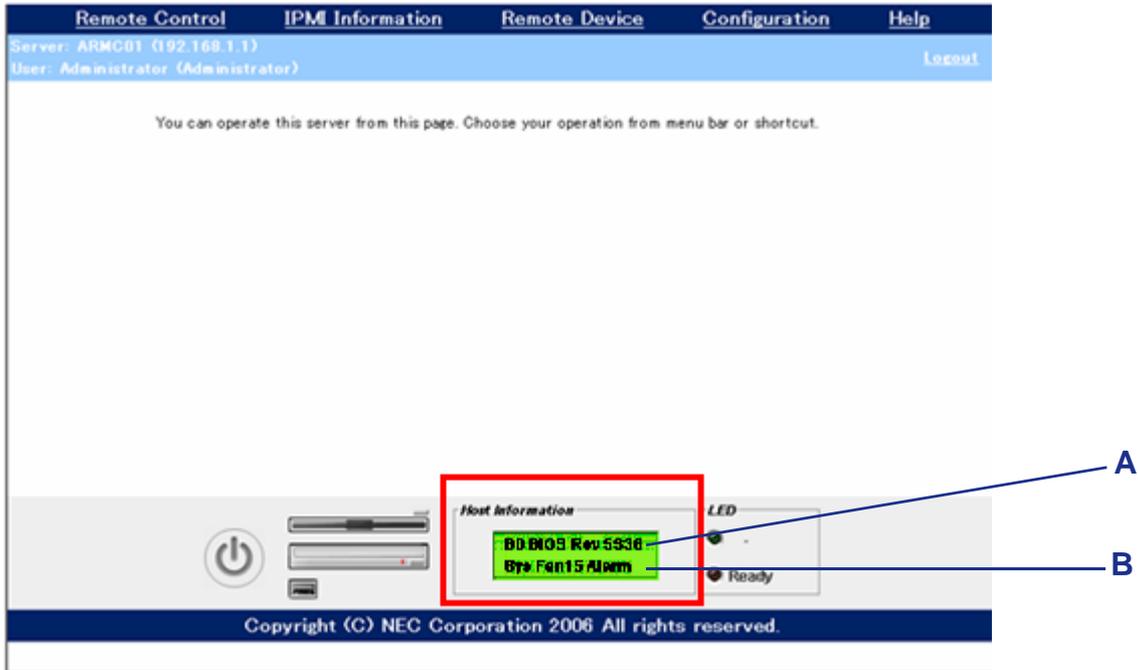


Figure 103: ExpressScope Engine Virtual LCD

A: BIOS Message

B: BMC Message

*.BIOS Messages***Table 16: BIOS Messages**

| On-screen BIOS message | Description | Action |
|------------------------|--|--|
| XX BIOS rev XXXX | POST is in progress | Wait until the POST completes. |
| Prepare to Boot | Displayed when the POST completes normally. | Wait until the boot process completes. |
| Mem Reconfigured | The system is operating with degrading memory. | |
| Mem Err Disabled | A correctable error frequently occurs in DIMM. | |
| CPU Reconfigured | The system is operating with a degraded CPU. | Contact your service representative. |
| Memory C-Err XX | A correctable error occurs in the DIMM. | |
| Memory U-Err XX | An uncorrectable error occurred in the DIMM. | |
| PCI Bus SERR XX | SERR of the PCI bus occurred. | |
| PCI Bus PERR XX | PERR of the PCI bus occurred. | |
| Chipset Err XXXX | Chipset error occurred. | |

*.BMC Messages***Table 17: BMC Messages**

| On-screen BIOS message | Description | Action |
|------------------------|---|--|
| Proc1 VccpAlm XX | Voltage alarm was detected. | Contact your service representative. |
| BB P_Vtt Alm XX | XX=09: Upper limit alarm | |
| BB +1.5v Alm XX | XX=02: Lower limit alarm | |
| BB +1.8v Alm XX | XX=07: Upper limit warning | |
| BB +3.3v Alm XX | XX=00: Lower limit warning | |
| BB +5.0v Alm XX | | |
| BB +12v Alm XX | | |
| VBAT Alm XX | | |
| BB Temp2 Alm 00 | Low temperature alarm was detected in chassis. | A fan failure or fan dogging may occur. |
| BB Temp2 Alm 02 | Low temperature warning was detected in chassis. | |
| BB Temp2 Alm 07 | High temperature alarm was detected in chassis. | Contact your service representative and request a maintenance. |
| BB Temp2 Alm 09 | High temperature warning was detected in chassis. | |
| CPU1 Temp Alm 00 | Low temperature alarm was detected in CPU. | |
| CPU1 Temp Alm 02 | Low temperature warning was detected in CPU. | |
| CPU1 Temp Alm 07 | High temperature alarm was detected in CPU. | |
| CPU1 Temp Alm 09 | High temperature warning was detected in CPU. | |
| DUMP Request | The dump button was pressed. | Wait for completion of the memory dump collection. |
| OS shutdown Alm | OS STOP error occurred | Record the on-screen message and contact your service representative after the memory dump collection. |
| Power On Cnt Alm | Power failure occurred. | Contact your service representative. |
| 240VA Power Down | | |

Table 17: BMC Messages (Continued)

| On-screen BIOS message | Description | Action |
|------------------------|--|--|
| Power Unit 1 Alm | Power unit 1 failed. | Make sure that the power cord is properly connected. If the same error persists, contact your service representative. |
| Proc Missing | CPU is not installed. | Contact your service representative to replace the CPU or motherboard. |
| Proc T-Trip | Forcedly powered off due to abnormal temperature of CPU1. | |
| Processor IERR | Internal error (IERR) occurred in CPU1 | |
| SMI timeout | Timeout error occurred during system management interrupt. | |
| WDT | Watchdog timer timeout error occurred. | |
| Sys Fan 1 Alarm | Fan alarm was detected. | A fan failure or dogging may occur. |
| Sys Fan 2 Alarm | | Contact your service representative and request a maintenance. |
| Sys Fan 3 Alarm | | |

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

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 Changes” 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 18: BIOS Setup Keys

| Key | Function in Setup Menu |
|--------------------------|---|
| F1 | Get Help about an item. |
| ESC | <p>The <Esc> key provides a mechanism for backing out of any field. This key will undo the pressing of the Enter key.</p> <p>When the <Esc> key is pressed while editing any field or selecting features of a menu, the parent menu is re-entered.</p> <p>When the <Esc> key is pressed in any sub-menu, the parent menu is re-entered.</p> <p>When the <Esc> key is pressed in any major menu, the exit confirmation window is displayed and the user is asked whether changes can be discarded. If “No” is selected and the <Enter> key is pressed, or if the <Esc> key is pressed, the user is returned to where he/she was before <Esc> was pressed, without affecting any existing any settings. If “Yes” is selected and the <Enter> key is pressed, setup is exited and the BIOS returns to the main System Options Menu screen.</p> |
| Left or right arrow keys | <p>The left and right arrow keys are used to move between the major menu pages.</p> <p>The keys have no affect if a sub-menu or pick list is displayed.</p> |

Table 18: BIOS Setup Keys (Continued)

| Key | Function in Setup Menu |
|-----------------------|--|
| Up or down arrow keys | The up/down arrow is used to select the previous/next value in a pick list, or the previous/next option in a menu item's option list. The selected item must then be activated by pressing the <Enter> key. |
| - | The minus key on the keypad is used to change the value of the current item to the previous value. This key scrolls through the values in the associated pick list without displaying the full list. |
| + | The plus key on the keypad is used to change the value of the current menu item to the next value. This key scrolls through the values in the associated pick list without displaying the full list. |
| Enter | The <Enter> key is used to activate sub-menus when the selected feature is a submenu, or to display a pick list if a selected option has a value field, or to select a sub-field for multi-valued features like time and date. If a pick list is displayed, the <Enter> key will select the currently highlighted item, undo the pick list, and return the focus to the parent menu. |
| Tab | The <Tab> key is used to move between fields. For example, <Tab> can be used to move from hours to minutes in the time item in the main menu. |
| F9 | Load default configuration values. |
| F10 | Save configuration values and exit. |

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.

Configuration Examples

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

Time and Date Settings

You can also change the time and date settings via the operating system commands.

- Select [Main] - [System Time].
- Select [Main] - [System Date].

Link with Management Software

- To control power supply of the server with NEC ESMPRO Manager via the network
 - Select [Advanced] - [Advanced Chipset Control] - [Wake On LAN/PME] - [Enabled].
 - Select [Server] - [AC LINK] - [Stay Off].

ATA Drive Settings

- To check the ATA drives connected with the onboard ATA channels.
Select [Main] - [Primary IDE Master], [Primary IDE Slave], [IDE Secondary/Master], and [IDE Secondary/Slave].
- To configure the RAID drive.
Select [Advanced] - [Peripheral Configuration] - [SATA Controller Mode Option] - [Enhanced]. Then select [Advanced] - [Peripheral Configuration] - [SATA RAID Enabled] - [Enabled], and use the RAID configuration utility (see "RAID Configuration Utility" in this chapter).

Caution

Be sure to set to [Enabled] after executing [Load Setup Defaults] or CMOS clear. Leaving this parameter as the factory-set value (Disabled) may destroy the data in hard disk drive.

UPS

To link power supply with the UPS

- To power on the server when power is supply from the UPS
Select [Server] - [AC LINK] - [Power On].

- To keep the server off-powered even when power is supplied from the UPS
Select [Server] - [AC LINK] - [Stay Off].

Boot

- To change the boot order of devices connected to the server
Select [Boot] and specify the boot order.
- To display POST check results
Select [Advanced] - [Boot-time Diagnostic Screen] - [Enabled].
You can also press **Esc** while the Bull log is on the screen to display POST check results.
- To control from the remote console
Select [Server] - [Console Redirection] and set each item.

Memory

- To check the installed memory (DIMM board) status
Select [Advanced] - [Memory Configuration] and check the status indications.
The on-screen DIMM group numbers and socket locations on the mother board are associated as shown in the following figure.

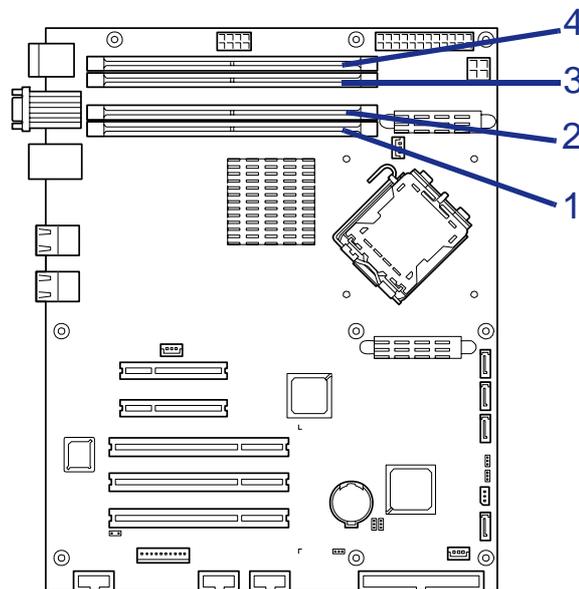


Figure 104: Memory Slots

- To clear the memory (DIMM board) error information
Select [Advanced] - [Memory Configuration] - [Memory Retest] - [Yes] and reboot.

- To run power-on memory test

Select [Advanced] - [Memory Configuration] - [Extended RAM Step] - [1MB] and reboot.

CPU

- To check the installed CPU status

Select [Main] - [Advanced Processor Options] – [Processor 1 CPUID] and check the status indications.

- To clear the CPU error information

Select [Main] - [Advanced Processor Options] - [Processor Retest] – [Yes] and reboot.

Keyboard

- To set Numlock

Select [Advanced] - [Numlock] – [On]/[Off].

Event Log

- To clear event logs

Select [Server] - [Event Log Configuration] - [Clear all Event Logs] and press **Enter**.

Security

- To set passwords on the BIOS

- Select [Security] - [Set Supervisor Password] and enter a password.
- Select [Security] - [Set User Password] and enter a password.
- Set Supervisor password first, then User password.

External Devices

- To set up external devices

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

Internal Devices

- To install the disk array controller board or SCSI controller board

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

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

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

Saving the Configuration Data

Caution

If the SATA hard disk drives are used in disk array configured with the on-board RAID controller, be sure to select [Advanced] - [Peripheral Configuration] - [SATA Controller Mode Option] - [Enhanced]. Then, select [Advanced] - [Peripheral Configuration] - [SATA RAID Enable] - [Enabled]. Leaving this parameter as the factory-set value (Disabled) may destroy the data in hard disk drive.

- To save the current configuration data
Select [Exit] - [Exit Saving Changes] or [Save Changes].
- To discard changes to the current configuration data
Select [Exit] - [Exit Discarding Changes] or [Discard Changes].
- To load the user-defined default
Select [Exit] - [Load Setup Defaults].

Main Menu

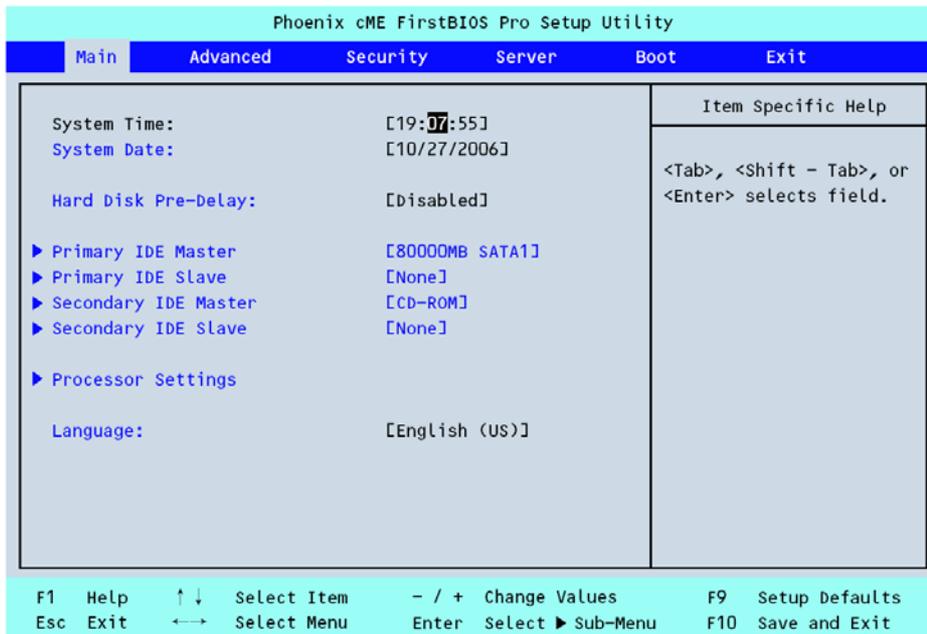


Figure 105: Main Menu

Table 19: Main Menu

| Feature | Choices or Display Only | Description | Your Setting |
|---------------------|--|---|--------------|
| System Time | [HH:MM:SS] | Hours valid values are 0 to 23. Minutes valid values are 0 to 59. Seconds valid values are 0 to 59. | |
| System Date | [MM/DD/YYYY] | Month valid values are 1 to 12. Day valid values are 1 to 31. Year valid values are 1998 to 2099. | |
| Hard Disk Pre-Delay | Disabled 3 seconds 6 seconds 9 seconds 12 seconds 15 seconds 21 seconds 30 seconds | Set a delay to allow slower spin-up drives to be ready. | |

Table 19: Main Menu

| Feature | Choices or Display Only | Description | Your Setting |
|---|--|--|--------------|
| Primary IDE Master Primary IDE Slave Secondary IDE Master Secondary IDE Slave Third IDE Master Third IDE Slave | Press Enter to open the submenu | Set the information on the device connected to each channel on the submenu. Some settings may be changed, however, we recommend you do not change them. | |
| Processor Settings | Press Enter to open the submenu | Shows the processor settings submenu. | |
| Language | English Français Deutsch Español Italiano | Select the language in which the BIOS is displayed. | |

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

Caution

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

- After transporting the device.
- After storing the device
- After pausing the device under the following environmental conditions: temperature: 10°C to 35°C and humidity: 20% to 80%)

Check the system clock roughly once per month. When the system clock is installed in a system requiring high time precision, we recommend using a time server (NTP server).

If the system clock is not accurate in spite of regular checks, contact your service representative for maintenance.

Processor Settings Submenu

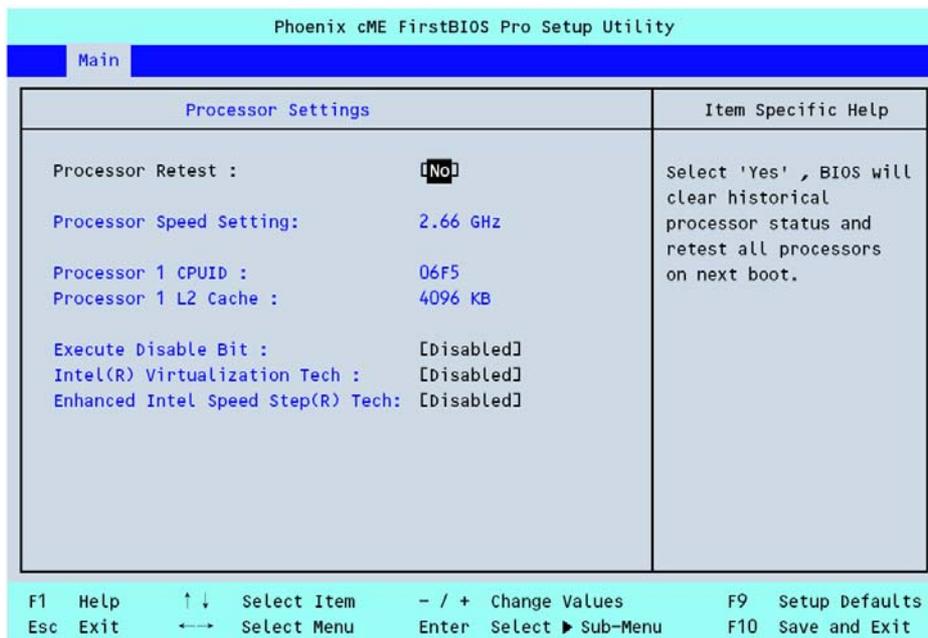


Figure 106: Processor Settings Submenu

Table 20: Processor Settings Submenu

| Feature | Choices or Display Only | Description | Your Setting |
|-----------------------------------|----------------------------|---|--------------|
| Processor Retest | No Yes | If you select [Yes], the BIOS will clear the historical processor status and retest all the processors on the next boot. This parameter is automatically reset to "No" at the next boot. | |
| Processor Speed Setting | nnn GHz | Displays the processor clock speed (View only). | |
| Processor 1 CPUID | Numeral (0Fxx) Disabled | Displays CPU ID for processor 1. "Disabled" indicates that the processor is defected. "Not Installed" indicates that no CPU is installed. (View only) | |
| Processor 1 L2 Cache | – | Displays L2 cache size for processor 1. | |
| Execute Disable Bit | Disabled Enabled | Setting this item to Disabled sets the XD future flag to "0". This menu is displayed when the installed processor is Pentium 4 Processor E0 Stepping or later. | |
| Intel(R) Virtualization Tech | Disabled Enabled | Enables or disables the virtualization technology of an Intel processor. | |
| Enhanced Intel Speed Step(R) Tech | Disabled Enabled | Specify whether to enable or disable the enhanced Speed Step technology of Intel processor. | |

Advanced Menu

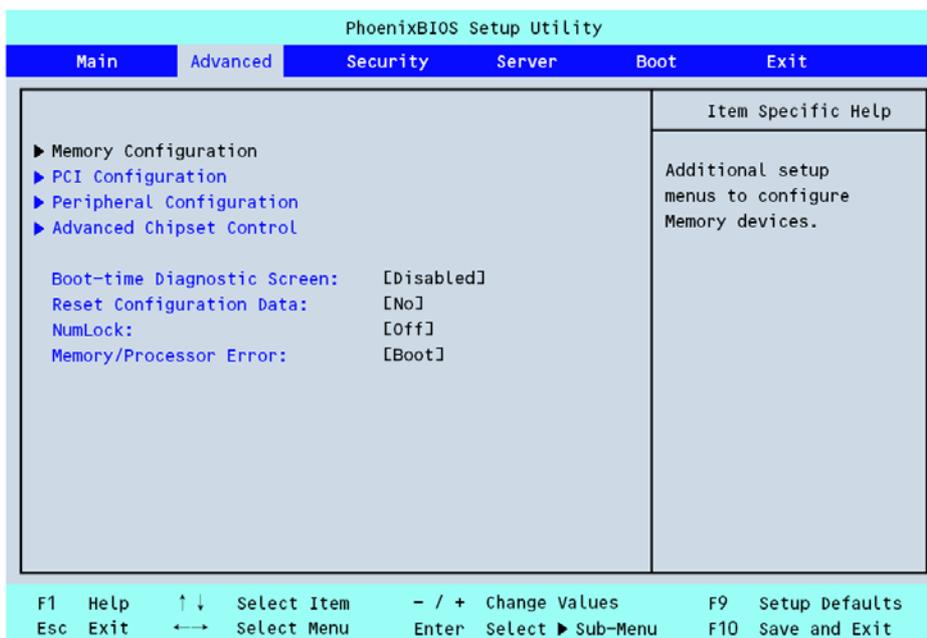


Figure 107: Advanced Menu

Table 21: Advanced Menu

| Feature | Choices or Display Only | Description | Your Setting |
|-----------------------------|--|--|--------------|
| Memory Configuration | Press Enter to open the submenu | Opens the corresponding submenu. | |
| PCI Configuration | Press Enter to open the submenu | Opens the corresponding submenu. | |
| Peripheral Configuration | Press Enter to open the submenu | Opens the corresponding submenu. | |
| Advanced Chipset Control | Press Enter to open the submenu | Opens the corresponding submenu. | |
| Boot-time Diagnostic Screen | Disabled Enabled | Specifies whether the self-test (POST) running screen is displayed or not on the screen. When disabled, the BIOS will display a full screen Bull logo during POST. Press Esc to switch to the POST execution screen. | |
| Reset Configuration Data | No Yes | Select Yes to clear the system configuration data during the next boot. It is automatically reset to No in the next boot. | |
| NumLock | On Off | Turns the keyboard numlock on or off. | |
| Memory/Processor Error | Boot Halt | When Halt is selected, the boot process stops when an error occurs. | |

Memory Configuration Submenu

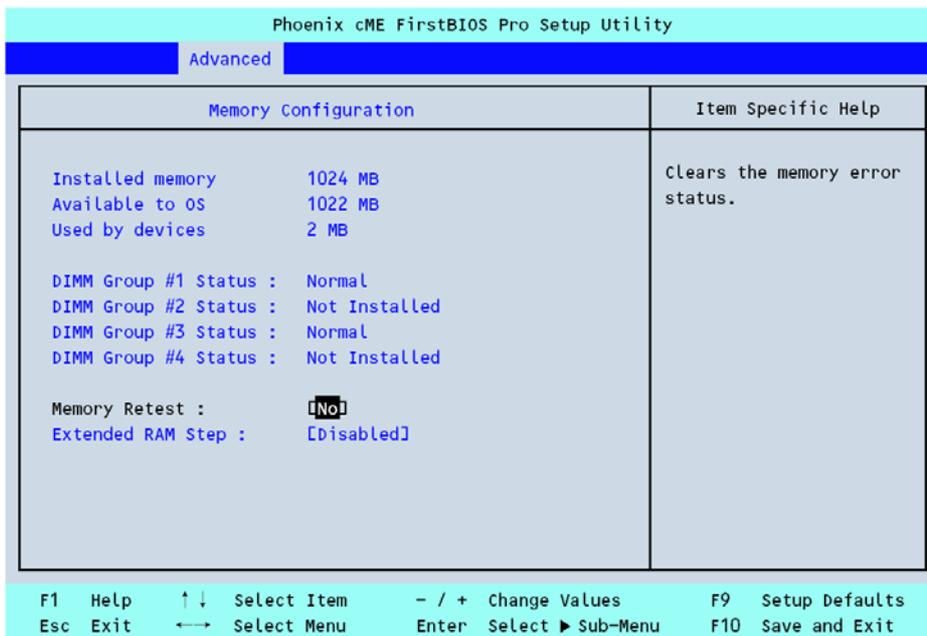


Figure 108: Memory Configuration Submenu

Table 22: Memory Configuration Submenu

| Feature | Choices or Display Only | Description | Your Setting |
|----------------------------|--|---|--------------|
| Installed Memory | Display only | Information only. The amount of memory available in the system in the form of installed DIMMs, in units of MB or GB. | |
| Available to OS | Display only | Indicates the total capacity of the memory available for the OS. | |
| Used by devices | Display only | Indicates the total capacity of the basic memory used for each device. | |
| DIMM Group #1 to #4 status | Normal Not installed Disabled | Indicates the current memory status. - Normal indicates that the memory devices are operating normally. - Not installed indicates that no memory devices are installed. - Disabled indicates that one or more memory devices are defective. | |

Table 22: Memory Configuration Submenu (Continued)

| Feature | Choices or Display Only | Description | Your Setting |
|-------------------|---|--|--------------|
| Memory Retest | No Yes | Causes the BIOS to retest all the memory on the next boot. | |
| Extended RAM Step | 1MB 1KB Every location Disabled | - 1MB indicates that the memory test is done in 1MB units. - 1KB indicates that the memory test is done in 1KB units. - Disabled indicates that only the memory initialisation is done. | |

PCI Configuration Submenu

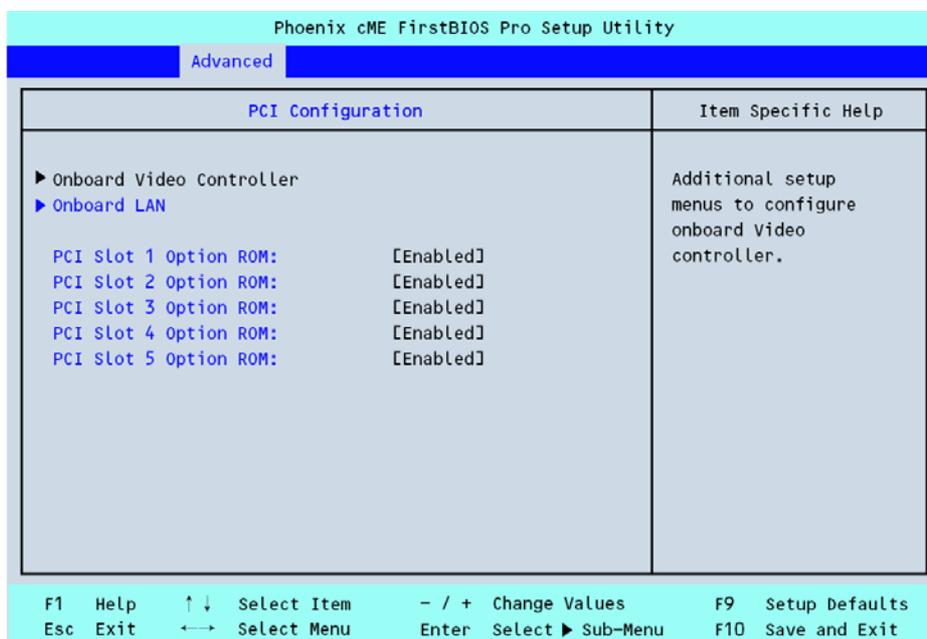


Figure 109: PCI Configuration Submenu

Table 23: PCI Configuration

| Feature | Choices or Display Only | Description | Your Setting |
|--------------------------|--|----------------------------------|--------------|
| Onboard Video Controller | Press Enter to open the submenu | Opens the corresponding submenu. | |

Table 23: PCI Configuration (Continued)

| Feature | Choices or Display Only | Description | Your Setting |
|-------------------------|--|--|--------------|
| Onboard LAN | Press Enter to open the submenu | Opens the corresponding submenu. | |
| PCI Slot 1-5 Option ROM | Enabled Disabled | <p>Enables the option ROM scan of the selected device.</p> <p>Set this item to Enabled:</p> <ul style="list-style-type: none"> -when the graphics accelerator board is installed, or - when the disk array controller or the SCSI controller boards to be installed are connected to the hard disk drive in which the OS is installed. <p>Set this item to Disabled:</p> <ul style="list-style-type: none"> - when a LAN controller board with an installation of the option ROM BIOS is used but the board does not provide network booting. <p>Disabling the Option ROM Scan saves memory consumption and time for startup.</p> | |

Onboard Video Controller Submenu

Table 24: Onboard Video Controller Submenu

| Feature | Choices or Display Only | Description | Your Setting |
|----------------|----------------------------|---|--------------|
| VGA controller | Enabled Disabled | Enables or disables the onboard video controller. | |

Onboard LAN Submenu

Table 25: Onboard Video Controller Submenu

| Feature | Choices or Display Only | Description | Your Setting |
|-------------------------|----------------------------|---|--------------|
| LAN controller | Enabled Disabled | Enables or disables the onboard LAN controller. | |
| LAN 1-2 Option ROM Scan | Enabled Disabled | Enables or disables the onboard LAN controller BIOS scan. | |

Peripheral Configuration Submenu

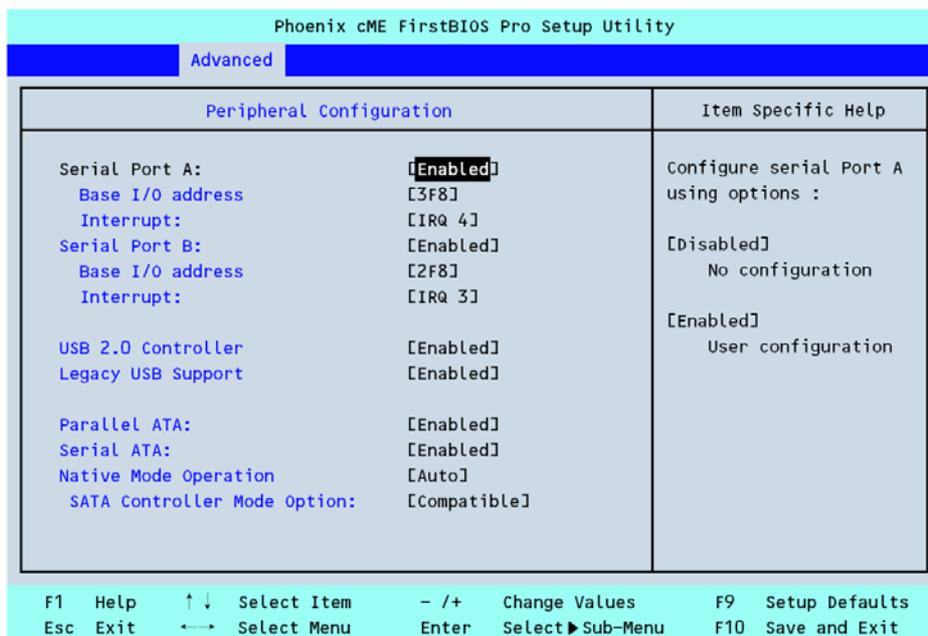


Figure 110: Peripheral Configuration Submenu

 **Note:** The interrupt and/or base I/O address cannot be overlapped by others. If the value set for the interrupt or base I/O address is used in another resource, the yellow asterisk (*) appears. Reset properly any item featuring a yellow asterisk.

Table 26: Peripheral Configuration Submenu

| Feature | Choices or Display Only | Description | Your Setting |
|--------------------|------------------------------|--|--------------|
| Serial Port A | Enabled Disabled | Enables or disables the Serial A port. | |
| Base I/O Address | 3F8h 2F8h 3E8h 2E8h | Selects the base I/O address for Serial A. | |
| Interrupt | IRQ 3 IRQ 4 | Selects the Interrupt Request line for Serial A. | |
| Serial Port B | Enabled Disabled | Enables or disables the Serial B port. | |
| Base I/O Address | 3F8h 2F8h | Selects the base I/O address for Serial B. | |
| Interrupt | 3 4 | Selects the Interrupt Request line for Serial B. | |
| USB 2.0 Controller | Enabled Disabled | Enables or disables the USB 2.0 device. | |

Table 26: Peripheral Configuration Submenu (Continued)

| Feature | Choices or Display Only | Description | Your Setting |
|-----------------------------|-------------------------------|---|--------------|
| Legacy USB support | Enabled Disabled | Determines whether the USB keyboard is available in an OS that does not support the USB standard. | |
| Parallel ATA | Enabled Disabled | Enables or disables the parallel ATA ports. | |
| Serial ATA | Enabled Disabled | Enables or disables the serial ATA ports. | |
| Native Mode Operation | Auto Serial ATA | Selects the ATA native mode (OS-dependent). | |
| SATA Controller Mode Option | Compatible Enhanced | <p>- Compatible mode: SATA and PATA drives are automatically detected and recognised as legacy mode.</p> <p>- Enhanced mode: SATA and PATA drives are automatically detected and recognised as native mode.</p> <p>Note: Windows 2000 does not support the enhanced mode.</p> | |
| SATA RAID Enabled | Enabled Disabled | <p>Enables or disables the RAID drives using the onboard SATA.</p> <p>Note: if you attempt to start the system from a SATA hard disk drive with a different setting, data may be destroyed.</p> | |
| SATA AHCI Enabled | Enabled Disabled | The server does not support the AHCI feature. Always set this item to Disabled . | |

Advanced Chipset Control Submenu

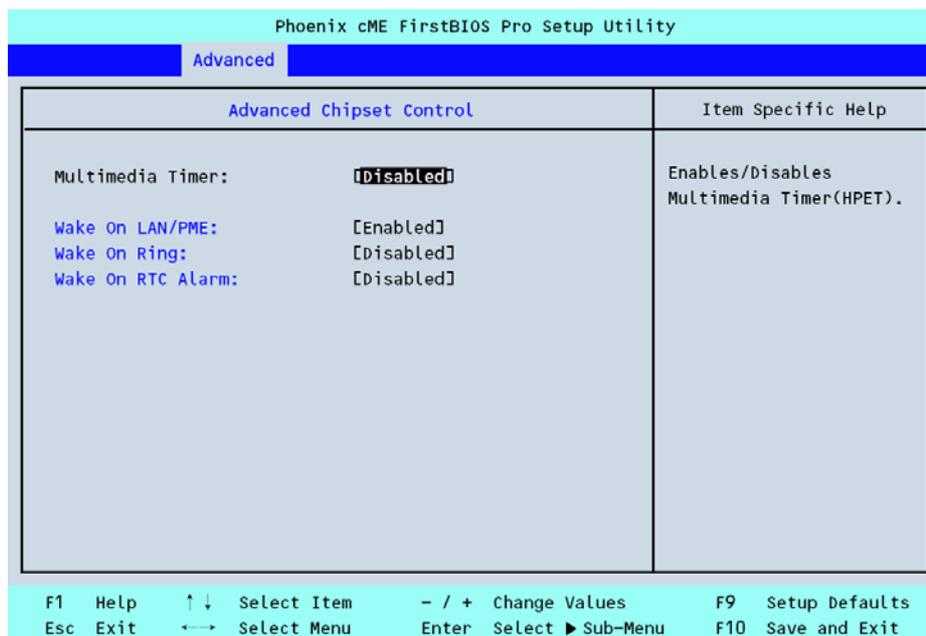


Figure 111: Advanced Chipset Control Submenu

Table 27: Advanced Chipset Control Submenu

| Feature | Choices or Display Only | Description | Your Setting |
|-------------------|----------------------------|---|--------------|
| Multimedia Timer | Disabled Enabled | Enables or disables the timer corresponding to multimedia. | |
| Wake on LAN/PME | Disabled Enabled | Enables or disables the remote power-on function through the network. | |
| 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 scheduling of the remote power on function using the RTC alarm feature. | |

 **Note:** When AC power is not supplied anymore to the server, the remote power-on function (Wake On LAN/PME and Wake On Ring) is disabled at the next boot. Press the POWER switch to restart the system. The Wake On LAN/PME and Wake On Ring functions are enabled when DC power is once more supplied to the server.

Security Menu.

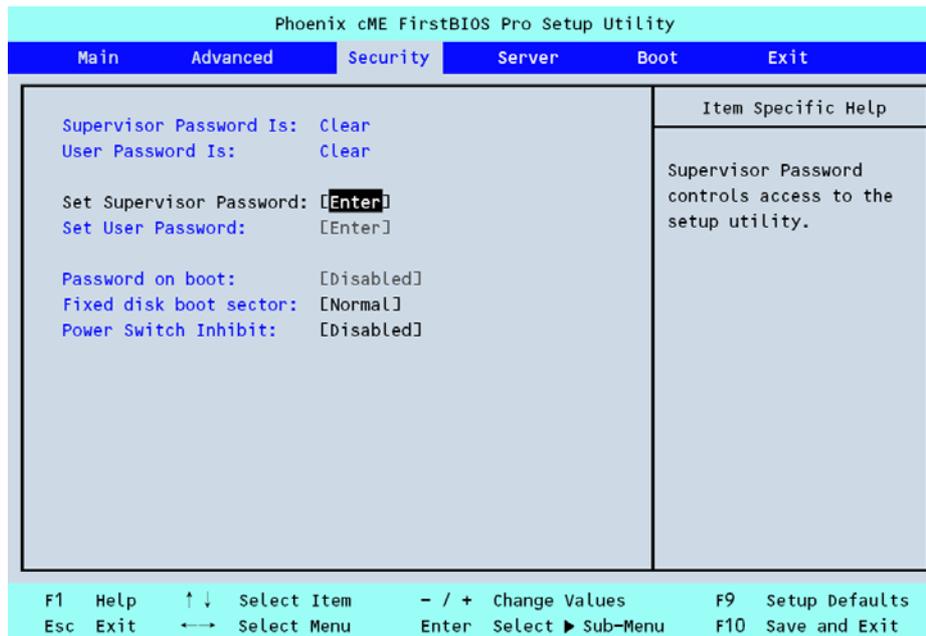


Figure 112: Security Menu

Table 28: Security Menu

| Feature | Choices or Display Only | Description | Your Setting |
|-------------------------|-------------------------|--|--------------|
| Supervisor password is | Clear Set | Indicates whether the supervisor password is set (display only). | |
| User password is | Clear Set | Indicates whether the user password is set (display only). | |
| Set Supervisor password | Press Enter | Press Enter to display the supervisor password input screen. This password enables all the SETUP menus to be accessed. This setting can be done only when logged in using a Supervisor account. | |
| Set User password | Press Enter | Press Enter to display the user password input screen. This password restricts access to the Setup menus. You must set a supervisor password before setting a user password. | |

Table 28: Security Menu (Continued)

| Feature | Choices or Display Only | Description | Your Setting |
|------------------------|--------------------------------|---|--------------|
| Password on boot | Enabled Disabled | When it is set to Enabled , the user is required to enter the BIOS password during the system boot. You must first set a supervisor password. When a supervisor password is set and this option is disabled, the BIOS determines that a user is booting. | |
| Fixed disk boot sector | Normal Write Protect | Allows or prevents write operations to the boot sector of the hard disk drive. | |
| Power Switch Inhibit | Enabled Disabled | Enables or disables the power switch. | |

 **Caution**

- Set passwords only after you have installed an operating system.
 - Contact your service representative if you forget a password.
-

Server Menu

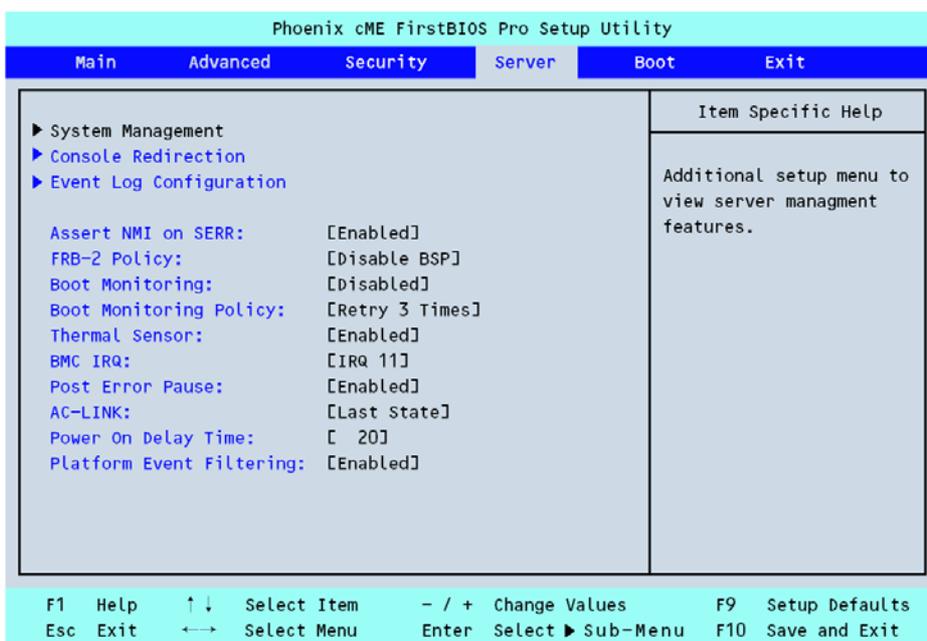


Figure 113: Server Menu

Table 29: Server Menu

| Feature | Choices or Display Only | Description | Your Setting |
|-------------------------|---|---|--------------|
| System Management | Press Enter to open the submenu | Opens the corresponding submenu. | |
| Console Redirection | Press Enter to open the submenu | Opens the corresponding submenu. | |
| Event Log Configuration | Press Enter to open the submenu | Opens the corresponding submenu. | |
| Assert NMI on PERR | Enabled Disabled | Specifies whether the PCI PERR is supported or not. | |
| FRB-2 Policy | Disable FRB2 Timer Disable BSP Do not Disable BSP Retry 3 Times | Sets the FRB level 2 timer. | |
| Boot Monitoring | Disabled Every 5 minutes between 5 and 60 minutes | Enables or disables the boot monitoring function on booting, or select the timeout time limit. To use this function, install the NEC ESMPRO Agent. Set this item to Disabled if the system is booted from the OS and the NEC ESMPRO Agent is not installed. | |

Table 29: Server Menu (Continued)

| Feature | Choices or Display Only | Description | Your Setting |
|--------------------------|---|---|--------------|
| Boot Monitoring Policy | Retry 3 Times Retry Service Boot Always Reset | Specify the processing at the occurrence of timeout during boot monitoring. If Retry 3 times is selected, the system is reset after a timeout occurrence and the OS boot is retried up to three times. If Retry Service Boot is selected, the system is reset after a timeout occurrence and the OS boot is retried up to three times. Afterwards the boot is tried from the service partition for three times. A failure in the third boot causes the system to stop booting. If Always Reset is selected, the system is reset after a timeout occurrence and the OS boot is retried repeatedly. Note that if no service partition exists in the system, the OS boot is retried repeatedly from the system partition. | |
| Thermal Sensor | Enabled Disabled | Enables or disables the thermal sensor monitoring function. When it is set to Enabled , if a thermal error is detected, the system stops at the end of the POST. | |
| BMC IRQ | Disabled 11 | Sets the BMC IRQ. | |
| Post Error Pause | Enabled Disabled | When set to Enabled , the system stops at the end of the POST when an error is detected. | |
| AC-LINK | Stay Off Last State Power On | Defines the power state after a power failure. Select Power On to power on the server from an UPS (Uninterruptible Power Supply). | |
| Power On Delay Time | 20 255 | When Power On or Last State is selected on the above line, specifies a delay time before powering on. Select a value in the 20 to 255 seconds range. Set a delay of 10 seconds at least when using an UPS (Uninterruptible Power Supply). | |
| Platform Event Filtering | Enabled Disabled | This item is not used when the ExpressScope Engine notification feature is enabled. | |

System Management Submenu

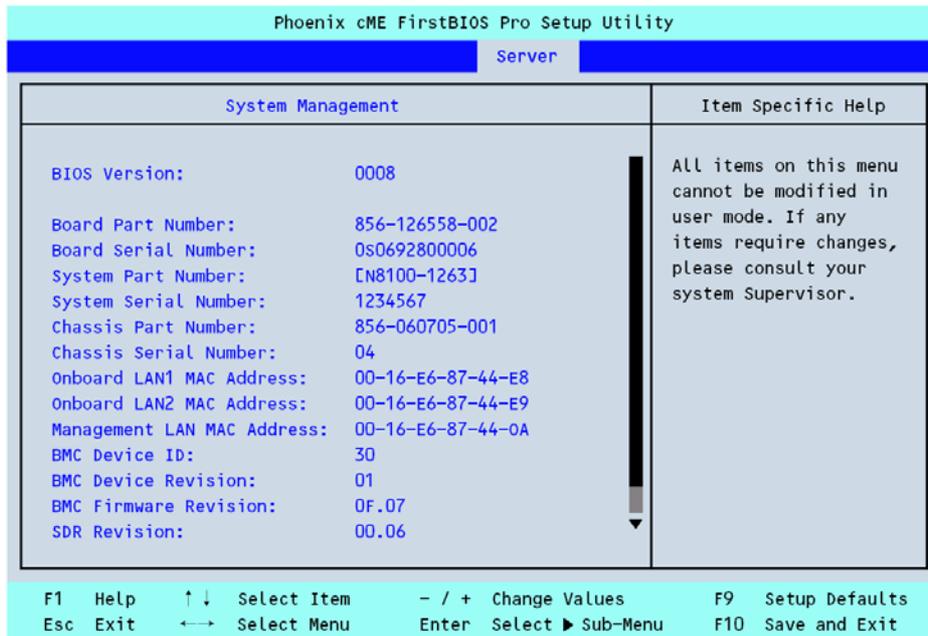


Figure 114: System Management Submenu

Table 30: System Management submenu

| Feature | Choices or Display Only | Description | Your Setting |
|----------------------------|-------------------------|--|--------------|
| BIOS version | Display only | Displays the current BIOS version. | |
| Board Part Number | Display only | Displays the motherboard part number. | |
| Board Serial Number | Display only | Displays the motherboard serial number. | |
| System Part Number | Display only | Displays the system code number. | |
| System Serial Number | Display only | Displays the system serial number. | |
| Chassis Part Number | Display only | Displays the chassis part number. | |
| Chassis Serial Number | Display only | Displays the chassis serial number. | |
| Onboard LAN1 MAC Address | Display only | Displays the MAC address of the onboard network controller 1. | |
| Onboard LAN2 MAC Address | Display only | Displays the MAC address of the onboard network controller 2. | |
| Management LAN MAC Address | Display only | Displays the MAC address of the management network controller 2. | |
| BMC device ID | Display only | Displays the device ID of the BMC (Baseboard Management Controller). | |
| BMC Device Revision | Display only | Displays the revision of the BMC (Baseboard Management Controller) device. | |
| BMC Firmware Revision | Display only | Displays the revision of the BMC (Baseboard Management Controller) firmware. | |
| SDR Revision | Display only | Displays the revision of the SDR (Sensor Data Record). | |
| PIA Revision | Display only | Displays the revision of the PIA (Platform Information Area). | |

Console Redirection Submenu

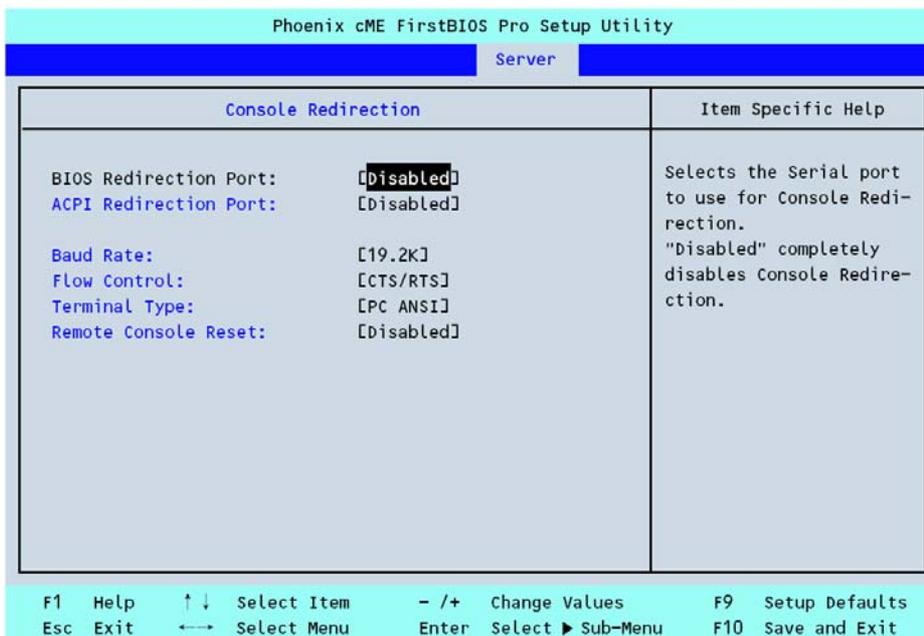


Figure 115: Console Redirection Submenu

Table 31: Console Redirection submenu

| Feature | Choices or Display Only | Description | Your Setting |
|-----------------------|---|--|--------------|
| BIOS redirection Port | Disabled Serial Port A Serial Port B | Specifies to which serial port the remote console is connected. | |
| ACPI Redirection Port | Disabled Serial Port A Serial Port B | Specifies to which serial port the ACPI console is connected. | |
| Baud Rate | 9.6K 19.2K 36.4K 57.6K 115.2K | Sets the communication speed for the interface with successive remote consoles. | |
| Flow Control | None XON/XOFF CTS/RTS CTS/RTS+CD | Sets the handshake protocol the BIOS should expect from the remote console redirection application | |
| Terminal Type | PC ANSI VT100+ VT-UTF8 | Specifies the remote console type. | |
| Remote Console Reset | Disabled Enabled | Enables or disables the reset command issued by the remote console. | |

Event Log Configuration Submenu

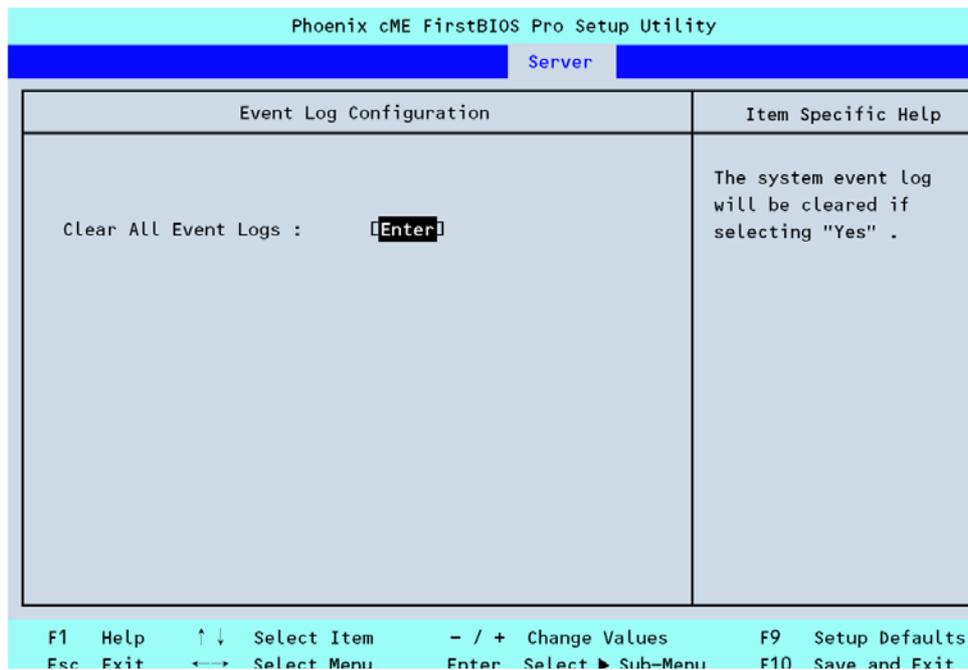


Figure 116: Event Log Configuration Submenu

Table 32: Event Log Configuration submenu

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

Boot Options Menu

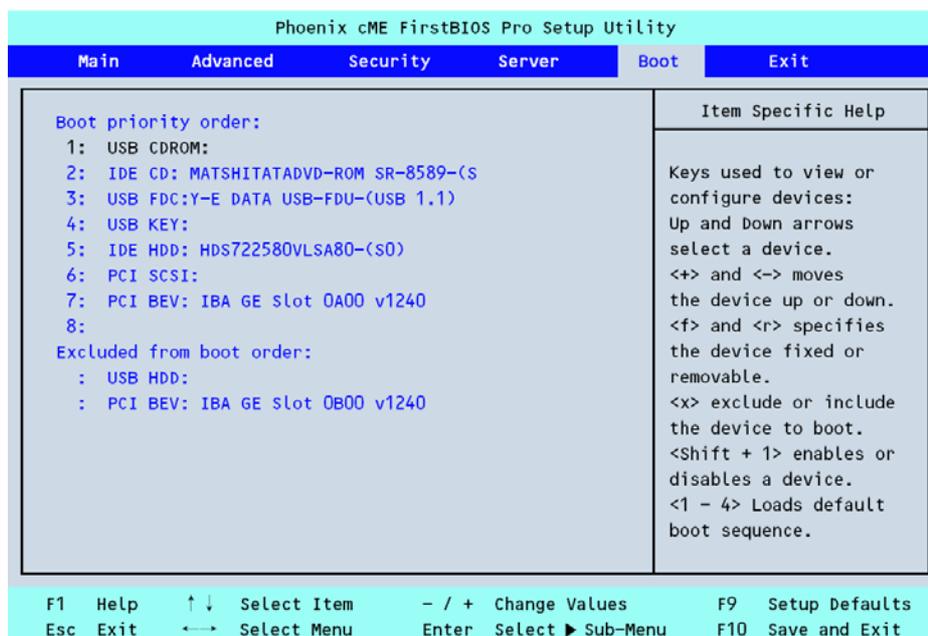


Figure 117: Boot Options Menu

At each boot, the server searches for boot software on the available devices, following the order set in this menu.

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

 **Notes** To boot from the ExpressBuilder disc, set the devices priority as shown in the figure above.

Exit Menu

You can make the following exit selections on the Main Menu. Select an option using the up or down arrow keys, then press <Enter> to execute the option.

You must select one of the items from the menu or menu bar to exit.

Exit Saving Changes

Select this item and press **Enter** to save the settings in the CMOS (nonvolatile memory) and close the Setup Utility. Click **Yes** when prompted to do so. The system reboots automatically.

Exit Discarding Changes

Select this item and press **Enter** to close the Setup Utility without saving the settings in the CMOS (nonvolatile memory). When prompted for confirmation:

- Select **No** to close the Setup Utility without saving the settings.
- Select **Yes** to close the Setup Utility and save the settings in the CMOS (nonvolatile memory).

In both cases, the system reboots automatically.

Load Setup Defaults

Select this item and press **Enter** to return all the settings to the default values set at the factory. When prompted for confirmation:

- Select **Yes** to load the default values.
- Select **No** to return to the *Exit Menu* screen.

Caution

This option resets the [SATA RAID Enabled] option in the [Advanced] - [Peripheral Configuration] menu to [Disabled]. If SATA hard disk drives are installed in your server and if the onboard SATA RAID feature is used, change the [SATA RAID Enabled] parameter from [Disabled] to [Enabled] before exiting BIOS Setup. Leaving this parameter as the factory-set value (Disabled) may destroy the data in hard disk drive.

 **Note:** To display the [SATA RAID Enabled] menu, select [Advanced] - [Peripheral Configuration] - [SATA Controller Mode Option] - [Enhanced].

Load Custom Defaults

Select this item and press **Enter** to load the custom defaults stored. This menu does not appear if the Custom Defaults have not been saved.

Save Custom Defaults

Select this item and press **Enter** to save the actual parameters as custom defaults. Once the parameters are saved, the *Load Custom Defaults* menu appears.

Discard Changes

Select this item and press **Enter** to discard the changes you made to the settings before saving them to the CMOS.

Save Changes

Select this item and press **Enter** to save the settings to the CMOS (non-volatile memory) without closing the Setup Utility.

Updating BIOS

The update utility allows you to update the BIOS stored in the flash memory. The code and data in the update file include the following:

- On-board system BIOS, including the recovery code, BIOS Setup Utility, and strings.
- On-board video BIOS, and other option ROMs for devices embedded on the server board.

Preparing for the Update

The steps below explain how to prepare to update the BIOS, including how to record the current BIOS settings and how to obtain the update utility.

 **Note:** In the unlikely event that a BIOS error occurs during the BIOS update process, a recovery process may need to be followed to return the system to service.

Recording the Current BIOS Settings

1. Boot the computer and press <F2> when you see the message:
Press <F2> Key if you want to run SETUP
2. Write down the current settings in the BIOS Setup program.

 **Note:** Do not skip step 2. You will need these settings to configure your computer at the end of the procedure.

Obtaining the Update

Consult our Web site at the following address: **<http://www.nec-computers.com>** to download the required files (these files may have been zipped for your convenience). Save these files on a floppy disk (unzip them if necessary).

 **Note:** Review the instructions and release notes that are provided in the readme file distributed with the BIOS image file before attempting a BIOS update. The release notes contain critical information regarding jumper settings, specific fixes, or other information to complete the update.

Updating the BIOS

1. Follow the instructions in the readme file that came with the BIOS update. When the update completes, remove the bootable media from which you performed the update.

Caution

Do not power down the system during the BIOS update process! The system will reset automatically when the BIOS update process is completed.

2. Press F2 to enter the BIOS Setup utility.
3. In the BIOS Setup utility, press F9 to load the setup defaults.
4. Press F10 to save the changes and exit the BIOS Setup utility.

How to Identify BIOS Revision Level

To identify your system's current BIOS revision level, perform the following procedure:

1. Power-on or reboot the system.
“Press <F2> to enter SETUP” is displayed.
2. Press **F2**.
3. In the **Main** menu, check the value that appears in the BIOS Version field.

Specifications

Table 33: Bull NovaScale T820 Specifications

| Item | | Description | |
|--|----------------------|--|-------------|
| Cabinet design | | Tower or Rack (with conversion optional kit) | |
| Chipset | | Intel® 3000 | |
| CPU | Type | Intel® Pentium® D Intel® Pentium® Xeon® | |
| | Number of processors | 1 (max: 1) | |
| | Packaging | Socket LGA775 | |
| Memory | Minimum | 512 MB | |
| | Maximum | 8 GB (4x2GB) - the standard DIMM must be replaced | |
| | Connectors | 4 slots | |
| | Memory module | DDR2 667 | |
| | Error check | ECC | |
| Graphics (VRAM) | | Chipset integrated + 2MB | |
| Hard Disk Drive | Technology | S-ATA | SCSI |
| | Number (max) | 250GB x 4 | 146.5GB x 4 |
| External accessible bays | 5.25-inch bay | 3 bays | |
| | 3.5-inch bay | 1 bay | |
| External interface | Keyboard | MINI DIN 6-pin (1 port) | |
| | Mouse | MINI DIN 6-pin (1 port) | |
| | USB | 2.0 (4 ports) | |
| | Serial | D-sub 9-pin (1 port) | |
| | Network | 2 ports (1000BASE-T/100BASE-TX/10BASE-T) 1 port (10/100BASE-TX, for management) | |
| | VGA | MINI D-sub 15-pin (1 port) | |
| External dimensions | | 440 (height) × 309* (width) mm × 518 (depth) * 309 mm with stabilizers, 198 without stabilizers | |
| Weight | | 19 Kg Max | |
| Power supply (depending on your configuration) | | Input voltages 220 to 240 VAC +/- 10%, 50/60Hz +/-1Hz | |
| Power consumption (maximum) | | 232 W | |
| Environmental requirements | Temperature | 10 to 35°C | |
| | Humidity | 20 to 80% RH (no condensation) | |

Internal Cabling

Internal cable connections of the server are shown below.

Adding a Hard Disk Drive

SATA

Connect the cables as shown in the picture below when adding SATA drives. Fill the drive bay from bottom to top.

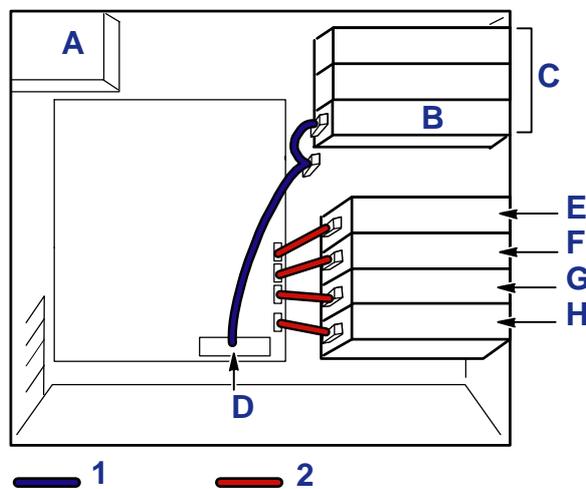


Figure 118: Adding a SATA hard drive

- A: Power supply
- B: Optical disc drive
- C: 5.25-inch device bay
- D: IDE connector
- E: 4th hard drive
- F: 3rd hard drive
- G: 2nd hard drive
- H: 1st drive
- 1: IDE cable
- 2: SATA2 cable

Use additional SATA2 cables to plug the 3rd and 4th hard drives.

When two hard drives are installed in the server, you can configure a disk array. Refer to [“Configuring RAID” on page 78](#) for more information.

Connecting the Disk Array Controller (SATA2)

Refer to [“Configuring RAID” on page 78](#) for more information about the RAID levels and configuration.

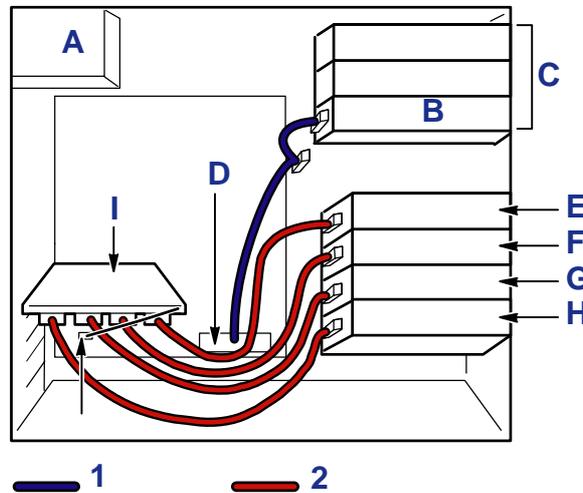


Figure 119: Adding a SATA2 DAC

- A: Power supply
- B: Optical disc drive
- C: 5.25-inch device bay
- D: IDE connector
- E: 4th hard drive
- F: 3rd hard drive
- G: 2nd hard drive
- H: 1st drive
- I: Disk array controller (SATA2) on PCI#1 or #2
- 1: IDE cable
- 2: SATA2 cable

To indicate the access status of the internal hard disk drives, connect the LED cable provided with the server to the LED connector on the motherboard and the disk array controller (SATA II).

You can check the disk status (disk error or rebuilding of disk array) through the disk array management utility, Web-based Promise Array Manager, coming with the disk array controller (SATA II). Refer to [“WebPAM” on page 168](#) for more information.

Connecting the Disk Array Controller (SAS) - LSILogic MegaRAID SAS 8408E

Refer to [“Configuring RAID” on page 78](#) for more information about the RAID levels and configuration.

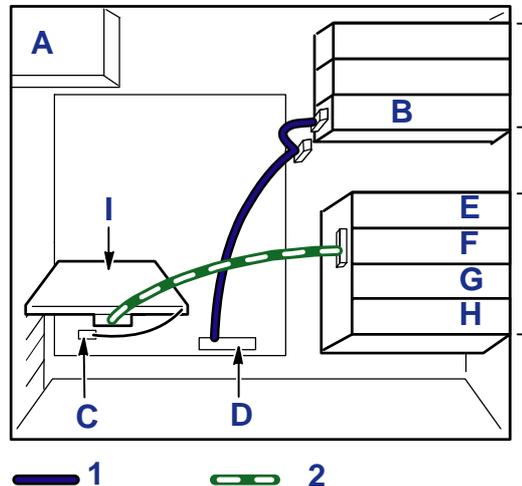


Figure 120: Adding a SAS DAC

- A: Power supply
- B: Optical disc drive
- C: LED connector
- D: IDE connector
- E: 4th hard drive
- F: 3rd hard drive
- G: 2nd hard drive
- H: 1st drive
- I: Disk array controller (SAS)
- 1: IDE cable
- 2: SAS cable

To indicate the access status of the internal hard disk drives, connect the LED cable provided with the server to the LED connector on the motherboard and the disk array controller (SAS).

You can check the disk status (disk error or rebuilding of disk array) through the disk array management utility, MegaRAID Storage Manager, coming with the disk array controller (SAS). Refer to [“RAID Configuration using the MegaRAID Configuration Utility” on page 98](#) for more information.

Connecting a 5.25-inch Device

The 5.25-inch device bay can be equipped with a single device, or a SCSI device or an IDE device such as DVD-RAM.

SCSI Device

Contact your service representative to purchase the SCSI controller and the SCSI cable to be used for the connection.

Set a unique SCSI ID for the SCSI device. Refer to [“Preparing SCSI Devices” on page 149](#) for more information.

If the SCSI cable has a connector to terminate the SCSI connection, make sure the device is set accordingly.

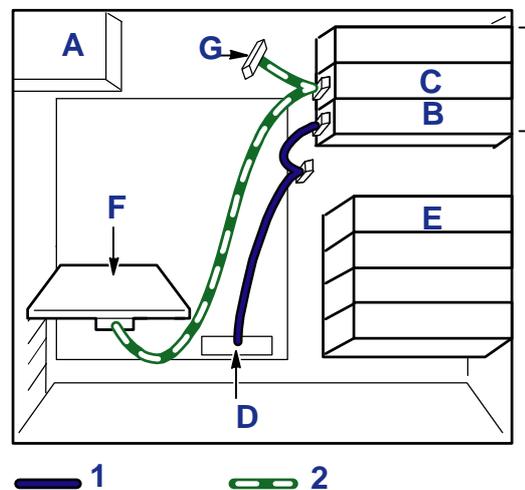


Figure 121: Adding a SCSI device

- A: Power supply
- B: Optical disc drive
- C: SCSI device
- D: IDE connector
- E: Unused
- F: SCSI controller
- G: SCSI terminator
- 1: IDE cable
- 2: SCSI cable

IDE Device

Contact your service representative to purchase the IDE controller and the IDE cable to be used for the connection.

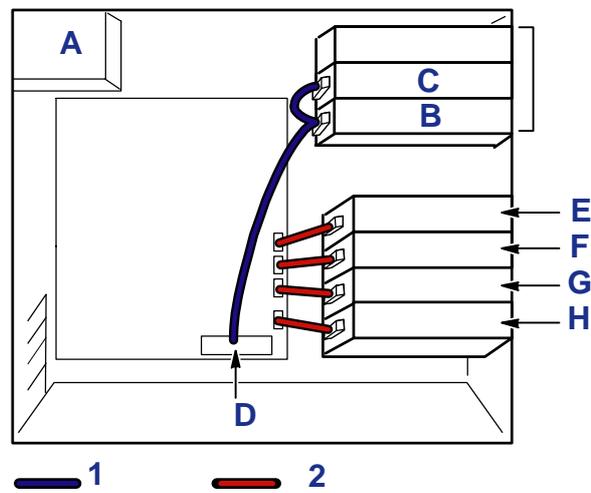


Figure 122: Adding an IDE device

- A: Power supply
- B: IDE device
- C: Optical disc drive
- D: IDE connector
- E: 4th hard drive
- F: 3rd hard drive
- G: 2nd hard drive
- H: 1st drive
- 1: IDE cable
- 2: SATA2 cable

Power Cables

Standard Configuration

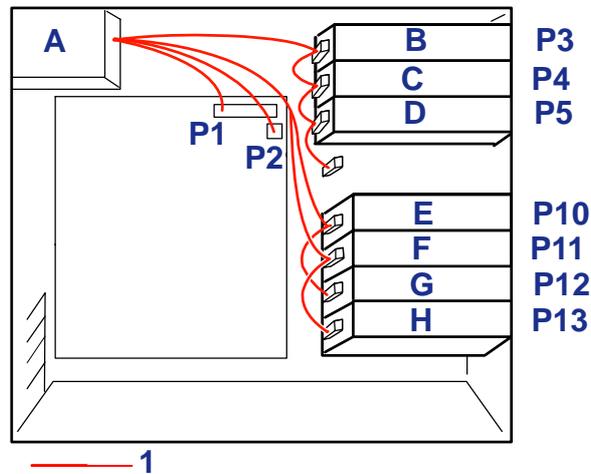


Figure 123: Standard Configuration

- A: Power supply
- B: Option device
- C: Option device
- D: Optical disc drive
- E: 4th hard drive
- F: 3rd hard drive
- G: 2nd hard drive
- H: 1st drive
- 1: Power cable

Additional HDD Cage Connected

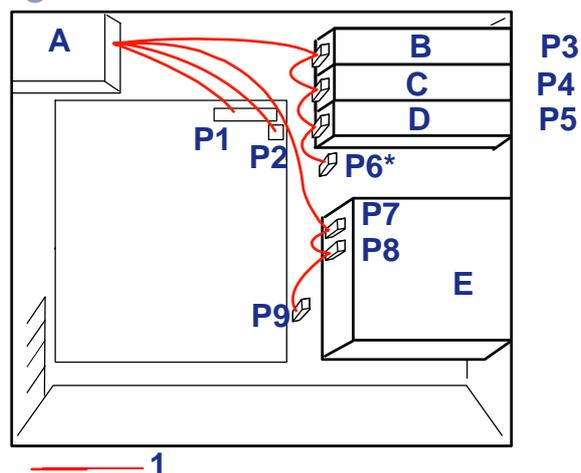


Figure 124: Additional Cage Configuration

- A: Power supply
- B: Option device
- C: Optical disc drive
- D: Option device
- E: Additional cage
- 1: Power cable
- *: unused connector

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 | |
| Memory | | | | | | |
| #1 | Size | | Serial No. | | Date installed | |
| #2 | Size | | Serial No. | | Date installed | |
| #3 | Size | | Serial No. | | Date installed | |
| #4 | Size | | Serial No. | | Date installed | |
| Monitor | | | | | | |
| | Type | | Model name | | Serial No. | |
| | | | | | Date installed | |
| Fixed SCSI Hard Disks | | | | | | |
| ID0 | Type | | Serial No. | | | |
| | Capacity | | | Date installed | | |
| | Type number | | | | | |
| ID1 | Type | | Serial No. | | | |
| | Capacity | | | Date installed | | |
| | Type number | | | | | |
| ID2 | Type | | Serial No. | | | |
| | Capacity | | | Date installed | | |
| | Type number | | | | | |
| Fixed SATA Hard Disks | | | | | | |
| #1 | Type | | Serial No. | | | |
| | Capacity | | | Date installed | | |
| | Type number | | | | | |
| #2 | Type | | Serial No. | | | |
| | Capacity | | | Date installed | | |
| | Type number | | | | | |
| #3 | Type | | Serial No. | | | |
| | Capacity | | | Date installed | | |
| | Type number | | | | | |
| 5.25-inch Device #1 | | | | | | |
| | Size | | Capacity | | Serial No. | |
| | Model name | | Type number | | Date installed | |

| | | | | | | |
|------------------------------|--------------|--|-------------|--|----------------|--|
| 5.25-inch Device #2 | | | | | | |
| | Size | | Capacity | | Serial No. | |
| | Model name | | Type number | | Date installed | |
| PCI Slot #1 | | | | | | |
| | Model name | | | | Serial No. | |
| | | | | | Date installed | |
| PCI Slot #2 | | | | | | |
| | Model name | | | | Serial No. | |
| | | | | | Date installed | |
| PCI Slot #3 | | | | | | |
| | Model name | | | | Serial No. | |
| | | | | | Date installed | |
| PCI Slot #4 | | | | | | |
| | Model name | | | | Serial No. | |
| | | | | | Date installed | |
| PCI Slot #5 | | | | | | |
| | Model name | | | | Serial No. | |
| | | | | | Date installed | |
| AGP Board Slot | | | | | | |
| | Model name | | | | Serial No. | |
| | | | | | Date installed | |
| Printer | | | | | | |
| | Model name | | | | Serial No. | |
| | Manufacturer | | | | Date installed | |
| Additional Cabinet for disks | | | | | | |
| | 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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